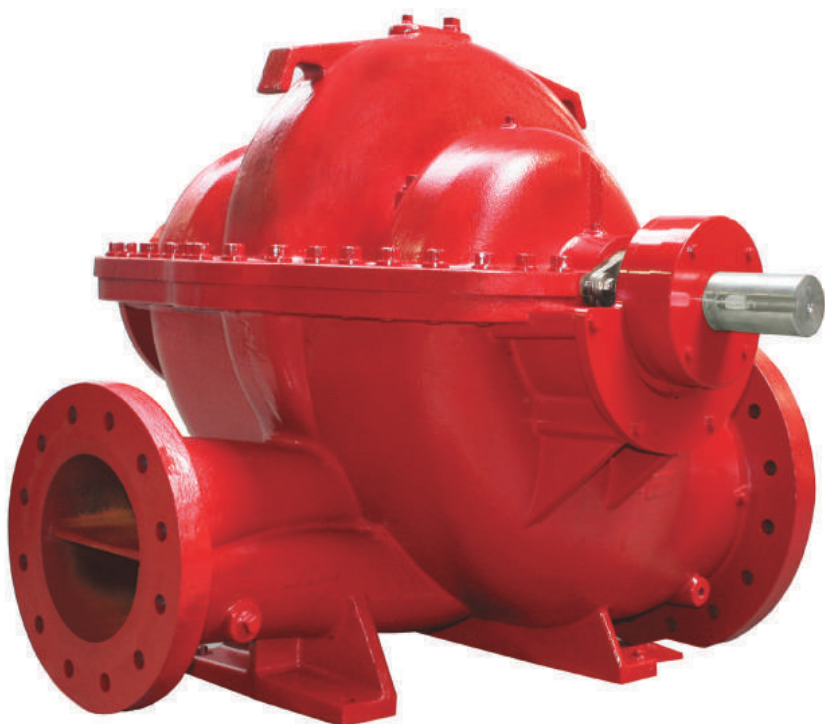
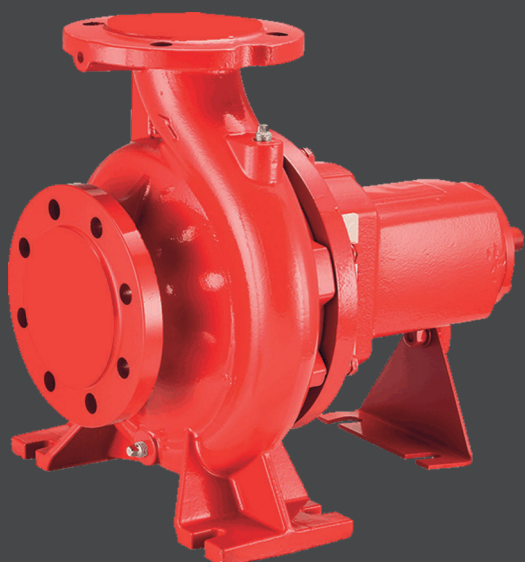


50Hz/60Hz



**MENA**  
MECHANICAL INDUSTRIES CO.

# FIRE PUMP



|                                                                                   |                                                  |  |
|-----------------------------------------------------------------------------------|--------------------------------------------------|--|
|  |                                                  |  |
|                                                                                   | Vendor Doc. No.<br><b>TS-250/9.5-12 - ES2527</b> |  |
| Contractor Name:<br><b>WATER WAVE</b>                                             | Contractor Ref. No                               |  |
| Project Name:                                                                     | Contractor Job No.                               |  |

**Fire Pump Set Technical**

**Capacity**  
**250 GPM @ 9.5 - 12 BAR**  
  
**(E+D+J)**

|            |                               |                 |                |                 |                   |
|------------|-------------------------------|-----------------|----------------|-----------------|-------------------|
|            |                               |                 |                |                 |                   |
|            |                               |                 |                |                 |                   |
|            |                               |                 |                |                 |                   |
|            |                               |                 |                |                 |                   |
| <i>0</i>   | <i>SUBMITTED FOR APPROVAL</i> | <i>KY</i>       | <i>KY</i>      |                 | <i>19/06/2025</i> |
| <i>Rev</i> | <i>Description</i>            | <i>Prepared</i> | <i>Checked</i> | <i>Approved</i> | <i>Date</i>       |



|                                                                                   |                     |  |
|-----------------------------------------------------------------------------------|---------------------|--|
|  | Vendor Ref. No.     |  |
|                                                                                   |                     |  |
|                                                                                   | Contractor Ref. No. |  |
| Project Name:                                                                     | Contractor Job No.  |  |

## DOCUMENT INDEX

| Part                 | Seq. No. | Doc. Ref.     | Description                                               | Remarks |
|----------------------|----------|---------------|-----------------------------------------------------------|---------|
| GENERAL DOCUMENTS    | 01       | GD-SVL        | Sub-Vendor List                                           |         |
|                      | 02       | GD-STC        | System Technical Specifications                           |         |
|                      | 03       | GD-CE         | UL/FM Certificates                                        |         |
|                      | 04       | GD-CP         | Catalogue and Trade License                               |         |
|                      | 05       | GD-PA         | PREVIOUS APPROVAL                                         |         |
| DIESEL DRIVEN PUMP   | 06       | DDP-PSC-250   | Diesel Engine Driven Pump Specifications                  |         |
|                      | 07       | DDP-DES       | Diesel Engine Specifications                              |         |
|                      | 08       | DDP-PCS-12V   | Diesel Engine driven fire pump controller specifications  |         |
|                      |          |               |                                                           |         |
| ELECTRIC DRIVEN PUMP | 09       | EDP-PSC-250   | Electric motor driven pump specifications                 |         |
|                      | 10       | EDP-EMS-100/2 | Electric motor specifications                             |         |
|                      | 11       | EDP-PCS       | Electric motor driven fire pump controller specifications |         |
|                      |          |               |                                                           |         |
| JOCKEY PUMP          | 12       | JP-RV         | Jockey Pump Specifications                                |         |
|                      | 13       | JP-PCS-JP3    | Jockey Pump Controller                                    |         |
| ACCESSORIES          | 14       | A-CRV-R       | Casing Relief Valve                                       |         |
|                      |          | A-PG-W        | Pressure Guages                                           |         |
|                      |          | A-FM-GRND     | Flowmeter                                                 |         |
|                      |          | A-CS-120      | Diesel Fuel Tank Drawing                                  |         |
|                      |          |               |                                                           |         |
|                      |          |               |                                                           |         |
|                      |          |               |                                                           |         |

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

|                                                                                   |                 |                    |
|-----------------------------------------------------------------------------------|-----------------|--------------------|
|  | Vendor Ref. No. |                    |
|                                                                                   |                 |                    |
|                                                                                   |                 | Contractor Ref. No |
| Project Name:                                                                     |                 | Contractor Job No. |

SUB VENDOR LIST

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

## SUB VENDOR LIST

| EQUIPMENT             | BRAND                                                                               | MAKE                                                             | DESCRIPTION                                                                            |
|-----------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| END SUCTION FIRE PUMP |    | MENA MECHANICAL INDUSTRIES, UAE                                  | RANGE: 50 - 1000 US GPM<br>upto 230 PSI                                                |
| DIESEL DRIVER         | TAIDONG                                                                             | TAIDONG<br>UL LISTED                                             | RANGE: 24 - 262 HP<br>from 2920 - 3000 RPM                                             |
| FIRE PUMP MOTOR       | TECHTOP                                                                             | TECHTOP UL LISTED                                                | RANGE: 11kW - 350kW<br>Type: ODP & TEFC, NEMA2                                         |
| FIRE PUMP CONTROLLERS |  | TORNATECH, INC<br>UL LISTED & FM APPROVED                        | RANGE: 11kW to 350KW<br>Type: Diesel, Electric, Jockey                                 |
| AIR RELIEF VALVE      | <b>CAL-VAL</b><br><br>OR <b>FWIC</b> Valves<br>*As Per Availability                 | VAL-MATIC, USA<br>UL LISTED & FM<br>APPROVED FWIC<br>FM APPROVED | RANGE: 1/2 inch - 2<br>inch UP TO 300 PSI<br>RANGE: 1/2 inch - 1<br>inch UP TO 300 PSI |
| FLOWMETER             |  | GERAND, USA<br>FM APPROVED                                       | RANGE: 2-1/2 Inch to 8 Inch<br>UP TO 300 PSI                                           |



|              |  |                     |  |
|--------------|--|---------------------|--|
|              |  | Vendor Ref. No.     |  |
|              |  |                     |  |
|              |  | Contractor Ref. No. |  |
| Project Name |  | Contractor Job No.  |  |

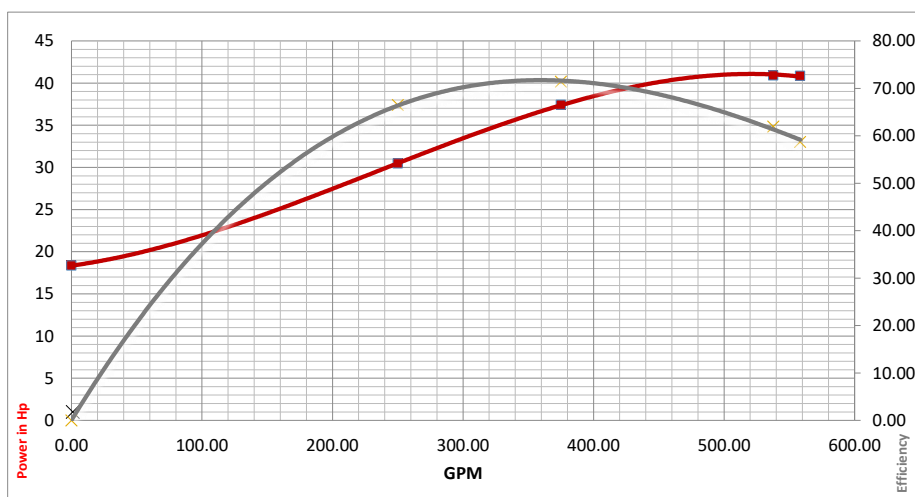
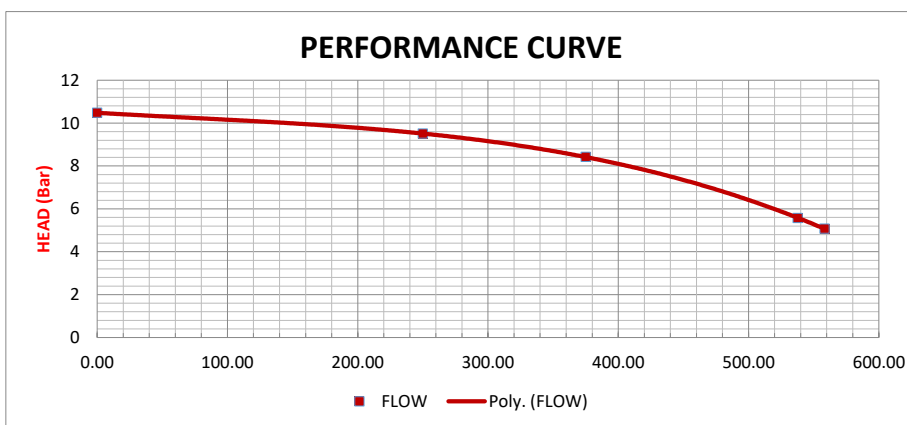
SYSTEM TECHNICAL SUBMITTAL

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

## PUMP PERFORMANCE CURVE

| Pump           |                   | Search Criteria  |                 |
|----------------|-------------------|------------------|-----------------|
| Model          | VES 50-250        | Flow In GPM      | 250             |
| Type           | END SUCTION-50 HZ | Head In (Bar)    | 9.51            |
| Specific Speed | 2980              | Fluid            |                 |
| FL-Dimension   | 3x2               | Fluid            | Water           |
| Motor Rating   |                   | Impeller Details |                 |
| Motor HP       |                   | Atm Pressure     | 101 Mpa         |
|                |                   | Impeller Dia(mm) | Ref Test Report |

| Data Point    |        |
|---------------|--------|
| Flow (GPM)    | 250    |
| Head In (Bar) | 9.51   |
| Eff           | 66.48  |
| BHP@150%      | 37.42  |
| RPM           | 2980   |
| Design Curve  |        |
| Shutoff head  | 10.48  |
| Flow @150%    | 375    |
| H(Bar)@150%   | 8.42   |
| Power-150%    | 37.420 |
| Driver Rating |        |
| Motor (HP)    | NA     |
| Engine(HP)    | 52     |



### Performance Evaluation

| Flow In GPM | Pressure in M(Bar) | Power In Hp | Eifficiency |
|-------------|--------------------|-------------|-------------|
| 0.00        | 10.48              | 18.350      | 0.00        |
| 250.00      | 9.51               | 30.470      | 66.48       |
| 375.00      | 8.42               | 37.420      | 71.42       |
| 537.72      | 5.57               | 40.900      | 61.93       |
| 558.38      | 5.08               | 40.87       | 58.70       |

\*Manufacturer Reserves Right to Revise the specs and contains without prior notice

|                   |          |             |      |     |                             |
|-------------------|----------|-------------|------|-----|-----------------------------|
| Performance Curve | original | Engineering | copy | N/A | DOC PCE-VES 50-250-250-9.51 |
|-------------------|----------|-------------|------|-----|-----------------------------|

## Diesel Fire Pump

### Item Description

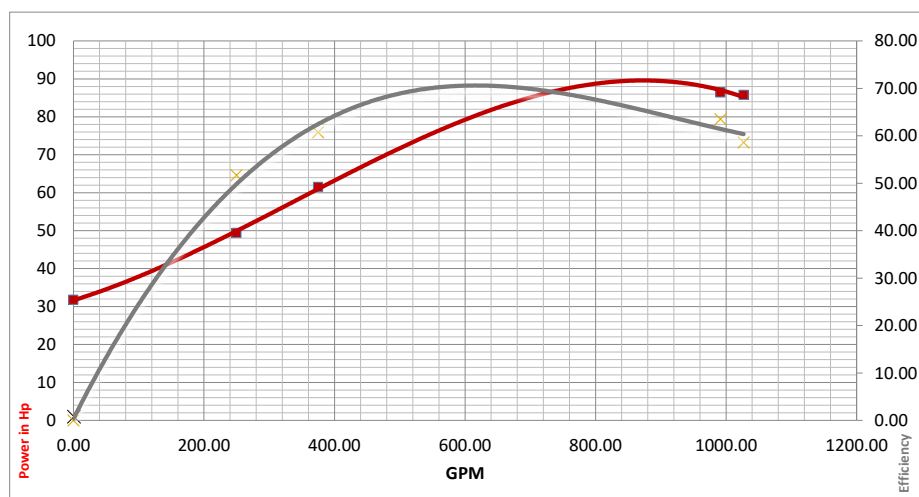
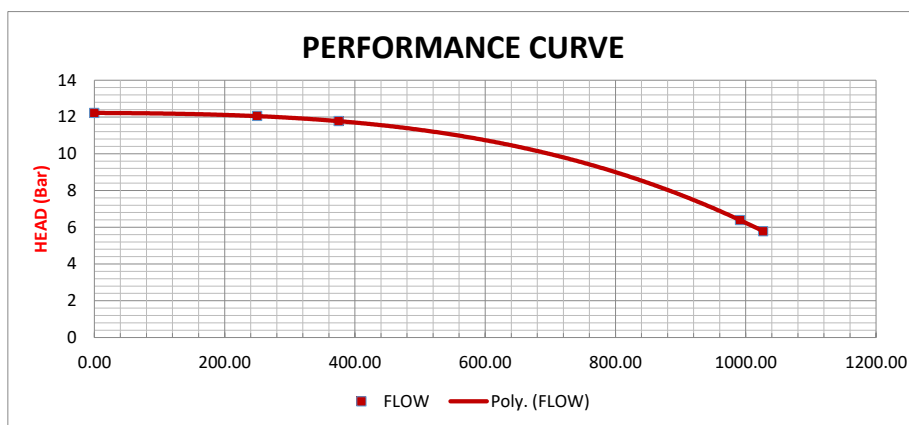
### Proposed

| <b><u>Diesel Pump:</u></b>           |                                                                                                                                                                                                                                |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Make                                 | : MENA (MENA Mechanical Industries) UL Listed                                                                                                                                                                                  |
| Model                                | : VES 50-250                                                                                                                                                                                                                   |
| Type                                 | : End Suction Fire Pump                                                                                                                                                                                                        |
| Rated Flow                           | : 250 USGPM                                                                                                                                                                                                                    |
| Rated Head                           | : 9.5 BAR                                                                                                                                                                                                                      |
| Rated Speed                          | : 2980 RPM                                                                                                                                                                                                                     |
| Casing                               | : Ductile Iron                                                                                                                                                                                                                 |
| Impeller                             | : Bronze                                                                                                                                                                                                                       |
| Material Shaft                       | : ASTM 420                                                                                                                                                                                                                     |
| Brand                                | :                                                                                                                                             |
| Pump Approval                        | : UL Listed                                                                                                                                  |
| <b><u>Diesel Engine:</u></b>         |                                                                                                                                                                                                                                |
| Make                                 | : TAIDONG                                                                                                                                                                                                                      |
| Model / Hp                           | : 490HE / 52 HP                                                                                                                                                                                                                |
| Cooling Method                       | : Heat Exchanger                                                                                                                                                                                                               |
| Speed                                | : 3000 RPM                                                                                                                                                                                                                     |
| Engine Approval                      | : UL Listed & FM Approved                            |
| <b><u>Diesel Pump Controller</u></b> |                                                                                                                                                                                                                                |
| Make                                 | : "Tornatech",                                                                                                                            |
| Model                                | : GPD-24-220                                                                                                                                                                                                                   |
| Operation                            | : Combined Automatic , Manual Start                                                                                                                                                                                            |
| Enclosure                            | : NEMA 2                                                                                                                                                                                                                       |
| Mounting                             | : FLOOR / WALL                                                                                                                                                                                                                 |
| Method of Start                      | : Standard                                                                                                                                                                                                                     |
| Operation Interface                  | : Standard                                                                                                                                                                                                                     |
| Power Supply                         | : 220V AC, 24V DC                                                                                                                                                                                                              |
| Controller Approval                  | : UL Listed & FM Approved, Built to NFPA 20 Standards   |

## PUMP PERFORMANCE CURVE

| Pump           |                   | Search Criteria  |                 |
|----------------|-------------------|------------------|-----------------|
| Model          | VES 65-250        | Flow In GPM      | 250             |
| Type           | END SUCTION-60 HZ | Head In (Bar)    | 12.06           |
| Specific Speed | 3500              | Fluid            |                 |
| FL-Dimension   | 4-2 1/2           | Fluid            | Water           |
| Motor Rating   |                   | Impeller Details |                 |
| Motor HP       |                   | Atm Pressure     | 101 Mpa         |
|                |                   | Impeller Dia(mm) | Ref Test Report |

| Data Point    |        |
|---------------|--------|
| Flow (GPM)    | 250    |
| Head In (Bar) | 12.06  |
| Eff           | 51.67  |
| MAX HP(EOC)   | 86.41  |
| RPM           | 3500   |
| Design Curve  |        |
| Shutoff head  | 12.22  |
| Flow @150%    | 375    |
| H(Bar)@150%   | 11.77  |
| Power-150%    | 61.530 |
| Driver Rating |        |
| Motor (HP)    | 100    |
| Engine(HP)    | NA     |



### Performance Evaluation

| Flow In GPM | Pressure in M(Bar) | Power In Hp | Eifficiency |
|-------------|--------------------|-------------|-------------|
| 0.00        | 12.22              | 31.760      | 0.00        |
| 250.00      | 12.05              | 49.360      | 51.67       |
| 375.00      | 11.77              | 61.530      | 60.73       |
| 991.39      | 6.39               | 86.420      | 63.50       |
| 1026.83     | 5.78               | 85.77       | 58.58       |

\*Manufacturer Reserves Right to Revise the specs and contains without prior notice

|                   |          |             |      |     |                              |
|-------------------|----------|-------------|------|-----|------------------------------|
| Performance Curve | original | Engineering | copy | N/A | DOC PCE-VES 65-250-250-12.06 |
|-------------------|----------|-------------|------|-----|------------------------------|

## Electric Fire Pump

### Item Description

### Proposed

| <b><u>Electric Pump:</u></b>           |                                                                                                                                                                                                                                 |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Make                                   | : MENA (MENA Mechanical Industries) UL Listed                                                                                                                                                                                   |
| Model                                  | : VES 65-250                                                                                                                                                                                                                    |
| Type                                   | : End Suction Fire Pump                                                                                                                                                                                                         |
| Rated Flow                             | : 250 USGPM                                                                                                                                                                                                                     |
| Rated Head                             | : 12 BAR                                                                                                                                                                                                                        |
| Rated Speed                            | : 3500 RPM                                                                                                                                                                                                                      |
| Casing                                 | : Ductile Iron                                                                                                                                                                                                                  |
| Impeller Material                      | : Bronze                                                                                                                                                                                                                        |
| Shaft                                  | : ASTM 420                                                                                                                                                                                                                      |
| Brand                                  | : MENA                                                                                                                                                                                                                          |
| Pump Approval                          | : UL Listed                                                                                                                                    |
| <b><u>Electric Motor:</u></b>          |                                                                                                                                                                                                                                 |
| Make                                   | : TECHTOP                                                                                                                                                                                                                       |
| Protection                             | : Class F                                                                                                                                                                                                                       |
| Type                                   | : ODP                                                                                                                                                                                                                           |
| Performance Rating                     | : 100 HP, 3Ph, 60Hz , 380V, 2 POLES                                                                                                                                                                                             |
| Speed                                  | : 3500 - 3600 RPM                                                                                                                                                                                                               |
| Motor Approval                         | : UL Listed                                                                                                                                  |
| <b><u>Electric Pump Controller</u></b> |                                                                                                                                                                                                                                 |
| Make                                   | : "Tornatech"                                                                                                                              |
| Model                                  | : GPY-380\100\3\60                                                                                                                                                                                                              |
| Operation                              | : Combined Automatic , Manual Start & Remote Start                                                                                                                                                                              |
| Enclosure                              | : NEMA 2                                                                                                                                                                                                                        |
| Mounting                               | : FLOOR / WALL                                                                                                                                                                                                                  |
| Method of Start                        | : WYE DELTA                                                                                                                                                                                                                     |
| Operation Interface                    | : Standard                                                                                                                                                                                                                      |
| Power Supply                           | : 3Ph, 380V, 60Hz                                                                                                                                                                                                               |
| Controller Approval                    | : UL Listed & FM Approved, Built to NFPA 20 Standards   |



## Jokey Fire Pump

### Item Description

### Proposed

| <b><u>Electric Pump:</u></b>         |                                                                                                                              |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Make                                 | : PACIFIC OR MENA Pumps AS PER AVAILABILITY                                                                                  |
| Model                                | : RV                                                                                                                         |
| Type                                 | : Vertical Multistage                                                                                                        |
| Rated Flow                           | : 25 USGPM                                                                                                                   |
| Rated Head                           | : 13 BAR                                                                                                                     |
| Rated Speed                          | : 3500 RPM, 60 Hz                                                                                                            |
| <b><u>Motor:</u></b>                 |                                                                                                                              |
| Type                                 | : TEFC Motor                                                                                                                 |
| Power Supply                         | : 3 Ph, 380V, 60 hz                                                                                                          |
| Rated power                          | : 5.5 Hp                                                                                                                     |
| Speed                                | : 3500RPM                                                                                                                    |
| <b><u>Jockey Pump Controller</u></b> |                                                                                                                              |
| Make                                 | : "Tornatech"                           |
| Model                                | : JP3-380\7.5\3\60                                                                                                           |
| Operation                            | : Combined Automatic , Manual Start                                                                                          |
| Enclosure                            | : NEMA 2                                                                                                                     |
| Mounting                             | : WALL                                                                                                                       |
| Method of Start                      | : DOL                                                                                                                        |
| Operation Interface                  | : Touch Screen                                                                                                               |
| Power Supply                         | : 3 Phase, 380 V, 60 Hz                                                                                                      |
| Controller Approval                  | : UL Listed / Built to NFPA 20 Standards  |

|                                                                                   |                     |  |
|-----------------------------------------------------------------------------------|---------------------|--|
|  | Vendor Ref. No.     |  |
|                                                                                   |                     |  |
|                                                                                   | Contractor Ref. No. |  |
| Project Name:                                                                     | Contractor Job No.  |  |

PREVIOUS APPROVALS

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

التاريخ: 2023/10/19  
الرقم: ME/LE/2023/C0106

### خطاب

بموجب هذا نحن شركة ميناء للصناعات الميكانيكية (شركة اماراتية بموجب رخصة تجارية رقم 763789) ، نؤكد ان مؤسسة موج الماء المضخات للتجارة (شركة سعودية بموجب رخصة تجارية رقم 43069093569) هي وكيل تجاري / موزع في المملكة العربية السعودية ولديها الصلاحيات بالتقديم للحصول على الاعتمادات من الاستشاريين ، كما انها مسؤولة عن خدمات الفحص وما بعد البيع لمضخات اطفاء الحريق ذات العلامة التجارية – MENA.

المدير العام

شركة ميناء للصناعات الميكانيكية



# Material Submittal Form

TRS-CN-FRM-0018



## General Information

|                 |                             |                                           |           |
|-----------------|-----------------------------|-------------------------------------------|-----------|
| Contractor      | Coastal Contracting Company | Submittal No.                             | 012       |
| Contract No.    | CC3000-CCC                  | Date                                      | 27-Jan-24 |
| To the Engineer | Electrical Engineer         | Approved Subcontractor<br>(as applicable) |           |

## Material Information

|                                                  |                        |                    |     |
|--------------------------------------------------|------------------------|--------------------|-----|
| Material Description<br>(One item only per Form) | Fire Fighting Pump Set |                    |     |
| As per Specification                             | Proposed               | Alternative        | YES |
| Drawing Reference                                |                        | BOQ Ref. No.       | NA  |
| Specification Reference                          | NA                     | Standards, BS, DIN | -   |

## Manufacturer/Supplier

|                                             |                                               |                                    |    |
|---------------------------------------------|-----------------------------------------------|------------------------------------|----|
| Company Name                                | Mena Mechanical Industries Co.                | Locally Manufactured               | NA |
| Address                                     | 601-Shaheel 1 - Nahda 1- United Arab Emirates |                                    |    |
| Local Agent                                 | Water Wave Pump Trading EST.                  | Other Details                      | NA |
| Program Date<br>(Material Required on Site) |                                               | Expected Arrival Date<br>(on Site) |    |

## Contractor's

Mahmoud Alshebli  
Name

Signature

31-Jan-24  
Date

## Design Consultant - Comments

Comments: **Submit:**  
**Test Certificate**

Ahmed Senan  
Name



Date

## Engineer's - Comments

Comments:

Name

Signature

Date

## Status Code

- ☐ Accepted
 ☒ Accepted with Comments
 ☐ Revise and Resubmit
 ☐ Rejected
 ☐ Review not Required



# SUBMITTAL REQUEST طلب اعتماد

|                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRE. DATE:</b> التاريخ التقديم: <b>DATE: 17/05/2023</b>                                                                                                                                                                                                      | <b>NO.</b> رقم الاعتماد:                                                                                                                                                                         |
| <b>CONTRACTOR</b> المقاول: <div style="display: flex; align-items: center; justify-content: center;"> <div>           MASADER PLUS LTD.<br/>           MEP – LC<br/>           Tabuk, KSA         </div> </div>                                                 | <b>CLIENT</b> المالك: <div style="display: flex; align-items: center; justify-content: center;"> <div>           Saudi Air Navigation Services,<br/>           Jeddah, KSA         </div> </div> |
| <b>CONSALTANT</b> الاستشاري: <div style="display: flex; align-items: center; justify-content: center;"> <div>           MOHAMMED FAHD ALSAUD<br/>           ARCHITECTURE<br/>           CONSULTANTS<br/>           3690, Jeddah 21481 KSA         </div> </div> |                                                                                                                                                                                                  |

|                                                                         |                                     |          |               |
|-------------------------------------------------------------------------|-------------------------------------|----------|---------------|
| <b>PROJECT: KKIA FIRE PROTECTION (ATCT, ACC &amp; TSC)</b> اسم المشروع: |                                     |          |               |
| ARCH                                                                    | <input type="checkbox"/>            | معماري   | Design Drwgs. |
| STR                                                                     | <input type="checkbox"/>            | إنشائي   | Shop Drwgs.   |
| ELEC                                                                    | <input type="checkbox"/>            | كهرباء   | Materials     |
| MECH                                                                    | <input checked="" type="checkbox"/> | ميكانيكا | Specs/Data    |
| Other                                                                   | <input type="checkbox"/>            | أخرى     | Other         |

| بند رقم  | وصف البند للإعتماد                   | رقم المبني | كتالوج الصانع أو مخططات المقاول | رقم المواصفات الفنية | عدد النسخ     |
|----------|--------------------------------------|------------|---------------------------------|----------------------|---------------|
| ITEM NO. | DESCRIPTION OF ITEM                  | BLDG. NO.  | MFG.CAT. OR CONTR. DRAWING NO.  | SPEC. REF.           | NO. OF COPIES |
| 1        | FIRE FIGHTING PUMP 1000 gpm & 16 bar | ATCT       | MENA Fire Pumps                 |                      | 1             |
| 2        | FIRE FIGHTING PUMP 500 gpm & 8 bar   | ACC        | MENA Fire Pumps                 |                      | 1             |

|                     |                                                            |
|---------------------|------------------------------------------------------------|
| SIGNATURE: التوقيع: | CONSULTANT RECEIVED ON NAME: تاريخ استلام الاعتماد: الاسم: |
|---------------------|------------------------------------------------------------|

REMARKS: الملاحظات:

Control panel for both fire pumps should operate to work on 55 degree temprature

500 GPM pump should operate delta star not DOL , Jocky pump for ATCT should starting methos ( Delta star ) not DOL

BATTERIES sholud not less than 2022 production

Contractor should arrange with supplier a bout diesel pump heater and all required wires connection to pump

For ACC building , IP control panels should not less than IP55 beause it is outdoor installation

|          |               |                 |
|----------|---------------|-----------------|
| التاريخ: | مدير المشروع: | المهندس المختص: |
|----------|---------------|-----------------|

COMMENTS: الملاحظات:

|                        |                                           |                                                                                                                                                                                                                                                                                        |
|------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Engr. (SANS)   | مهندس المشروع المالك: التاريخ: 23.12.2023 | <input type="checkbox"/> Approved معتمدة<br><input type="checkbox"/> Approved except as noted معتمدة مع ملاحظات<br><input type="checkbox"/> Resubmit as noted بعد التقديم بعد التعديل مرفوضة<br><input type="checkbox"/> Disapproved للعلم<br><input type="checkbox"/> For Information |
| Project Manager (SANS) | مدير المشروع المالك:                      |                                                                                                                                                                                                                                                                                        |

|                     |                                                            |
|---------------------|------------------------------------------------------------|
| SIGNATURE: التوقيع: | CONTRACTOR RECEIVED ON NAME: استلام المقاول بتاريخ: الاسم: |
|---------------------|------------------------------------------------------------|

-Diesel tank volume & dimension to be specified in the submittal.

-Selection is based on actual hydraulic calculation , any lack of coordination is the contractor responsibility.

-Refer to Electrical Comments.

-Installation drawing for main and diesel pumps including any missed accessories should have been presented from the supplier

-Capable of furnishing not less than 150 percent of rated capacity at not less than 65 percent of total rated head. Shutoff head is limited to 140 percent of total rated head.

-Flow measurement systems components to be match with project pressure ratings.

محمد فهد السعوي

للاستشارات الهندسية  
 MOHAMMED F. ALSAUD CONSULTANT  
 4030250538  
 رقم الترخيص: 5110003976

**DUKAN WAREHOUSE  
AL KHUMRAH - JEDDAH**

| S. No. | Materials                                                                                                                    | Listings | Approved / Acceptable Brands    | Remarks                                  |
|--------|------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------|------------------------------------------|
| 1      | Black Steel Sch#40 Pipes                                                                                                     | SASO     | SSP / Sumitomo / Jazira         | require sample for GMC Sch#40, ERW pipes |
| 2      | Grooved Fittings                                                                                                             | UL / FM  | Victaulic / Gruvlok / Shurjoint | require sample for LEDE groove fittings  |
| 3      | Threaded Fittings                                                                                                            | SASO     | Gourd Hitachi                   |                                          |
| 4      | Alarm Check Valves, OS&Y Gate Valves, Gear Operated Butterfly Valves, Swing Check Valves, Strainer, Zone Drain & Test Valves | UL / FM  | Victaulic / Gruvlok / Tyco      |                                          |
| 5      | Automatic Air Vents                                                                                                          | UL / FM  | Claval                          |                                          |
| 6      | Sprinklers                                                                                                                   | UL / FM  | Victaulic / Viking / Gem / Tyco |                                          |
| 7      | Fire Extinguishers                                                                                                           | SASO     | Sffeco                          |                                          |
| 8      | Fire Hose Cabinets                                                                                                           | SASO     | Sffeco                          |                                          |
| 9      | Fire Department Siamese Connection                                                                                           | UL / FM  | Potter / Giacomini              |                                          |
| 10     | Flow Switches                                                                                                                | UL / FM  | Potter                          |                                          |
| 11     | Aerosol System                                                                                                               | UL / FM  | STAT-X                          |                                          |
| 12     | Detection / alarm and Agent Release panel for Aerosol System                                                                 | UL / FM  | Potter                          |                                          |
| 13     | Fire & Jockey Pumps                                                                                                          | UL / FM  | Mena                            |                                          |
| 14     | Fire & Jockey Pump's Panels                                                                                                  | UL / FM  | TornaTech                       |                                          |
| 15     | Flow Meter                                                                                                                   | UL / FM  | Gerand                          |                                          |
| 16     | Pilot Operated Relief Valve for Diesel Pump                                                                                  | UL / FM  | Claval                          |                                          |
| 17     | Emergency Lights (minimum 3 hours backup)                                                                                    | SASO     | Vielux                          |                                          |
| 18     | Fire Alarm System                                                                                                            | UL / FM  | Simples / Context               |                                          |
| 19     | Fire Doors                                                                                                                   | SASO     | Sffeco                          |                                          |
| 20     | Pressure Gauges                                                                                                              | UL / FM  | WIKAI                           |                                          |
| 21     | Hangers / Supports / Threaded Rods                                                                                           | UL / FM  |                                 | require sample for submitted brand       |
|        |                                                                                                                              |          |                                 |                                          |
|        |                                                                                                                              |          |                                 |                                          |
|        |                                                                                                                              |          |                                 |                                          |





|                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CONSULTANT</b><br><br>أحمد الراشد الحميد<br>استشارات هندسية<br>AHMAD AL RASHID AL HUMAID<br>CONSULTING ENGINEERS                                                                                                                                                            | <b>OWNER</b><br><br>مخزن<br>Makhzan                                                                                                                                                                                                                                                                                                                        | <b>CONTRACTOR</b><br><br>FPC<br>FIRST PERIOD COMPANY                                                                                                                                                                                                                                                                                                                                                         |
| <b>PROJECT NAME: MAKHZAN 3</b>                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>MATERIAL SUBMITTAL</b>                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> <b>New Submittal</b> Submittal No: <b>MS- MECH -07</b> Rev.: 01 Submittal Date: <b>28/08/2024</b>                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input checked="" type="checkbox"/> <b>Resubmittal</b> Previous Sub No: <b>MS- MECH -07</b> Previous Submittal Date: <b>30/07/2024</b>                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>DISCIPLINE</b> <input type="checkbox"/> GENERAL <input type="checkbox"/> STRUCTURAL <input checked="" type="checkbox"/> MECHANICAL <input type="checkbox"/> ARCHITECTURAL <input type="checkbox"/> ELECTRICAL                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Drawing Ref. No:00                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                              | B.O.Q Ref. No:12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Specification Ref.:                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                              | Standards:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>MANUFACTURER</b>                                                                                                                                                                                                                                                                                                                                             | <b>SUPPLIER/LOCAL AGENT</b>                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>ORIGIN</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MENA</b>                                                                                                                                                                                                                                                                                                                                                     | <b>MENA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>SAUDI</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>DESCRIPTION</b><br><b>FIREFIGHTING - FIRS PUMP SET<br/>1500 GPM &amp; 10 BAR</b>                                                                                                                                                                                                                                                                             | <b>ATTACHEMENTS:</b><br>TECH. BROCHURE <input checked="" type="checkbox"/><br>CERTIFICATE <input type="checkbox"/><br>MANUFACTURER SPECS/DIR. <input type="checkbox"/><br>METHOD STATEMENT <input type="checkbox"/><br>SAMPLES <input type="checkbox"/><br>O&M MANUALS <input type="checkbox"/><br>SPARE PART LIST <input type="checkbox"/><br>WARRANTY <input type="checkbox"/><br>OTHERS <input type="checkbox"/><br>If any others specify | <b>DETAILS:</b><br>Local Manufactured <input type="checkbox"/><br>G.C. Manufactured <input type="checkbox"/><br>Production Period <input type="checkbox"/><br>Overland Freight <input type="checkbox"/><br>Sea Freight <input type="checkbox"/><br>Total Freight <input type="checkbox"/><br>Total Delivery Time <input type="checkbox"/><br>Planned Delivery Date <input type="checkbox"/><br><br><input checked="" type="checkbox"/> As Specification<br><input type="checkbox"/> Alternative |
| <b>Required Material Date On Site:</b>                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Expected Arrival Date On site:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Contractor's Engineer :</b><br>Name:<br>Signature:<br>Date:                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Contractor's Project Manager:</b><br>Name: <b>AHMED FAIZY</b><br>Signature: <br>Date: 28/08/2024                                                                                                                                                                                                                                                                                                        |
| <b>CONSULTANT'S COMMENTS</b>                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> <b>A Approved</b> <input checked="" type="checkbox"/> <b>B Approved as Noted</b> <input type="checkbox"/> <b>C Revise and Resubmit</b> <input type="checkbox"/> <b>D Rejected</b> <input type="checkbox"/> <b>E No Action</b>                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Architect/Engineer's review is aimed at ensuring general compliance with the design intent and contractual documents. Markings or comments do not absolve the Contractor/Subcontractor from adhering to the project plans and specifications, nor from any deviations. The Contractor/Subcontractor retains responsibility for the details and accuracy.</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Depending on Last Approved Civil defense Data and Concept design:<br>1- The Submittal is approved with notes – Contractor has to submit Origin, and Test certificates.<br>2- Contractor Has to instruct P.O to estimate Manufacturing and Supply Period.<br>3- Contractor Has to submit S.D with DEEP DETAILS & Sections to every part of PUMP ROOM.            |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>CONSULTANT ENGINEER:</b><br><input type="checkbox"/> Arch/Civil <input checked="" type="checkbox"/> Electrical / Mechanical<br>Name: Ahmad Alsherbiny<br>Signature: <br>Date: 14/10/2024                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>CLIENT REPRESENTATIVE</b><br>Name:<br>Signature:<br>Date:                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| REF. IN                                                                                                                                                                                                                                                                                                                                                         | Signature:<br>Date:                                                                                                                                                                                                                                                                                                                                                                                                                          | REF. OUT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                              | Signature:<br>Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |



## Material Submittal

|            |                               |                                  |
|------------|-------------------------------|----------------------------------|
| OWNER      | : AL MOUSA HEALTH GROUP       |                                  |
| CONSULTANT | : --                          | Document No. : AZ-PHC-MAT-ME-009 |
| CONTRACTOR | : AL BADEEL CONTRACTING       | Date : 13-3-2025                 |
| PROJECT    | : AZIZIYA PRIMARY HEALTH CARE | Project No. : PHC                |
| LOCATION   | : Al Khobar                   |                                  |

|           |                             |               |       |             |     |
|-----------|-----------------------------|---------------|-------|-------------|-----|
| Project   | AZIZIYA PRIMARY HEALTH CARE | Submittal No. | REV00 | Ref. Spec's | 3.3 |
| Ref. Dwg. | ----                        | Date          |       |             |     |

**Description:** (Manufacturer, Model No, Type, Size, Color Etc.)

## Fire Pump (MENA)

☒ Catalogue
 ☐ Drawing
 ☒ Sample
 ☐ Certificate
 ☐ Others

Having Checked this submittal, we certify it conforms to the requirements  
Of the contract Documents in all respects, except as otherwise indicated herein

Contractor: Eng. Karim Mahmoud

Signature: K.M

Date: 13-3-2025

### ACTION

- ☐ Approved (A)  
☒ Approved As Noted (B)  
☐ Resubmittal Required (C)  
☐ Not Approved (D)

### Remarks/Comments

approved subject to : attached calculation for final selection approval  
 final approval after cevile defence approval

| Profession                | Name | Signature | Review Date |
|---------------------------|------|-----------|-------------|
| Site Manager              |      |           |             |
| Civil/Structural Engineer |      |           |             |
| Architect                 |      |           |             |
| Electrical Engineer       |      |           |             |
| Mechanical Engineer       |      |           |             |

13-03-25  
 Karim

## Mohamed Sayed

**From:** sherif.azab@madar-eng.com  
**Sent:** Monday, August 21, 2023 11:54 AM  
**To:** 'nbajudah@mina.com.sa'  
**Cc:** ahaddad@mina.com.sa; dr.ahmed@madar-eng.com; mohamed.sayed@madar-eng.com  
**Subject:** اعتماد ظلمة الحريق الرئيسية - أبراج منى

المحترمين  
المحترم

السادة / شركة منى العقارية  
عناية / المهندس نبيل باجودة  
تحية طيبة وبعد .....

بمراجعة الكتالوج المرسل من طرفكم الخاص بظلمة الحريق الرئيسية ماركة MENA نفيدكم بالاتي:

- تم اعتماد المضخات موديل VT150-265 قدرة 750 جالون / دقيقة ومعدل ضغط 17 بار.
- الاعتماد شامل المضخات والمحركات ولوحات التحكم والمحابس.
- الاعتماد طبقا للشهادات المقدمة من ال UL وال FM.
- يلزم على المصنع تقديم شهادة الانشاء للمضخة وكذلك شهادة الاستيراد كون بلد المنشأ غير المملكة العربية السعودية.
- يرجى التنبيه على المصنع ان يكون طول الغاطس ( ال SUMP DEPTH ) مطابق لعمق الخزان.
- تركيب الغرفة يكون طبقا للمخططات المعتمدة و NFPA.

Technical Submittal

<https://drive.google.com/file/d/100nDm2AvDh-R3Ov8AfbCJlRMFaLkklCx/view?usp=sharing>

Kind regards,



Sherif Azab,CFPS

Team Leader

+966563692585 | [www.madar-eng.com](http://www.madar-eng.com) | [sherif.azab@madar-eng.com](mailto:sherif.azab@madar-eng.com)

7<sup>th</sup> floor-Msharek tower-3<sup>rd</sup> ring road-Makkah



### Checklist for Testing Fire Set-Pump Name / Electric – Diesel - Jockey

|                    |                                |
|--------------------|--------------------------------|
| Project:           | Bandar Hamadeh for Contracting |
| Installation site: | Makkah Aziziya                 |
| Date of Start-Up   | 17/12/2023                     |

#### KSB/Duplex Submersible Pump Set

|                             |                            |
|-----------------------------|----------------------------|
| <b>Performance data:</b>    |                            |
| Pump Brand and Manufacture: | Pump Name/Origin           |
| Pump Set Type:              | Fire Fighting Pumps Set    |
| Number of Pumps:            | Electric – Diesel - Jockey |
| Set Location:               | Fire Set Room              |

|                                                                          |         |
|--------------------------------------------------------------------------|---------|
| <b>Condition inspection:</b>                                             |         |
| Visual inspection of condition, impermeability and pressure gauge levels | Checked |
| Inspection of any leak in the fire set                                   | Checked |
| inspection of control efficiency and smooth operation of pumps           | Checked |
| Inspection / access to the installation room                             | Checked |
| Inspection of condition of installation area                             | Checked |

|                        |      |
|------------------------|------|
| <b>Operating mode:</b> |      |
| Pump One (Electric)    | AUTO |
| Pump Two (Diesel)      | AUTO |
| Pump Three (Jockey)    | AUTO |

|                                                 |                                   |
|-------------------------------------------------|-----------------------------------|
| <b>Fire set activation / Pressure Set point</b> |                                   |
| Electric Pump                                   | Cut in: 160 Psi/ Cut out: 232 Psi |
| Diesel Pump                                     | Cut in: 150 Psi/ Cut out: 232 Psi |
| Jockey Pump                                     | Cut in: 190 Psi/ Cut out: 290 Psi |
| Voltage(V)                                      | 385 – 390 VOLT                    |





#### Pumps testing

|                        |         |
|------------------------|---------|
| Operating pump 1       | Done    |
| Operating pump 2       | Done    |
| Operating pump 3       | Done    |
| Dry running protection | -       |
| Peak load pump 1       | Checked |
| Peak load pump 2       | Checked |
| Peak load pump 3       | Checked |
| Back up pump 1         | Checked |
| Back up pump 2         | Checked |
| Back up pump 3         | Checked |
| Direction of rotation  | Checked |

#### Visual check

|                                      |         |
|--------------------------------------|---------|
| Check the function of the ball valve | Checked |
| Check pressure gauges operation      | Checked |
| Check electrical connections         | Checked |
| Check for any leakage in the pumps   | Checked |

#### Remarks:

Firefighting Pump Set have been tested and is functioning at full capacity with all accessories. It was handed over to the project manager and is in outstanding performance.



**Imad Al Halabi**  
**Waterwave Est**  
**0553004066**  
[imad@waterwave.site](mailto:imad@waterwave.site)  
[www.waterwave.site](http://www.waterwave.site)



Successful Handling Over Certificate

شهادة إنجاز و تسليم نهائي

شركة بندر حميدة للمقاولات مكة المكرمة

تتشهد بان.....  
مجموعه الحريق يو إل ماركة مينا الإماراتية قد تم استلامها من قبل إستشاري الأمن و السلامة في الموقع و هي تعمل بصورة جيدة و بكفاءة 150% و حسب التقرير المرفق

Bandar Hmeida Contracting Co

We the undersigned , ..... , we  
confirm that above MENA UL Listed Fire Fighting Pump Set we handled over successfully to  
safety consultant and as per above parameters and 150% efficiency .



|                                                                                   |                     |  |
|-----------------------------------------------------------------------------------|---------------------|--|
|  | Vendor Ref. No.     |  |
|                                                                                   |                     |  |
|                                                                                   | Contractor Ref. No. |  |
| Project Name:                                                                     | Contractor Job No.  |  |

### UL/FM CERTIFICATES

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |



# CERTIFICATE OF COMPLIANCE

**Certificate Number** EX28929  
**Report Reference** EX28929  
**Issue Date** 2023-JANUARY-04

**Issued to:** **MENA MECH IND CO.**  
Sharjah Al Sajaa Industrial Shed 6  
Victory Warehouse, Sajja New Industrial Area  
Sharjah, United Arab Emirates

**This certificate confirms that representative samples of** Centrifugal Fire Pumps, End Suction  
See Addendum for Models

Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** ANSI/CAN/UL 448 – Centrifugal Stationary Pumps for Fire-Protection Service

**Additional Information:** See UL Product iQ® at <https://iq.ulprospector.com> for additional information.

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

*Deborah Jennings-Conner*

Deborah Jennings-Conner, VP Regulatory Services  
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact UL Customer Service at <http://ul.com/aboutul/locations/>



# CERTIFICATE OF COMPLIANCE

Certificate Number EX28929  
Report Reference EX28929  
Issue Date 2023-JANUARY-04

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

| Document Name | Rated Capacity, GPM (L/Min) | Inlet Size, in. | Outlet Size, in. | Minimum Net Pressure Range, psig (kPa) | Maximum Net Pressure Range, psig (kPa) | Approx Speed, RPM | Max Working Pressure, psig (kPa) |
|---------------|-----------------------------|-----------------|------------------|----------------------------------------|----------------------------------------|-------------------|----------------------------------|
| VES 100-200   | 450 (1,703)                 | 5               | 4                | 88 (606)                               | 143 (985)                              | 3500              | 225 (1,551)                      |
|               | 500 (1,892)                 | 5               | 4                | 88 (606)                               | 141 (972)                              | 3500              | 225 (1,551)                      |
|               | 750 (2,839)                 | 5               | 4                | 82 (565)                               | 138 (951)                              | 3500              | 225 (1,551)                      |
| VES 100-250   | 450 (1,703)                 | 5               | 4                | 83 (572)                               | 135 (930)                              | 2900              | 290 (1,999)                      |
|               | 450 (1,703)                 | 5               | 4                | 123 (848)                              | 198 (1,365)                            | 3500              | 290 (1,999)                      |
|               | 500 (1,892)                 | 5               | 4                | 83 (572)                               | 134 (923)                              | 2900              | 290 (1,999)                      |
|               | 500 (1,892)                 | 5               | 4                | 122 (841)                              | 198 (1,365)                            | 3500              | 290 (1,999)                      |
|               | 750 (2,839)                 | 5               | 4                | 74 (510)                               | 128 (882)                              | 2900              | 290 (1,999)                      |
|               | 750 (2,839)                 | 5               | 4                | 115 (792)                              | 191 (1,316)                            | 3500              | 290 (1,999)                      |
| VES 100-315   | 450 (1,703)                 | 5               | 4                | 133 (917)                              | 210 (1,447)                            | 2900              | 290 (1,999)                      |
|               | 450 (1,703)                 | 5               | 4                | 140 (965)                              | 222 (1,530)                            | 2980              | 290 (1,999)                      |
|               | 500 (1,892)                 | 5               | 4                | 132 (910)                              | 209 (1,441)                            | 2900              | 290 (1,999)                      |
|               | 500 (1,892)                 | 5               | 4                | 139 (958)                              | 221 (1,523)                            | 2980              | 290 (1,999)                      |
|               | 750 (2,839)                 | 5               | 4                | 125 (861)                              | 202 (1,392)                            | 2900              | 290 (1,999)                      |
|               | 750 (2,839)                 | 5               | 4                | 133 (917)                              | 214 (1,475)                            | 2980              | 290 (1,999)                      |
| VES 40-250    | 50 (189)                    | 2-1/2           | 1-1/2            | 101 (696)                              | 142 (979)                              | 2900              | 200 (1,378)                      |
|               | 50 (189)                    | 2-1/2           | 1-1/2            | 144 (992)                              | 207 (1,427)                            | 3500              | 290 (1,999)                      |
|               | 100 (379)                   | 2-1/2           | 1-1/2            | 97 (668)                               | 140 (965)                              | 2900              | 200 (1,378)                      |
|               | 100 (379)                   | 2-1/2           | 1-1/2            | 140 (965)                              | 203 (1,399)                            | 3500              | 290 (1,999)                      |
|               | 150 (568)                   | 2-1/2           | 1-1/2            | 87 (599)                               | 131 (903)                              | 2900              | 200 (1,378)                      |
|               | 150 (568)                   | 2-1/2           | 1-1/2            | 133 (917)                              | 196 (1,351)                            | 3500              | 290 (1,999)                      |
| VES 50-250    | 150 (568)                   | 3               | 2                | 104 (717)                              | 147 (1,013)                            | 2980              | 225 (1,551)                      |
|               | 150 (568)                   | 3               | 2                | 144 (992)                              | 202 (1,392)                            | 3500              | 290 (1,999)                      |
|               | 200 (757)                   | 3               | 2                | 101 (696)                              | 145 (999)                              | 2980              | 225 (1,551)                      |
|               | 200 (757)                   | 3               | 2                | 140 (965)                              | 200 (1,378)                            | 3500              | 290 (1,999)                      |
|               | 250 (946)                   | 3               | 2                | 97 (668)                               | 140 (965)                              | 2980              | 225 (1,551)                      |
|               | 250 (946)                   | 3               | 2                | 136 (937)                              | 196 (1,351)                            | 3500              | 290 (1,999)                      |
| VES 65-250    | 250 (946)                   | 4               | 2-1/2            | 91 (627)                               | 143 (985)                              | 2900              | 225 (1,551)                      |
|               | 250 (946)                   | 4               | 2-1/2            | 131 (903)                              | 207 (1,427)                            | 3500              | 290 (1,999)                      |
|               | 300 (1,136)                 | 4               | 2-1/2            | 89 (613)                               | 142 (979)                              | 2900              | 225 (1,551)                      |
|               | 300 (1,136)                 | 4               | 2-1/2            | 130 (896)                              | 206 (1,420)                            | 3500              | 290 (1,999)                      |
|               | 400 (1,514)                 | 4               | 2-1/2            | 82 (565)                               | 137 (944)                              | 2900              | 225 (1,551)                      |
|               | 400 (1,514)                 | 4               | 2-1/2            | 125 (861)                              | 203 (1,399)                            | 3500              | 290 (1,999)                      |
| VES 80-200    | 400 (1,514)                 | 5               | 3                | 89 (613)                               | 141 (972)                              | 3500              | 225 (1,551)                      |
|               | 450 (1,703)                 | 5               | 3                | 86 (592)                               | 139 (958)                              | 3500              | 225 (1,551)                      |
|               | 500 (1,892)                 | 5               | 3                | 83 (572)                               | 136 (937)                              | 3500              | 225 (1,551)                      |

*Deborah Jennings-Conner*  
Deborah Jennings-Conner, VP Regulatory Services  
UL LLC

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# CERTIFICATE OF COMPLIANCE

Certificate Number EX28929  
Report Reference EX28929  
Issue Date 2023-JANUARY-04

| Document Name    | Rated Capacity, GPM (L/Min) | Inlet Size, in. | Outlet Size, in. | Minimum Net Pressure Range, psig (kPa) | Maximum Net Pressure Range, psig (kPa) | Approx Speed, RPM | Max Working Pressure, psig (kPa) |
|------------------|-----------------------------|-----------------|------------------|----------------------------------------|----------------------------------------|-------------------|----------------------------------|
| VES 80-250       | 400 (1,514)                 | 5               | 3                | 88 (606)                               | 140 (965)                              | 2900              | 225 (1,551)                      |
|                  | 400 (1,514)                 | 5               | 3                | 128 (882)                              | 207 (1,427)                            | 3500              | 290 (1,999)                      |
|                  | 450 (1,703)                 | 5               | 3                | 86 (592)                               | 140 (965)                              | 2900              | 225 (1,551)                      |
|                  | 450 (1,703)                 | 5               | 3                | 127 (875)                              | 206 (1,420)                            | 3500              | 290 (1,999)                      |
|                  | 500 (1,892)                 | 5               | 3                | 84 (579)                               | 139 (958)                              | 2900              | 225 (1,551)                      |
|                  | 500 (1,892)                 | 5               | 3                | 125 (861)                              | 205 (1,413)                            | 3500              | 290 (1,999)                      |
| VES 80-315       | 450 (1,703)                 | 5               | 3                | 131 (903)                              | 207 (1,427)                            | 2900              | 290 (1,999)                      |
|                  | 500 (1,892)                 | 5               | 3                | 127 (875)                              | 204 (1,406)                            | 2900              | 290 (1,999)                      |
| VESD 150-100-200 | 500 (1,892)                 | 6               | 4                | 116 (799)                              | 142 (979)                              | 3500              | 225 (1,551)                      |
|                  | 750 (2,839)                 | 6               | 4                | 112 (772)                              | 137 (944)                              | 3500              | 225 (1,551)                      |
|                  | 1,000 (3,785)               | 6               | 4                | 99 (682)                               | 128 (882)                              | 3500              | 225 (1,551)                      |
| VESD 150-100-315 | 500 (1,892)                 | 6               | 4                | 119 (820)                              | 192 (1,323)                            | 2900              | 250 (1,723)                      |
|                  | 750 (2,839)                 | 6               | 4                | 113 (779)                              | 186 (1,282)                            | 2900              | 250 (1,723)                      |
|                  | 1,000 (3,785)               | 6               | 4                | 101 (696)                              | 173 (1,192)                            | 2900              | 250 (1,723)                      |

*Deborah Jennings-Conner*

Deborah Jennings-Conner, VP Regulatory Services  
UL LLC

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# CERTIFICATE OF COMPLIANCE

Certificate Number EX26402  
Report Reference EX26402-20191218  
Issue Date 2020-APRIL-17

Issued to: TAIZHOU TAIDONG FIRE & MARINE POWER LTD  
NO 51 XINGJIANG ROAD, PRIVATE ECONOMIC  
INDUSTRIAL CENTER  
JIANGYAN DISTRICT  
TAIZHOU  
JIANGSU 225500 CHINA

This certificate confirms that  
representative samples of

## INTERNAL-COMBUSTION ENGINES FOR DRIVING STATIONARY FIRE PUMPS

USL - Diesel engines for driving stationary fire pumps  
Diesel engines for driving stationary fire pumps consisting  
of the following model having specific power ratings,  
speeds, and number of cylinders:

Model:  
380HE, 480HE, 490HE

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 1247, Diesel Engines for Driving Stationary Fire Pumps  
Additional Information: See the UL Online Certifications Directory at  
<https://iq.ulprospector.com> for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program  
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# CERTIFICATE OF COMPLIANCE

Certificate Number EX26635  
Report Reference EX26635-20200127  
Issue Date 2020-FEBRUARY-14

Issued to: **SHANGHAI TOP MOTOR CO LTD**  
303 KANGLIU RD  
KANGQIAO TOWN  
NANHUI  
SHANGHAI  
201315 CHINA

This certificate confirms that  
representative samples of

**FIRE PUMP MOTORS**  
See Addendum page

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

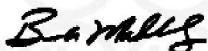
Standard(s) for Safety: UL 1004-1, Rotating Electrical Machines – General  
Requirements  
UL 1004-5, Fire Pump Motors  
CSA C22.2 No. 100-14, Motors and Generators

Additional Information: See the UL Online Certifications Directory at  
<https://iq.ulprospector.com> for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up  
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Look for the UL Certification Mark on the product.



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contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



# CERTIFICATE OF COMPLIANCE

|                    |                  |
|--------------------|------------------|
| Certificate Number | EX26635          |
| Report Reference   | EX26635-20200127 |
| Issue Date         | 2020-FEBRUARY-14 |

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

## Models/Product

[illegible]

Barnhill

**Bruce Mahrenholz, Director North American Certification Program**

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# CERTIFICATE OF COMPLIANCE

**Certificate Number** EX26635  
**Report Reference** EX26635-20200127  
**Issue Date** 2020-FEBRUARY-14

TXC449T250U4B,F-TXC449TS300U4B,F-TXC449TS300U4B,F-TXC449TS300U4B,F-TXC449TS300U4B,F-TXC586/7T350U4B,F-TXC586/7T350U4B,F-TXC586/7T350U4B,F-TXC586/7T350U4B,F-TXC586/7T400U4B,F-TXC586/7T400U4B,F-TXC586/7T400U4B,F-TXC586/7T400U4B,F-TXC586/7T450U4B,F-TXC586/7T450U4B,F-TXC586/7T450U4B,F-TXC586/7T450U4B,F-TXC145T1U6B,F-TXC145T1U6B,F-TXC145T1U6B,F-TXC145T1U6B,F-TXC182T1.5U6B,F-TXC182T1.5U6B,F-TXC182T1.5U6B,F-TXC182T1.5U6B,F-TXC184T2U6B,F-TXC184T2U6B,F-TXC184T2U6B,F-TXC184T2U6B,F-TXC213T3U6B,F-TXC213T3U6B,F-TXC213T3U6B,F-TXC213T3U6B,F-TXC215T5U6B,F-TXC215T5U6B,F-TXC215T5U6B,F-TXC215T5U6B,F-TXC215T5U6B,F-TXC254T7.5U6B,F-TXC254T7.5U6B,F-TXC254T7.5U6B,F-TXC254T7.5U6B,F-TXC256T10U6B,F-TXC256T10U6B,F-TXC256T10U6B,F-TXC256T10U6B,F-TXC284T15U6B,F-TXC284T15U6B,F-TXC284T15U6B,F-TXC284T15U6B,F-TXC286T20U6B,F-TXC286T20U6B,F-TXC286T20U6B,F-TXC286T20U6B,F-TXC324T25U6B,F-TXC324T25U6B,F-TXC324T25U6B,F-TXC324T25U6B,F-TXC326T30U6B,F-TXC326T30U6B,F-TXC326T30U6B,F-TXC326T30U6B,F-TXC364T40U6B,F-TXC364T40U6B,F-TXC364T40U6B,F-TXC364T40U6B,F-TXC365T50U6B,F-TXC365T50U6B,F-TXC365T50U6B,F-TXC365T50U6B,F-TXC404T60U6B,F-TXC404T60U6B,F-TXC404T60U6B,F-TXC404T60U6B,F-TXC405T75U6B,F-TXC405T75U6B,F-TXC405T75U6B,F-TXC405T75U6B,F-TXC444T100U6B,F-TXC444T100U6B,F-TXC444T100U6B,F-TXC444T100U6B,F-TXC445T125U6B,F-TXC445T125U6B,F-TXC445T125U6B,F-TXC445T125U6B,F-TXC447T150U6B,F-TXC447T150U6B,F-TXC447T150U6B,F-TXC447T150U6B,F-TXC449T200U6B,F-TXC449T200U6B,F-TXC449T200U6B,F-TXC449T200U6B,F-TXC586/7T250U6B,F-TXC586/7T250U6B,F-TXC586/7T250U6B,F-TXC586/7T250U6B,F-TXC586/7T300U6B,F-TXC586/7T300U6B,F-TXC586/7T300U6B,F-TXC586/7T300U6B,F-TXC586/7T350U6B,F-TXC586/7T350U6B,F-TXC586/7T350U6B,F-TXC586/7T350U6B,F-TXC586/7T400U6B,F-TXC586/7T400U6B,F-TXC586/7T400U6B,F-TXC586/7T400U6B,

*B. Mahrenholz*

Bruce Mahrenholz, Director North American Certification Program

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# CERTIFICATE OF COMPLIANCE

**Certificate Number** EX26635  
**Report Reference** EX26635-20200127  
**Issue Date** 2020-FEBRUARY-14

F-TDC254T15U2B,F-TDC254T15U2B,F-TDC254T15U2B,F-TDC254T15U2B,F-TDC256T20U2B,F-TDC256T20U2B,F-TDC256T20U2B,F-TDC256T20U2B,F-TDC284TS25U2B,F-TDC284TS25U2B,F-TDC284TS25U2B,F-TDC284TS25U2B,F-TDC286TS30U2B,F-TDC286TS30U2B,F-TDC286TS30U2B,F-TDC286TS30U2B,F-TDC286TS40U2B,F-TDC286TS40U2B,F-TDC286TS40U2B,F-TDC286TS40U2B,F-TDC324TS40U2B,F-TDC324TS40U2B,F-TDC324TS40U2B,F-TDC324TS40U2B,F-TDC324TS50U2B,F-TDC324TS50U2B,F-TDC324TS50U2B,F-TDC324TS50U2B,F-TDC326TS50U2B,F-TDC326TS50U2B,F-TDC326TS50U2B,F-TDC326TS50U2B,F-TDC326TS60U2B,F-TDC326TS60U2B,F-TDC326TS60U2B,F-TDC326TS60U2B,F-TDC364TS60U2B,F-TDC364TS60U2B,F-TDC364TS60U2B,F-TDC364TS60U2B,F-TDC364TS75U2B,F-TDC364TS75U2B,F-TDC364TS75U2B,F-TDC364TS75U2B,F-TDC365TS75U2B,F-TDC365TS75U2B,F-TDC365TS75U2B,F-TDC365TS75U2B,F-TDC365TS100U2B,F-TDC365TS100U2B,F-TDC365TS100U2B,F-TDC365TS100U2B,F-TDC405TS100U2B,F-TDC405TS100U2B,F-TDC405TS100U2B,F-TDC405TS100U2B,F-TDC404TS125U2B,F-TDC404TS125U2B,F-TDC404TS125U2B,F-TDC404TS125U2B,F-TDC444TS125U2B,F-TDC444TS125U2B,F-TDC444TS125U2B,F-TDC444TS125U2B,F-TDC405TS150U2B,F-TDC405TS150U2B,F-TDC405TS150U2B,F-TDC405TS150U2B,F-TDC445TS150U2B,F-TDC445TS150U2B,F-TDC445TS150U2B,F-TDC445TS150U2B,F-TDC444TS200U2B,F-TDC444TS200U2B,F-TDC444TS200U2B,F-TDC444TS200U2B,F-TDC447TS200U2B,F-TDC447TS200U2B,F-TDC447TS200U2B,F-TDC447TS200U2B,F-TDC449TS250U2B,F-TDC449TS250U2B,F-TDC449TS250U2B,F-TDC449TS250U2B,F-TDC447TS300U2B,F-TDC447TS300U2B,F-TDC447TS300U2B,F-TDC447TS300U2B,F-TDC449TS300U2B,F-TDC449TS300U2B,F-TDC449TS300U2B,F-TDC449TS300U2B,F-TDC449TS350U2B,F-TDC449TS350U2B,F-TDC449TS350U2B,F-TDC449TS350U2B,F-TDC449TS350U2B,F-TDC449TS350U2B,F-TDC449TS350U2B,F-TDC449TS350U2B,F-TDC449TS400U2B,F-TDC449TS400U2B,F-TDC449TS400U2B,F-TDC449TS400U2B,F-TDC449TS450U2B,F-TDC449TS450U2B,F-TDC449TS450U2B,F-TDC449TS450U2B,F-TDC449TS500U2B,F-TDC449TS500U2B,F-TDC449TS500U2B,F-TDC449TS500U2B,F-TDC254T15U4B,F-TDC254T15U4B,F-TDC254T15U4B,F-TDC254T15U4B,F-TDC256T20U4B,F-TDC256T20U4B,F-TDC256T20U4B,F-TDC256T20U4B,F-TDC284T25U4B,F-TDC284T25U4B,F-TDC284T25U4B,F-TDC284T25U4B,F-TDC286T30U4B,F-TDC286T30U4B,F-TDC286T30U4B,F-TDC286T30U4B,F-TDC324T40U4B,F-TDC324T40U4B,F-TDC324T40U4B,F-TDC324T40U4B,F-TDC326T50U4B,F-TDC326T50U4B,F-TDC326T50U4B,F-TDC326T50U4B,F-TDC364T60U4B,F-TDC364T60U4B,F-TDC364T60U4B,F-TDC364T60U4B,F-TDC365T75U4B,F-TDC365T75U4B,F-TDC365T75U4B,F-TDC365T75U4B,F-TDC405T100U4B,F-TDC405T100U4B,F-TDC405T100U4B,F-TDC405T100U4B,F-TDC405T125U4B,F-TDC405T125U4B,F-TDC405T125U4B,F-TDC405T125U4B,F-TDC444T125U4B,F-TDC444T125U4B,F-TDC444T125U4B,F-TDC444T125U4B,F-TDC444T150U4B,F-TDC444T150U4B,F-TDC444T150U4B,F-TDC444T150U4B,F-TDC445T150U4B,F-TDC445T150U4B,F-TDC445T150U4B,F-TDC445T150U4B,F-TDC445T200U4B,F-TDC445T200U4B,F-TDC445T200U4B,F-TDC445T200U4B,F-TDC447T200U4B,F-TDC447T200U4B,F-TDC447T200U4B,F-TDC447T200U4B,F-TDC447T250U4B,F-TDC447T250U4B,F-TDC447T250U4B,F-TDC447T250U4B,F-TDC449T250U4B,F-TDC449T250U4B,F-TDC449T250U4B,F-TDC449T250U4B,F-TDC449T300U4B,F-TDC449T300U4B,F-TDC449T300U4B,F-TDC449T300U4B,F-TDC449T350U4B,F-TDC449T350U4B,F-TDC449T350U4B,F-TDC449T350U4B,F-

*B. Mahrenholz*

Bruce Mahrenholz, Director North American Certification Program

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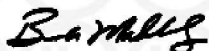




# CERTIFICATE OF COMPLIANCE

Certificate Number EX26635  
Report Reference EX26635-20200127  
Issue Date 2020-FEBRUARY-14

TDC449T350U4B,F-TDC449T350U4B,F-TDC449T400U4B,F-TDC449T400U4B,F-  
TDC449T400U4B,F-TDC449T400U4B,F-TDC449T450U4B,F-TDC449T450U4B,F-TDC449T450U4B,



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## QYZS.EX3971 Pump Controllers, Fire

[Page Bottom](#)

### Pump Controllers, Fire

[See General Information for Pump Controllers, Fire](#)
**TORNATECH INC**

EX3971

#132

7075 PLACE ROBERT-JONCAS

ST LAURENT, QC H4M 2Z2 CANADA

**Fire Pump Controllers:** Models AF, AFP, AFR, AFY, ATF, ATR, ATP or ATY followed by C or N, followed by additional suffixes. All of the above controllers are suitable for use on circuits capable of delivering high fault currents. The withstand ratings are as follows:

| Circuit Breaker      | Max V AC | Max Short Circuit Current RMS Symmetrical Amps |
|----------------------|----------|------------------------------------------------|
| MZMH6-63, MZMH6-100, | 208; 240 | 25000; 42,000                                  |
| MZMH6-160, MZMH6-250 |          |                                                |
| MZMH6-63, MZMH6-100, | 480      | 65,000                                         |
| MZMH6-160, MZMH6-250 |          |                                                |

The controllers provided with Automatic Transfer Switches are suitable for use on circuits capable of delivering high fault currents. The withstand rating of the normal power source side is determined by the transfer switch as indicated below:

| ASCO Transfer Switch | Max Controller Short Circuit Withstand Rating |
|----------------------|-----------------------------------------------|
| 9403704              | 22KA, 480 VAC Max                             |
| 94031004             | 22KA, 480 VAC Max                             |
| 94032604             | 35KA, 480 VAC Max                             |

The withstand ratings for the alternate power source side will be dependent upon the ratings of the external circuit breaker provided. But in no case will they exceed those of the normal power source side.

Models AL or AL1 followed by additional suffixes.

All of the above controllers are suitable for use on circuits capable of delivering high fault currents. The withstand ratings are as follows:

| Circuit Breaker      | Max V AC | Max Short Circuit Current RMS Symmetrical Amps |
|----------------------|----------|------------------------------------------------|
| NZM6B-63,            | 480      | 25,000                                         |
| NZM6B-100, NZM6B-160 |          |                                                |

The controllers provided with automatic Transfer Switches are suitable for use on circuits capable of delivering high fault currents. The withstand rating of the entire controller is determined by the transfer switch as indicated below:

| ASCO Transfer Switch | Max Controller S. C. Withstand Rating |
|----------------------|---------------------------------------|
| 9403704              | 22KA, 480 VAC Max                     |
| 94031004             | 22KA, 480 VAC Max                     |
| 94032604             | 25KA, 480 VAC Max                     |

The withstand ratings for the alternate power source side will be dependent upon the ratings of the external circuit breaker provided. But in no case will they exceed those of the normal power source side.

Authorities having jurisdiction should be consulted in all cases.

Model FPD Series controller for engine-driven centrifugal fire pumps.

Models FPA, FPP, FPR, FPS, FPV, FPW, FPY, VPA, VPR, and VPS may be followed by additional suffixes. The withstand ratings are as follows:

#### Withstand Ratings of Controllers Without Transfer Switch:

| Short Circuit Withstand Ratings<br>(Ampere Symmetrical) |              |                  |
|---------------------------------------------------------|--------------|------------------|
| VOLTAGE                                                 | STANDARD     | OPTIONAL<br>HIGH |
| 200 to 480 V                                            | 100,000A RMS | 150,000A RMS     |
| 575 to 600 V                                            | 50,000A RMS  | 100,000A RMS     |

Models ATG , ATU, VPG or VPU. The controllers provided with Automatic Transfer Switches are suitable for use on circuits capable of delivering high fault currents. The withstand rating of the normal power side is the same as the withstand ratings of controllers without transfer switches. The withstand rating of the alternate power side is determined by the transfer switch as indicated by the following tables:

**Withstand ratings of controllers with 120 A Tornatech Inc. Transfer Switch**

| 200-208V<br>50/60 Hz<br>MAX HP | 230-240V<br>50/60 Hz<br>MAX HP | 380-416V<br>50/60 Hz<br>MAX HP | 440-480V<br>50/60 Hz<br>MAX HP | 600V<br>60Hz<br>MAX HP | Withstand<br>Rating (A) |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|------------------------|-------------------------|
| 40                             | 40                             | —                              | —                              | —                      | 65,000                  |
| —                              | —                              | 60                             | 75                             | —                      | 25,000                  |
| —                              | —                              | —                              | —                              | 100                    | 18,000                  |

**Withstand Ratings For Controllers with Ascolectric Transfer Switches**

| Transfer<br>Switch<br>(A) | 200-208V<br>50/60 Hz<br>Max HP | 230-240V<br>50/60 Hz<br>Max HP | Withstand<br>Rating |                  | Specific**<br>Withstand<br>Rating<br>(A) |
|---------------------------|--------------------------------|--------------------------------|---------------------|------------------|------------------------------------------|
|                           |                                |                                | (A)                 | Time<br>(Cycles) |                                          |
| 100                       | 30                             | 30                             | 10000               | 1.5              | 22000                                    |
| 150                       | 50                             | 50                             | 1000                | 1.5              | 22000                                    |
| 400                       | 150                            | 150                            | 35000               | 3                | 42000                                    |
| 600                       | N/A                            | N/A                            | 50000               | 3                | 65000                                    |

\*\* Tested and found suitable for 100kA

**Withstand Ratings for Controllers with Ascolectric Transfer Switches, Continued**

| Transfer<br>Switch<br>(A) | 600V<br>60 Hz<br>Max HP | Withstand Rating |                  | Specific Withstand<br>Rating<br>(A) |
|---------------------------|-------------------------|------------------|------------------|-------------------------------------|
|                           |                         | (A)              | Time<br>(Cycles) |                                     |
| 100                       | 75                      | 10000            | 1.5              | N/A                                 |
| 150                       | 150                     | 1000             | 1.5              | N/A                                 |
| 400                       | 400                     | 22000            | 3                | N/A                                 |
| 600                       | N/A                     | N/A              | N/A              | N/A                                 |

|                          |                       |                                                                 |
|--------------------------|-----------------------|-----------------------------------------------------------------|
| <b>Model ATU or VPU:</b> | Normal Power Side:    | Same as withstand rating of controller without transfer switch. |
|                          | Alternate Power Side: | Same as withstand rating of controller without transfer switch. |

|                   |                                                                |
|-------------------|----------------------------------------------------------------|
| <b>Model FPL:</b> | Limited Service controllers with withstand ratings as follows: |
|-------------------|----------------------------------------------------------------|

| Short Circuit Withstand Ratings of Limited Service Controllers Without Transfer Switches |              |                  |
|------------------------------------------------------------------------------------------|--------------|------------------|
| VOLTAGE                                                                                  | STANDARD     | OPTIONAL<br>HIGH |
| 200 to 480 V                                                                             | 25,000 A RMS | 65,000 A RMS     |
| 575 to 600 V                                                                             | 18,000 A RMS | 25,000 A RMS     |

|                        |                                                                        |
|------------------------|------------------------------------------------------------------------|
| <b>Model LTG, GLG:</b> | Automatic transfer switch for connection to a generator set.           |
| <b>Model LTU:</b>      | Automatic transfer switch for connection to a 2 <sup>nd</sup> utility. |

Withstand ratings of Controller with transfer switch Model FPAT (Tornatech):



|                   |                       |                                                                                                    |
|-------------------|-----------------------|----------------------------------------------------------------------------------------------------|
| <b>Model LTG:</b> | Normal Power Side:    | Same as withstand rating of controller without transfer switch.                                    |
|                   | Alternate Power Side: | Withstand rating only applies when the generator set is protected by a molded case circuit breaker |

| <b>TRANSFER SWITCH<br/>AMPERES</b> | <b>200-480 V<br/>H.P.</b> | <b>WITHSTAND RATING<br/>AMPERES</b> |
|------------------------------------|---------------------------|-------------------------------------|
| 120                                | 30                        | 25,000                              |

| <b>TRANSFER SWITCH<br/>AMPERES</b> | <b>600 V<br/>H.P.</b> | <b>WITHSTAND RATING<br/>AMPERES</b> |
|------------------------------------|-----------------------|-------------------------------------|
| 120                                | 30                    | 18,000                              |

|                   |                       |                                                                 |
|-------------------|-----------------------|-----------------------------------------------------------------|
| <b>Model LTU:</b> | Normal Power Side:    | Same as withstand rating of controller without transfer switch. |
|                   | Alternate Power Side: | Same as withstand rating of controller without transfer switch. |

Withstand ratings of controller with transfer switch Model 940 (Ascolectric):

|                   |                       |                                                                                                                                                            |
|-------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model LTG:</b> | Normal Power Side:    | Same as withstand rating of controller without transfer switch.                                                                                            |
|                   | Alternate Power Side: | Withstand rating only applies when the generator set is protected by a molded case circuit breaker not exceeding the ampere rating of the transfer switch. |

| <b>Transfer<br/>Switch A</b> | <b>200-480 V<br/>Max HP</b> | <b>Withstand Rating</b> |             | <b>Specific Withstand<br/>Rating A</b> |
|------------------------------|-----------------------------|-------------------------|-------------|----------------------------------------|
|                              |                             | <b>A</b>                | <b>Time</b> |                                        |
| 120                          | 30                          | 10,000                  | 1.5         | 22,000                                 |

| <b>Transfer<br/>Switch A</b> | <b>600 V<br/>Max HP</b> | <b>Withstand Rating</b> |             | <b>Specific Withstand<br/>Rating A</b> |
|------------------------------|-------------------------|-------------------------|-------------|----------------------------------------|
|                              |                         | <b>A</b>                | <b>Time</b> |                                        |
| 120                          | 30                      | 10,000                  | 1.5         | N/A                                    |

|                   |                       |                                                                 |
|-------------------|-----------------------|-----------------------------------------------------------------|
| <b>Model LTU:</b> | Normal Power Side:    | Same as withstand rating of controller without transfer switch. |
|                   | Alternate Power Side: | Same as withstand rating of controller without transfer switch. |

Models CPA, CPP, CPR, CPS, CPV, CPW, CPY, may be followed by additional suffixes. The withstand ratings are as follows:

Withstand ratings of controllers without transfer switch:

| <b>Short circuit withstand ratings (ampere symmetrical)</b> |                 |                 |
|-------------------------------------------------------------|-----------------|-----------------|
| <b>voltage</b>                                              | <b>standard</b> | <b>optional</b> |
| 200 to 480 V                                                | 100 kA          | 150 kA          |
| 575 to 600 V                                                | 50 kA           | 100 kA          |

Model CPU - The controllers provided with automatic transfer switches are suitable for use on circuits capable of delivering high fault currents. The withstand rating of the normal power side and the alternate power side is the same as the withstand ratings of controllers without transfer switches.

Model CPU

| <b>Short circuit withstand rating for alternate power circuit with transfer switch (RMS Symmetrical)</b> |                 |                        |
|----------------------------------------------------------------------------------------------------------|-----------------|------------------------|
| <b>V</b>                                                                                                 | <b>Standard</b> | <b>High (optional)</b> |
| 200 to 480 V                                                                                             | 100 kA          | 150 kA                 |
| 575 to 600 V                                                                                             | 50 kA           | 100 kA                 |

Model GPD Series controller for engine-driven centrifugal fire pumps.

**Overcurrent Protection Panels**, Model OPD; may be followed by a number 200 through 575 with - or /; followed by a number 200 through 600 with /; followed by a number 10 through 500 with /; followed by 1 or 3 with /; followed by 50 or 60 or 50/60. - These panels provide separate overcurrent protection and disconnect to comply with NFPA 70 Article 695.4(B)(2)(a) and 695.4(B)(3) and NFPA 20 Article 9.2.3.1, 9.2.3.4, and 9.2.3.4.1.

| <b>Short Circuit Withstand Ratings, A Symmetrical</b> |                 |                        |                      |
|-------------------------------------------------------|-----------------|------------------------|----------------------|
| <b>V</b>                                              | <b>Standard</b> | <b>High (Optional)</b> | <b>High Capacity</b> |
| 200-480                                               | 25,000          | 35,000 to 65,000       | 150,000              |

|         |        |                  |                  |
|---------|--------|------------------|------------------|
| 575-600 | 18,000 | 20,000 to 25,000 | 50,000 to 100,00 |
|---------|--------|------------------|------------------|

**Battery chargers**, BCE10, followed by 12 or 24, followed by 120 or 220.

**Fire pump controllers**, horsepower rated, Models GPA, GPAe, GPP, GPR, GPS, GPV, GPY, GPYe or GPW; may be followed by a number 110 through 575 with - or /; followed by a number 200 through 600 with /; followed by a number 1 through 500 with /; followed by 1 or 3 with /; followed by 50 or 60 or 50/60.

**Fire pump controllers**, kilowatt rated, Models GPA, GPAe, GPP, GPR, GPS, GPV, GPY, GPYe or GPW; followed by -400/; followed by a number 0.75 through 315 with kW/; followed by 3 with /; followed by 50 or 60 or 50/60.

**Transfer switch**, horsepower rated, Model GPU; may be followed by a number 110 through 575 with - or /; followed by a number 200 through 600 with /; followed by a number 1 through 500 with /; followed by 1 or 3 with /; followed by 50 or 60 or 50/60.

**Transfer switch**, kilowatt rated, Model GPU; followed by -400/; followed by a number 0.75 through 315 with kW/; followed by 3 with /; followed by 50 or 60 or 50/60.

**Withstand ratings of normal power circuit for GPA, GPAe, GPP, GPR, GPS, GPV, GPY, GPYe and GPW controllers with or without gpu transfer switch.**

| Short Circuit Withstand Ratings for normal power circuit with or without transfer switch, A Symmetrical |          |                   |
|---------------------------------------------------------------------------------------------------------|----------|-------------------|
| V                                                                                                       | Standard | High (Optional) + |
| 200-480                                                                                                 | 100,000  | 150,000           |
| 575-600 +                                                                                               | 50,000   | 100,000           |
| + - Not applicable to controllers that use NOARK Power Components.                                      |          |                   |

**Limited service fire pump controllers**, kilowatt rated, Models GPL; followed by -400/; followed by a number 0.75 through 315 with kW/; followed by 3 with /; followed by 50 or 60 or 50/60.

**Limited service fire pump controllers**, , kilowatt rated, Models GPL; followed by -400/; followed by a number 0.75 through 315 with kW/; followed by 3 with /; followed by 50 or 60 or 50/60.

**Limited service transfer switch**, for connection to a second utility, horsepower rated, Model GLU; may be followed by a number 110 through 575 with - or /; followed by a number 200 through 600 with /; followed by a number 1 through 500 with /; followed by 1 or 3 with /; followed by 50 or 60 or 50/60.

**Limited service transfer switch**, for connection to a second utility, kilowatt rated, Model GLU; followed by -400/; followed by a number 0.75 through 315 with kW/; followed by 3 with /; followed by 50 or 60 or 50/60.

**Withstand ratings of normal power circuit for GPL controller with or without GLU transfer switch.**

| Short Circuit Withstand Ratings for normal power circuit with or without transfer switch, A Symmetrical |          |                 |
|---------------------------------------------------------------------------------------------------------|----------|-----------------|
| V                                                                                                       | Standard | High (Optional) |
| 200-240                                                                                                 | 65,000   | -               |
| 380-480                                                                                                 | 25,000   | 65,000          |
| 575-600                                                                                                 | 18,000   | 25,000          |

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# Certificate of Compliance

This certificate is issued for the following:

**Controllers for Electric Motor Driven and  
Diesel Engine Driven Fire Pumps**

**Model GPx Series electric motor driven and  
Model GPD diesel engine driven fire pump controllers  
manufactured at Tornatech FZE in Dubai, UAE**

**Prepared for:**

**TornaTech Inc.**  
7075 Pl Robert-Joncas, #132  
St Laurent, QC H4M 2Z2  
Canada

**Manufactured at:**

TornaTech FZE  
Warehouse CC-4 near R/A 08  
P.O. Box 18435, Jebel Ali  
Dubai, United Arab Emirates

FM Approvals Class: 1321/1323

Approval Identification: 0003052698

Approval Granted: June 24, 2014

To verify the availability of the Approved product, please refer to [www.approvalguide.com](http://www.approvalguide.com)

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

Richard B. Dunne  
Manager, Fire Protection  
FM Approvals  
1151 Boston-Providence Turnpike  
Norwood, MA 02062



*Member of the FM Global Group*

## CERTIFICATE OF COMPLIANCE

### This certificate of compliance validates the following

|                                   |                                                                              |                          |                                                                                              |
|-----------------------------------|------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------|
| TEST REPORT NUMBER:               | 3052698                                                                      | TEST CERTIFICATE NUMBER: | 3052698                                                                                      |
| DATE OF ISSUE:                    | 24 June, 2014                                                                | DATE OF ISSUE:           | 24 June, 2014                                                                                |
| DATE OF EXPIRY:                   | NONE                                                                         | DATE OF EXPIRY:          | NONE                                                                                         |
| NAME OF FACTORY/<br>MANUFACTURER: | <b>TORNATECH INC.</b>                                                        | NAME OF THE BRAND(S):    | TORNATECH FZE                                                                                |
| ADDRESS/REGION:                   | 7075 PLACE ROBERT-JONCAS,<br>#132<br>SAINT LAURENT, QUEBEC<br>H4M 2Z2 CANADA |                          | Warehouse CC-4 near R/A<br>08<br>P.O. Box 18435, Jebel Ali<br>Dubai, United Arab<br>Emirates |
|                                   |                                                                              | MODEL/NO:                | GPx series<br>GPD series                                                                     |



LOGO ON THE PRODUCT:



|                                             |                                                                                                                                                                                                                                                                           |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DESCRIPTION OF THE<br>PRODUCT:              | Samples of the GPx series and GPD series were submitted for examination and testing. All testing and analysis was conducted and verified to be in compliance with the Standards listed in the Test Standards section below                                                |
| TEST STANDARD:                              | FM Approvals, Approval Standard for Controllers for Electric Motor and Diesel Engine Driven Fire Pumps, Class 1321/1323, dated November 2007                                                                                                                              |
| TEST DESCRIPTION:                           | All testing and analysis considered appropriate was conducted and verified to be in compliance with the Standards listed in the Test Standards section. All data is on file at FM Approvals along with other documentation and correspondence applicable to this program. |
| SPECIFICATION OF<br>TEST SPECIMEN:          | The samples were considered to be representative of the product line and were examined, tested, and compared to the manufacturer's drawings.                                                                                                                              |
| TEST RESULTS:                               | Pass                                                                                                                                                                                                                                                                      |
| NAME OF TEST FACILITY:                      | FM Approvals                                                                                                                                                                                                                                                              |
| TEST FACILITY ADDRESS/REGION:               |                                                                                                                                                                                                                                                                           |
| LABORATORY CONTACT:                         | Mr. Richard Dunne                                                                                                                                                                                                                                                         |
| CONTACT PHONE:                              | 1-401-567-5701                                                                                                                                                                                                                                                            |
| CONTACT EMAIL:                              | <a href="mailto:Richard.Dunne@fmaprovals.com">Richard.Dunne@fmaprovals.com</a>                                                                                                                                                                                            |
| PRODUCT APPLICATION GUIDELINE<br>(END USE): | Installations shall comply with the manufacturer's instructions.                                                                                                                                                                                                          |

SIGNED BY:



The above certificate is valid only when installed in accordance with the "Product Application Guideline (End Use)" as stated above. To verify the validity of the product please log into our website, [www.approvalguide.com](http://www.approvalguide.com).





# Certificate of Compliance

This certificate is issued for the following:

**Fire Pump Flowmeter Systems**  
(See complete listing details below)

**Prepared for:**

Quest Engineering dba Gerand Engineering  
2300 Edgewood Avenue South  
St. Louis Park, MN 55426

FM Approvals Class: 1046

Approval Identification: 3058542

Approval Granted: April 26, 2016

To verify the product continues to be Approved please refer to [www.approvalguide.com](http://www.approvalguide.com).

Said Approval is subject to satisfactory field performance, continuing Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

A handwritten signature in dark ink, appearing to read 'D.B. Fuller'.

---

David B. Fuller  
AVP, Manager of Fire Protection  
FM Approvals  
1151 Boston-Providence Turnpike  
Norwood, MA 02062 USA



*Member of the FM Global Group*



## Certificate of Compliance

| Pump Rating,<br>gal/min (dm <sup>3</sup> /min) | Nominal Meter Line Size<br>in. | Model Designation |                |
|------------------------------------------------|--------------------------------|-------------------|----------------|
|                                                |                                | Venturi<br>(1)    | Orifice<br>(2) |
| 25<br>(95)                                     | 1 1/4                          | GV-25-1 1/4       | -              |
| 50<br>(190)                                    | 2                              | GV-50-2           | -              |
| 100<br>(380)                                   | 2 1/2                          | GV-100-2 1/2      | GO-100-2 1/2   |
| 150<br>(570)                                   | 3                              | GV-150-3          | GO-150-3       |
| 200<br>(755)                                   | 3, 4                           | GV-200-3, 4       | GO-200-3, 4    |
| 250<br>(945)                                   | 4, 5                           | GV-250-4, 5       | GO-250-4, 5    |
| 300<br>(1135)                                  | 4                              | GV-300-4          | GO-300-4       |
| 400<br>(1515)                                  | 4, 5                           | GV-400-4, 5       | GO-400-4, 5    |
| 450<br>(1705)                                  | 4, 5                           | GV-450-4, 5       | GO-450-4, 5    |
| 500<br>(1895)                                  | 5, 6                           | GV-500-5, 6       | GO-500-5, 6    |
| 750<br>(2840)                                  | 5, 6                           | GV-750-5, 6       | GO-750-5, 6    |
| 1000<br>(3785)                                 | 6, 8                           | GV-1000-6, 8      | GO-1000-6, 8   |
| 1250<br>(4730)                                 | 6, 8                           | GV-1250-6, 8      | GO-1250-6, 8   |
| 1500<br>(5680)                                 | 8, 10                          | GV-1500-8, 10     | GO-1500-8, 10  |
| 2000<br>(7570)                                 | 8, 10                          | GV-2000-8, 10     | GO-2000-8, 10  |
| 2500<br>(9465)                                 | 8, 10                          | GV-2500-8, 10     | GO-2500-8, 10  |
| 3000<br>(11 355)                               | 8, 10                          | GV-3000-8, 10     | GO-3000-8, 10  |



Member of the FM Global Group



## Certificate of Compliance

| Pump Rating,<br>gal/min (dm <sup>3</sup> /min) | Nominal Meter Line Size<br>in. | Model Designation |                |
|------------------------------------------------|--------------------------------|-------------------|----------------|
|                                                |                                | Venturi<br>(1)    | Orifice<br>(2) |
| 3500<br>(13 245)                               | 10, 12                         | GV-3500-10, 12    | GO-3500-10, 12 |
| 4000<br>(15 140)                               | 10, 12                         | GV-4000-10, 12    | GO-4000-10, 12 |
| 4500<br>(17 035)                               | 10, 12                         | GV-4500-10, 12    | GO-4500-10, 12 |
| 5000<br>(18 925)                               | 10, 12                         | GV-5000-10, 12    | GO-5000-10, 12 |

Each system consists of a Gerand Venturi (GV) or a Gerand Orifice (GO), a differential meter reading in gpm or dm<sup>3</sup>/min and associated fittings.

GV systems can be equipped with either a 4 1/2 in. dial meter (Gerand Model K) or a 6 in. dial meter (Gerand Model M). GO systems are only available with a 4 1/2 in. dial meter (Gerand Model I). Permanent installations (wall or panel mount) or portable installations are available on all systems. Rated working pressure is 500 psi (3445 kPa) except that:

GV systems with Model M dial meter have a rated working pressure of 175 psi (1205 kPa).

GV systems with Model K dial meter and Class 150 flanges have a rated working pressure of 275 psi (1905 kPa).

The following end-connection styles are available:

Venturi (1)/VS. Brass screw ends, 1 1/4 through 2 1/2 in.

Venturi (1)/VW-B. Steel butt-welded ends, 2 1/2 through 12 in.

Venturi (1)/V-GE. Steel grooved ends, 2 1/2 through 12 in.

Venturi (1)/VW-F. Steel flanged ends, 2 1/2 through 12 in. Class 150 flanges rated at 275 psi (1905 kPa). Class 300 flanges rated at 500 psi (3445 kPa).

Orifice (2). Steel socket-welded ends with adaptability for flanging, 2 1/2 through 12 in.



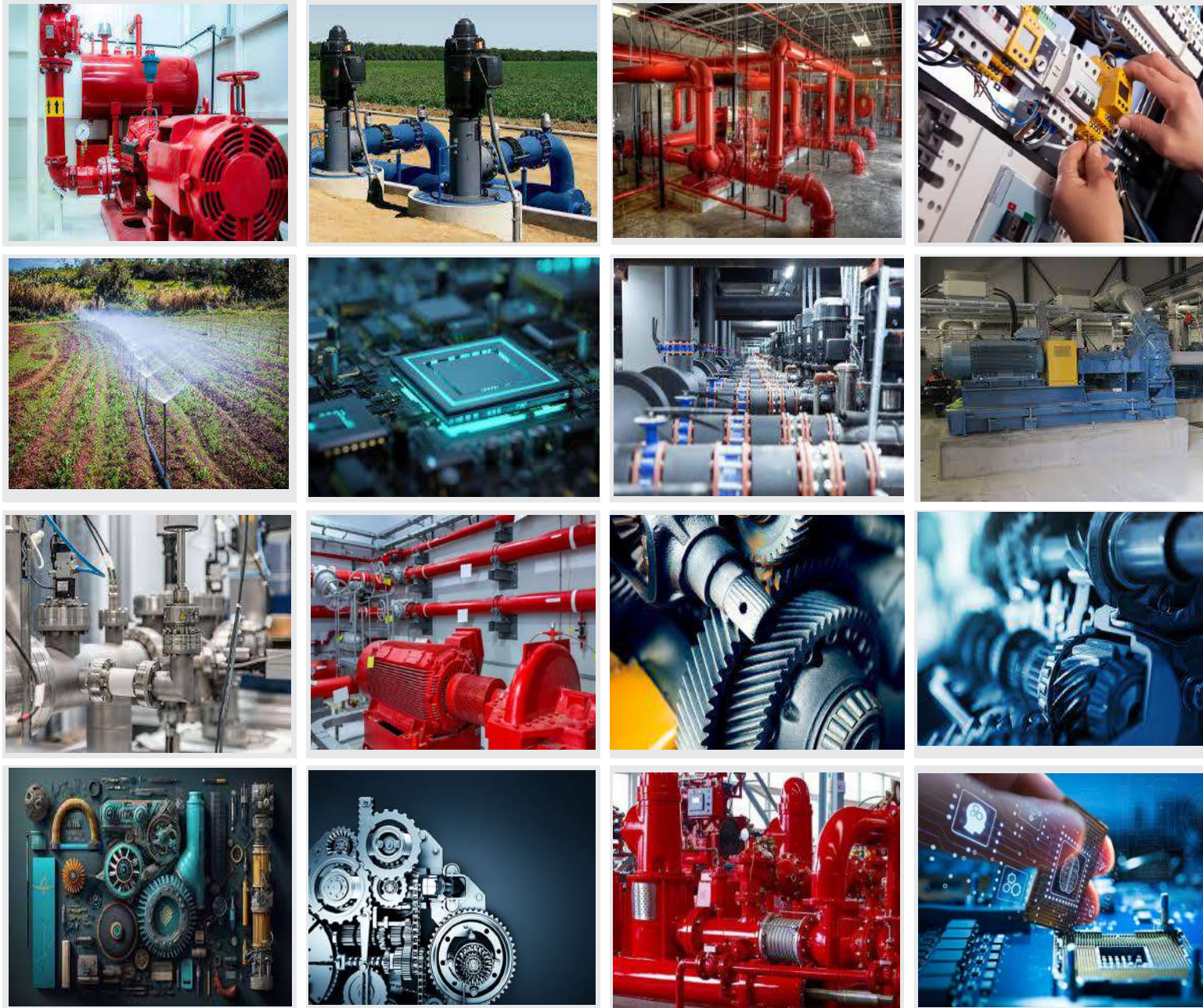
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|                                                                                   |                     |  |
|-----------------------------------------------------------------------------------|---------------------|--|
|  | Vendor Ref. No.     |  |
|                                                                                   |                     |  |
|                                                                                   | Contractor Ref. No. |  |
| Project Name:                                                                     | Contractor Job No.  |  |

## COMPANY PROFILE & TRADE LICENSE

|            |                               |                 |                |                 |             |
|------------|-------------------------------|-----------------|----------------|-----------------|-------------|
|            |                               |                 |                |                 |             |
|            |                               |                 |                |                 |             |
|            |                               |                 |                |                 |             |
|            |                               |                 |                |                 |             |
| <i>0</i>   | <i>SUBMITTED FOR APPROVAL</i> | <i>MS</i>       | <i>KY</i>      |                 |             |
| <i>Rev</i> | <i>Description</i>            | <i>Prepared</i> | <i>Checked</i> | <i>Approved</i> | <i>Date</i> |





# MENA MECHANICAL INDUSTRIES CO.

## COMPANY PROFILE



# CEO MESSAGE

Mena Mech Ind co has undergone a remarkable evolution in the past six years in the UAE. In the last 37 years in the Middle East, we've pursued our vision to become the leading fire pump systems provider in the Middle East and north Africa. But one of the most profound changes that have taken place over time is that we have a deeper and richer understanding, commitment and sustainability that has come into focus as we have refined our views of what it means to be a leader.

Today, as a result, we are increasingly adapting Mena strategies, operations and culture to drive positive results across our experience and provide a superior quality product to serve the commitments.

Our commitment in MENA is much stronger than ever. Indeed, one of the most important aspects of growth, opportunities for our company depends on solving engineering challenges a reality that is making sustainability a competitive imperative in the industry.

We also know our Customer's expectations from a leading company like Mena.

Our Company Profile will provide multiple examples of our commitment for supply, operation and after sales service, across wide range of products, from Fire Pump Solutions to pumps of the water sector, along with engineering Solutions etc.

MENA branches expands in all UAE emirates, Egypt, Palestine, Sudan, GCC Countries, and North Africa to serve our client.

With your continuous support and trust, Mena now poised to further grow its Middle east and north Africa network. In the end, I appreciate your business commitment.

**Eng. Mamoun A. Al-Burieni**  
Chief Executive Officer



## VISION

MENA MECH aspires to be among the leading companies of the field in the MENA region, renowned and recognized around the globe for offering comprehensive, professional services & products of the highest quality for its distinctive clients.

## MISSION

MENA is committed to providing its clients with service and products of the highest quality; offering a comprehensive platform of services and products. Promoting the personal, and social career growth of all employees, adding to the human knowledge of contributing to culture, social and economic progress of society preserving and promoting the Arab, Islamic culture, heritage and history; and contributing to the advancement of firefighting and security of lives of people living in the middle east and north Africa.

## VALUES

- Commitment to our clients.
- Be reliable and add value to our customers.
- Empowerment, Integrity, Excellence and Collaboration.
- Trust our employees to make the right decisions.
- Show transparency in everything we do.
- Operate professionally, safely & effectively.
- Cooperation; work as one team to deliver value.





## OUR STRATEGY

## GUIDING PRIORITIES

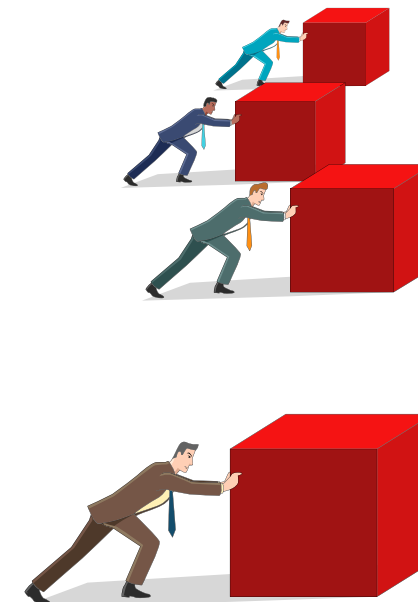
A major and comprehensive company: Mena Fire Fighting offers varieties of Pumping Solutions, in the field of firefighting and Water Applications.

### • Client Success:

The company is committed to enriching its client's success within an economy rich environment.

### • Emphasis on Quality:

The standard of our company enhances us to practice a diversity of designs that allow and evaluates the client's request. Our effectiveness and practicality of all the services and products offered by the company are to provide the best result for our clients.



### • Supportive:

Our company emphasizes the importance of our services and products by providing the required training to operate the product and maintenance period to ensure that the client receives the maximum benefit of our services and products supplied.

### • Global Vision:

Our Company takes pride in being a part of an international Supply chain with partner companies around the globe.

### • Research Intensive:

Our company is continuously making strident moves to establish itself nationally and internationally through extensively researching the latest technologies in the field.



### • Engagement With The Community:

Our company plays a vital role in the social and economic development and safety of UAE and middle east by introducing the most advanced technologies with affordable and competitive prices.



## GUIDING PRIORITIES

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- **Engagement With The Community:**

Our company plays a vital role in the social and economic development and safety of UAE and middle east by introducing the most advanced technologies with affordable and competitive prices.



## SAFETY POLICY

MENA MECH IND CO is committed to emphasize on the education, interest and awareness of new employees in safety concepts in a safe environment before the assumption of duty.

Ensure that the organization's environment, facilities, equipment and substances are subject to safe systems of work to prevent risks to health or safety.

Just as we are keen for our client's safety, our employees have to be provided by the safest working environment including a spacious atmosphere, excellent ventilation, pest control, etc.



|                                                                                                                                                                                                       |                                                                                                                                                                            |                                                                                                                                                                   |                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>END SUCTION &amp; SPLIT CASE PUMPS</b><br/>VERTICAL TURBINE FIRE PUMP<br/>MENA MECHANICAL INDUSTRIES- UAE</p> |  <p><b>DIESEL DRIVER</b><br/>KIRLOSKAR, INDIA<br/>UL LISTED &amp; FM APPROVED</p>         |  <p><b>DIESEL DRIVER</b><br/>NM FIRE, CHINA<br/>UL LISTED &amp; FM APPROVED</p> |  <p><b>DIESEL DRIVER</b><br/>GREAVES COTTON<br/>UL LISTED &amp; FM APPROVED</p> |
|  <p><b>DIESEL DRIVER</b><br/>TAIDONG, CHINA<br/>UL LISTED LISTED</p>                                                 |  <p><b>DIESEL DRIVER</b><br/>CLARKE, UK /USA<br/>UL LISTED &amp; FM APPROVED</p>          |  <p><b>FIRE PUMP MOTOR</b><br/>WEG, BRAZIL<br/>UL LISTED APPROVED</p>           |  <p><b>FIRE PUMP MOTOR</b><br/>MARATHON, USA<br/>UL LISTED</p>                  |
|  <p><b>FIRE PUMP CONTROLLERS</b><br/>TORNATECH, CANADA UL LISTED &amp; FM APPROVED</p>                               |  <p><b>PRESSURE RELIEF VALVE</b><br/>SINGER VALVE, CANADA UL LISTED &amp; FM APPROVED</p> |  <p><b>FIRE PUMP MOTOR</b><br/>TECHTOP, INC<br/>UL LISTED APPROVED</p>          |  <p><b>FLOWMETER</b><br/>GERAND, USA FM APPROVED</p>                            |
| <div> <div>VENDORS</div> <div></div> </div>                                                                                                                                                           |                                                                                                                                                                            |  <p><b>AMERILLO GEARS - USA</b></p>                                           |  <p><b>AMERILLO GEARS - USA</b></p>                                           |

# THE COMPANY

Since 2017, our Headquarters has been located in the Emirate of Dubai. MENA MECH IND CO is charged with an ambitious growth with the mission to protect people of the United Arab Emirates, and middle east Countries by providing world-class fire pump solutions manufacture by MENA MECH IND CO.

**Mena** is efficiently covering its Services by having a regional office in Egypt, Sudan and various other locations in the Middle East.

**Mena Mech IND CO** is the sole distributor throughout the Gulf Countries for its products, which are approved from Civil defense in many countries including UAE.

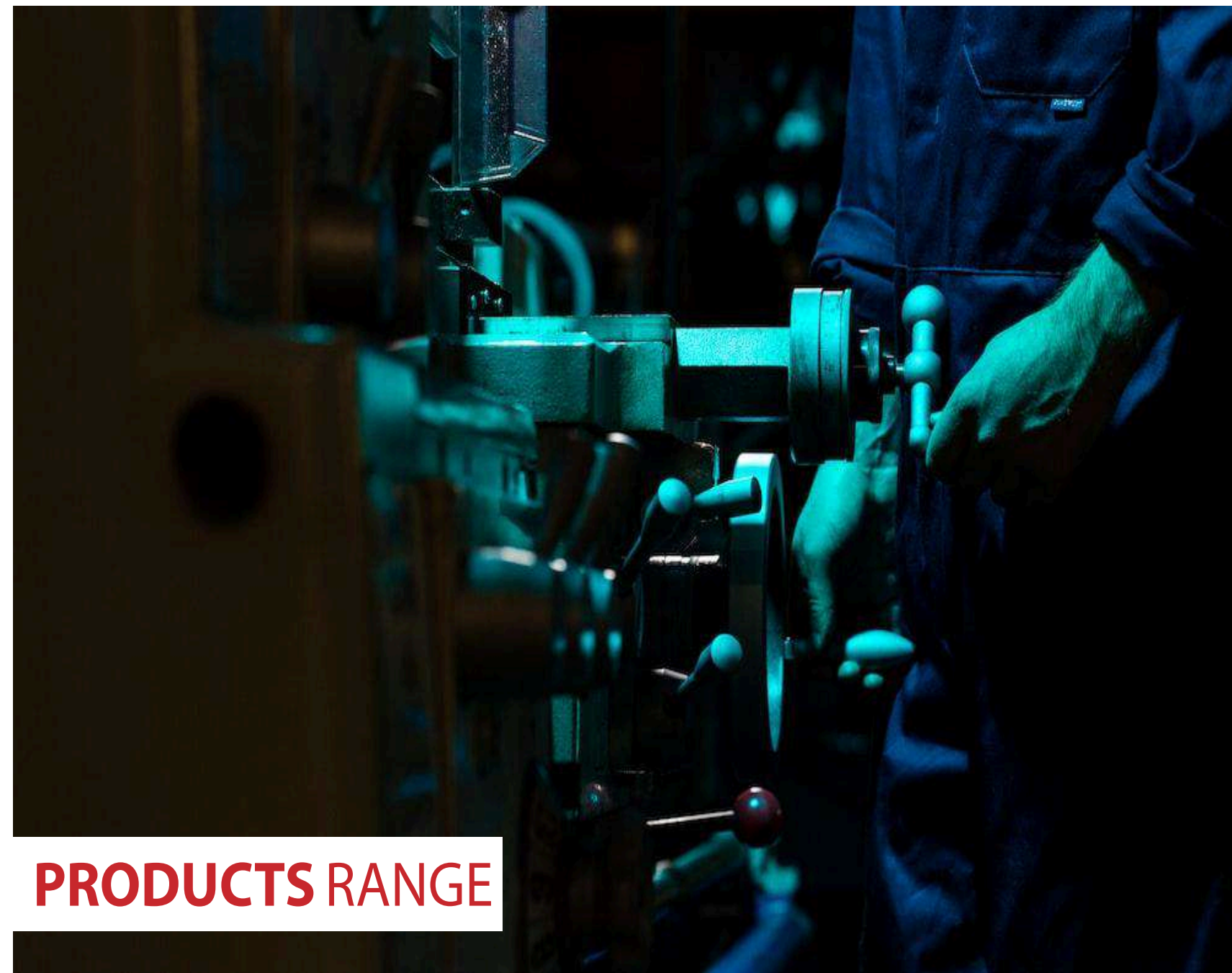
This company profile includes a complete illustration and real pictures of production process, starting from engineering, casting, machining, manufacturing, and ending with assembly.

The experts of MENA MECH IND CO are well managed, dedicated and well-versed with knowledge research and development in all aspects of Pumping Solutions. They are also supported with a qualified team of engineers and technicians with years of experiences to provide the best quality service to clients. and has an outstanding track record of delivering products on time and are punctual in providing services at regular intervals; this has been the bases of establishing a strong relationship with the clients.

**MENA MECH IND CO** has a well-equipped workshop for maintenance service as per International standards.

**MENA MECH IND CO** commits to consistently demonstrate the highest ethical standards in our actions through innovative solutions, honoring our agreements and being transparent in our communications.

Our value and service meets our customer expectations because we build and maintain a good relationship with them to ensure long-term satisfaction.

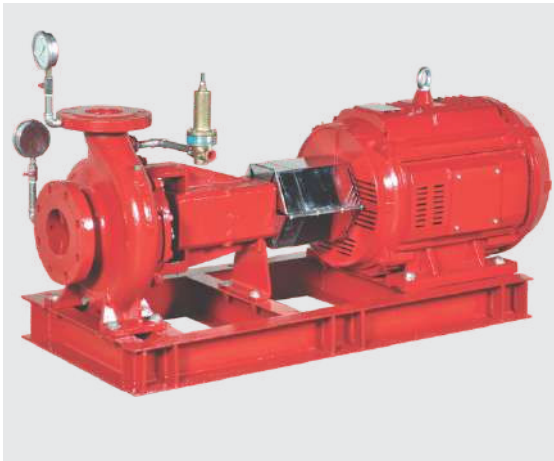


# PRODUCTS RANGE

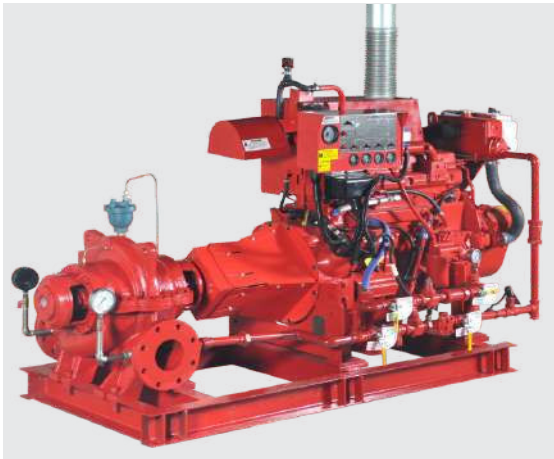
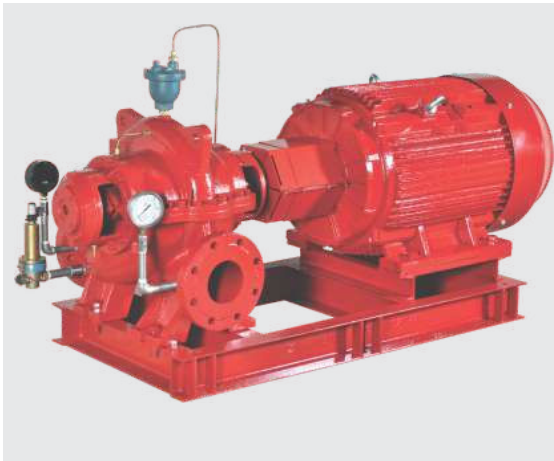
Vertical Turbine Fire Pumps



Horizontal End Suction



Horizontal Split Case



## Product Range Overview

- UL Listed Horizontal End Suction Fire Pumps
- UL Listed Horizontal Split Case Fire Pumps
- UL Listed Vertical Turbine Fire Pumps
- UL/FM Industrial Packaged Fire Pump Set
- Diesel Engine Driven Pump Set
- Electric Motor Driven Pump Set
- Jockey Pump
- Fire Pump Packaged as per NFPA

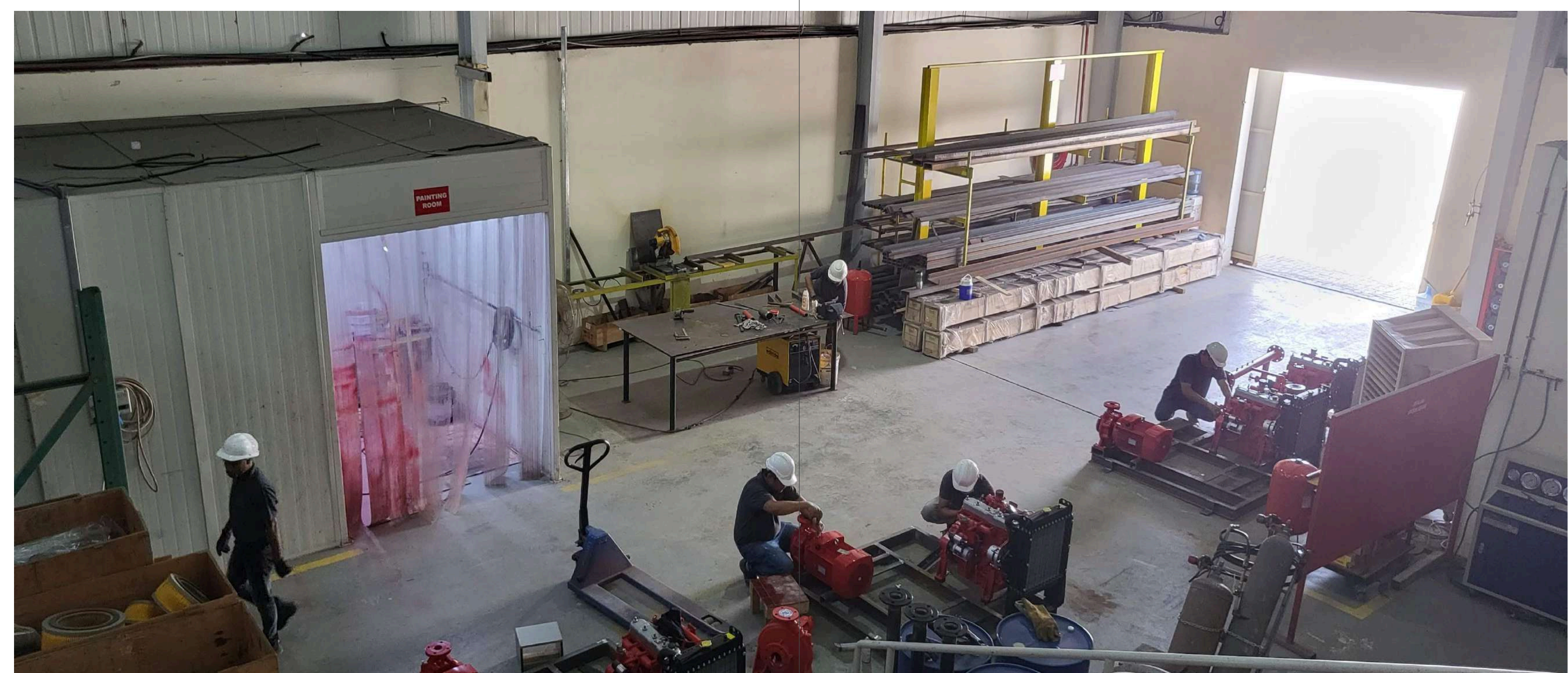




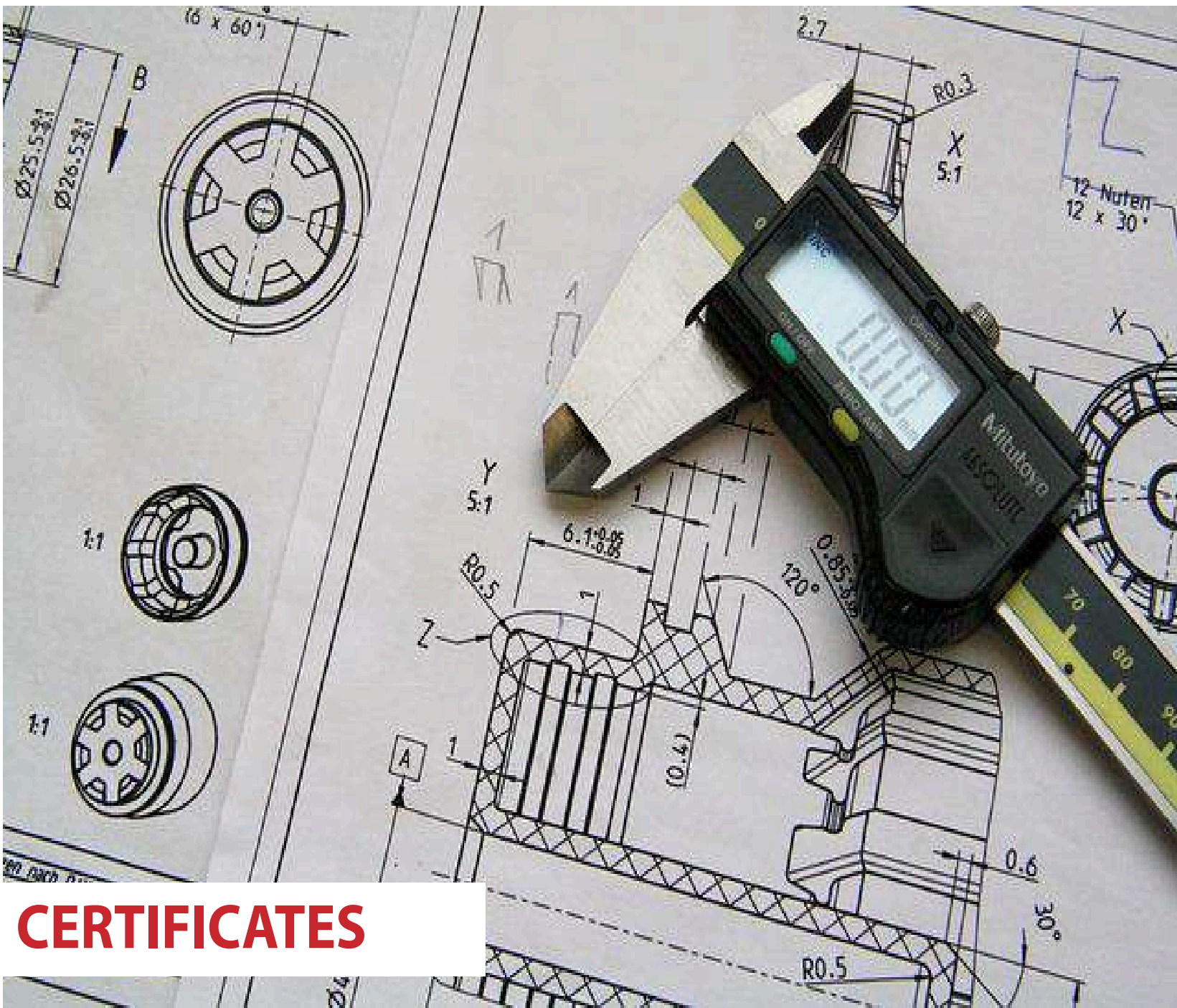
# PRODUCTION CAPABILITIES











# CERTIFICATES

## CERTIFICATE OF COMPLIANCE

Certificate Number EX28929  
Report Reference EX28929  
Issue Date 2023-JANUARY-04

Issued to: MENA MECH IND CO.  
Sharjah Al Sajaa Industrial Shed 6  
Victory Warehouse, Sajja New Industrial Area  
Sharjah, United Arab Emirates

This certificate confirms that representative samples of Centrifugal Fire Pumps, End Suction  
See Addendum for Models

Have been evaluated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: ANSI/CAN/UL 448 – Centrifugal Stationary Pumps for Fire-Protection Service

Additional Information: See UL Product iQ® at <https://iq.ulprospector.com> for additional information.

This Certificate of Compliance indicates that representative samples of the product described in the certification report have met the requirements for UL certification. It does not provide authorization to apply the UL Mark. Only the Authorization Page that references the Follow-Up Services Procedure for ongoing surveillance provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Deborah Jennings-Gower, VP Regulatory Services  
UL LLC

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CERTIFICATE OF COMPLIANCE

Certificate Number EX28977  
Report Reference EX28977-2023-04-05  
Issue Date 2023-APRIL-18

Issued to: MENA MECH IND CO.  
Sharjah Al Sajaa Industrial Shed 6  
Victory Warehouse, Sajja New Industrial Area  
Sharjah, United Arab Emirates

This certificate confirms that  
representative samples of Centrifugal Fire Pumps, Split Case  
See Addendum for Models

Have been evaluated by UL in accordance with the  
Standard(s) indicated on this Certificate.

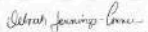
Standard(s) for Safety: ANSI/CAN/UL 448 – Centrifugal Stationary Pumps for Fire-  
Protection Service

Additional Information: See UL Product iQ® at <https://iq.ulprospector.com> for  
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Deborah Jennings, Corner, VP Regulatory Services  
UL LLC

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contact UL Customer Service at <http://ul.com/askulhelpdesk>



UL Product iQ®



Centrifugal Fire Pumps, Vertical Turbine

COMPANY

Volute Engineering Pvt Ltd

No. 37, Muthiya Mudali Second Street  
Royapettah  
Chennai, Tamil Nadu 600014 India

EX28924

Trademark and/or Tradename: "VOLUTE" ,



Note: For additional marking information, refer to the [Guide Information Page](#).

View model for additional information

**Centrifugal Fire Pumps, Vertical Turbine**, Model(s): [VT100-155](#), [VT125-180](#), [VT145-270](#), [VT150-265](#), [VT170-304](#), [VT185-335](#), [VT200-350](#), [VT225-400](#), [VT250-400](#), [VT275-430](#), [VT80-145](#)

Last Updated on 2023-01-03

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL Solutions' Follow - Up Service. Only those products bearing the UL Mark should be considered to be Certified and covered under UL Solutions' Follow - Up Service. Always look for the Mark on the product.

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# PROJECTS REFERENCE

| Sr No. | Project Details (2022)         |                                                 |                                            |                                       |              | Capacity      |            |
|--------|--------------------------------|-------------------------------------------------|--------------------------------------------|---------------------------------------|--------------|---------------|------------|
|        | Client                         | Main Contractor                                 | Consultant                                 | Project Name                          | Location     | Flow (US GPM) | Head (Bar) |
| 1      | Sheikh Mohamed Zayed Al Nehyan | Miami Contracting Company                       | Development Engineering Consultant         | G+M+4 Commercial Office Building      | Dubai        | 500           | 10         |
| 2      | Ismail Abdullah Al - Gergawi   | Talai Contracting                               | Fourth Dimension Engineering Consultant    | Commercial Building                   | Dubai        | 500           | 9          |
| 3      | Al Bahidh General Trading LLC  | Quick Steel Building Contracting LLC            | Capital Engineering Consultant             | G+M Cold Storage Building             | Dubai        | 750           | 7          |
| 4      | Mrs. Hawa Abdullah             | Abdullah Bin Dasmal Contracting                 | Circle Engineering Consultant              | G+3+R Residential Building, Muhaisnah | Dubai        | 750           | 8          |
| 5      | Mr. Hassan Arab Darwish        | Remal Al Sahra Building Contracting Company LLC | Sharjah Engineering Consultant             | G+1 Commercial Building               | Sharjah      | 300           | 9          |
| 6      | Mr. Hassan Arab Darwish        | Remal Al Sahra Building Contracting Company LLC | Sharjah Engineering Consultant             | G+3 Commercial Buildindg              | Sharjah      | 300           | 9          |
| 7      | Mr. Essa Abdulla Buhumaid      | Solid Building Contracting LLC                  | Retaj Engineering Consultancy              | G+M Warehouse & G+M Office            | Dubai        | 500           | 9          |
| 8      | Mr. Younis Abdelaziz Al Nimr   | Ideal Building Contracting                      | Emirates Engineer Consultant               | G+5 Residential Building              | Sharjah      | 500           | 10         |
| 9      | H.H Saud bin Rashid Al Mualla  | Zamalek Contracting                             | ATI Engineer Consultant                    | Commercial Building / School          | Umm Al Quain | 1500          | 9          |
| 10     | Mr. Mohammed Abdulazez Ahmad   | Hilal Al Emarate Contracting                    | High Arc Engineering Consultants           | G+5 Residential Building              | Sharjah      | 500           | 10         |
| 11     | Shaikha Moudi Hamad Al Shami   | Remal Al Sahra Contracting                      | Al Bait Engineering Consultants            | G+2 building                          | Sharjah      | 500           | 9          |
| 12     | Al Fahim Group                 | Hamed El Sayah Contracting                      | MAZ Engineering Consultant                 | Industrial Garage                     | Dubai        | 300           | 9          |
| 13     | Ms. Metha Ahmed Ali Al Weis    | Al Muntaser Building Contracting                | Arabic Architechure Engineering Consultant | Commercial Building G+4 TYP           | Dubai        | 750           | 10         |





## CONSULTANTS



## OUR CLIENTS



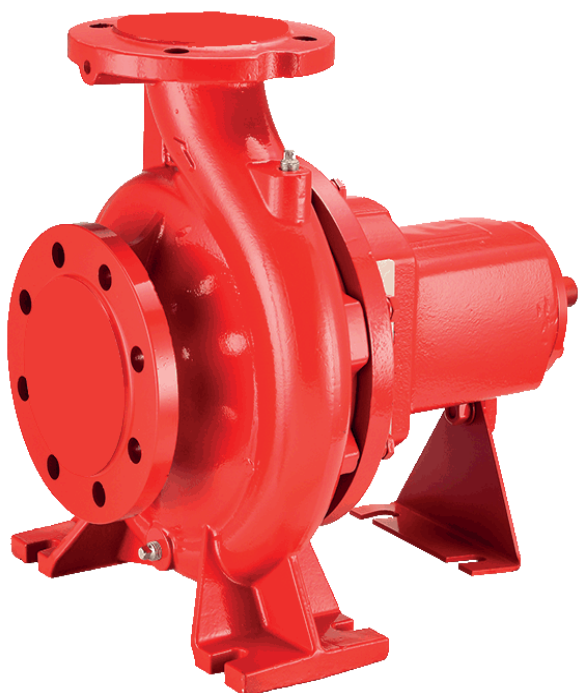
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|---------------|--|---------------------|--|
|               |  | Vendor Ref. No.     |  |
|               |  |                     |  |
|               |  | Contractor Ref. No. |  |
| Project Name: |  | Contractor Job No.  |  |

DIESEL ENGINE DRIVEN PUMP  
SPECIFICATIONS

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

## END SUCTION FIRE PUMP

## END SUCTION FIRE PUMP



### Technical Specifications

|                    |             |
|--------------------|-------------|
| Suction fange      | 1.5-6 Inch  |
| Discharge fange    | 2.5-4 inch  |
| Flow               | 50-1000 GPM |
| Discharge pressure | 84-230PSI   |

### Material Specifications

|                          |                           |
|--------------------------|---------------------------|
| Casing                   | Ductile Iron              |
| Impeller                 | Bronze or stainless steel |
| Shaft                    | ATSM420                   |
| Sealing                  | Gland packing             |
| Bearing Housing          | Rolling bearing           |
| Suction/discharge fanges | ANSI                      |

### Pump Naming

**VES 80-250**

Nominal impeller diameter (mm)

Discharge fange DN (mm)

Pump type

**VESD150-80-250**

Nominal impeller diameter (mm)

Discharge fange DN (mm)

Pump Type

### Product Standard

UL 448, NFPA

### Product Approvals



### Flange Standards

Pump Installing Dimensions are confirming to ISO2858 Standard, and Tested according to with UL 448 -2013

### Driver Options



Electrical



Diesel

### Application Areas



Hydrant



Sprinkler



Overflow



Foam

### Risk Class



Ordinary

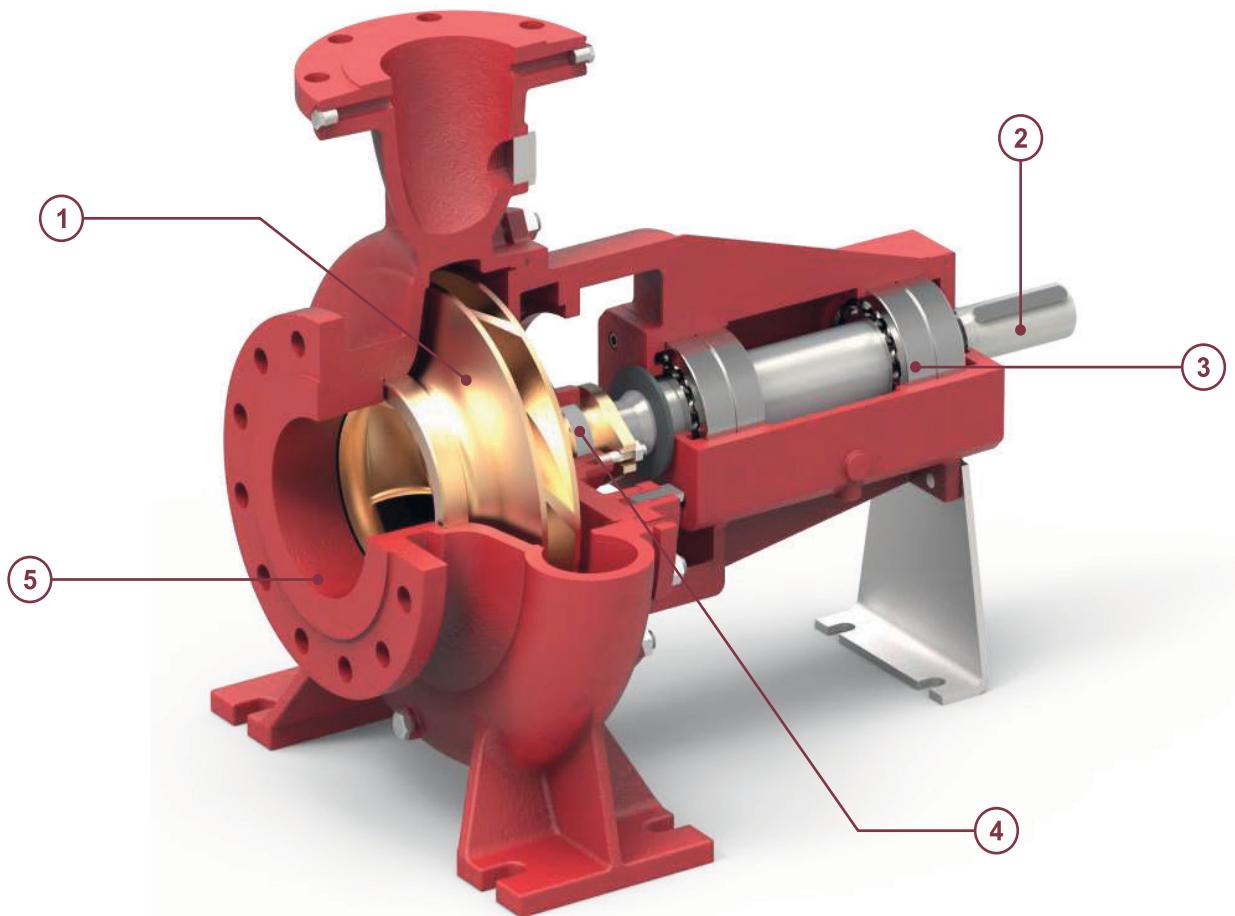


High



# END SUCTION FIRE PUMP

## General Pump Features



END SUCTION FIRE PUMP

### 1 - Impeller & Casing

- Impeller is dynamically balanced to grade G6.3 balance quality in accordance to ISO 1940-1.
- Impeller & Casing are designed using state of art CFD tools to ensure optimal performance.

### 2 - Shaft

- Heavy duty stainless steel shaft completely sealed and dry for zero corrosion available upon request.
- Short and rigid with negligible vibrations.
- Replaceable shaft protecting sleeves.
- No threads exposed to pump medium, long operating life and no corrosion.
- Adjustment-free assembly.

### 3 - Bearing

- Heavy duty and permanently grease lubricated antifriction bearings for long service life.
- Open gland, enough space for service activities.

### 4 - Seal

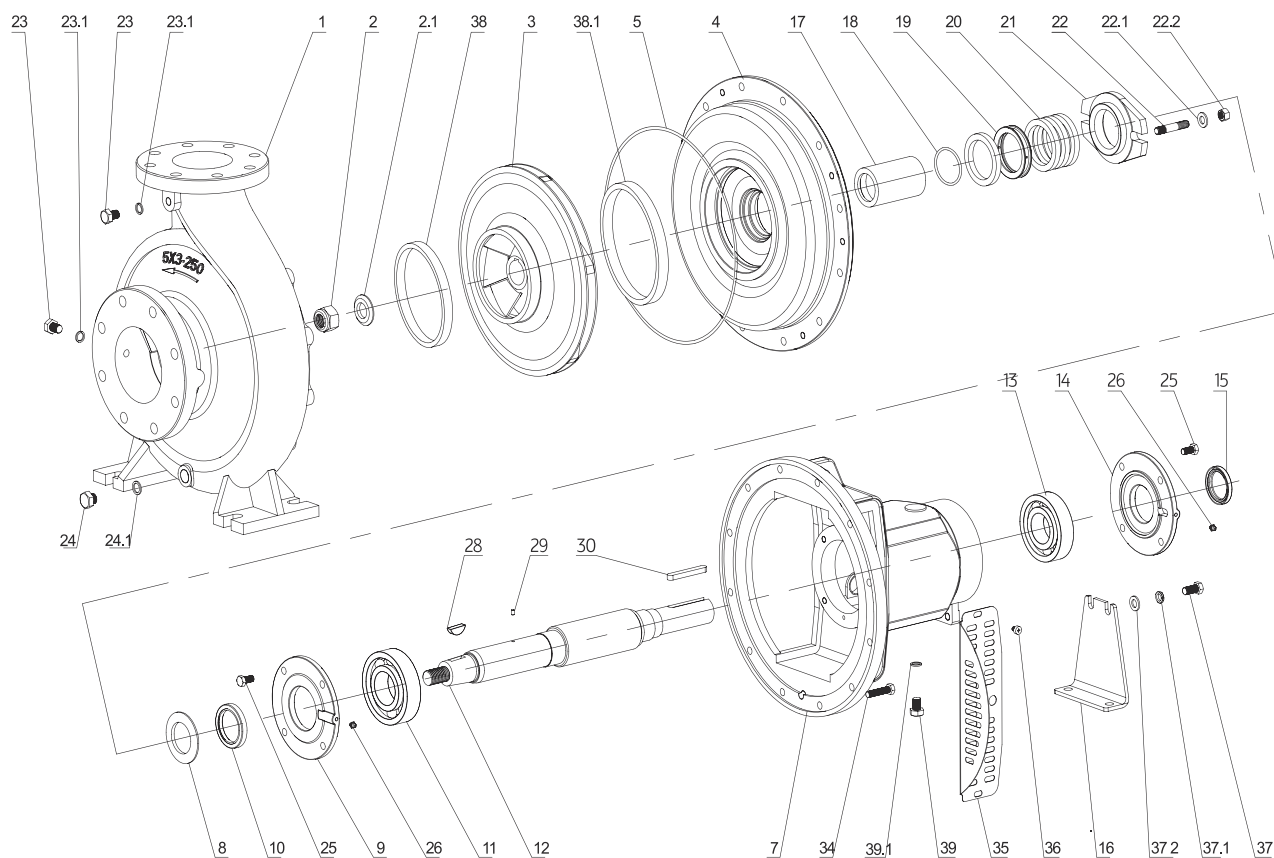
- Asbestos - free, soft packed stuffing boxes.

### 5 - Casing

- End Suction backpullout design permits maintenance of the pump without removing the pipes.
- Rugged Ball Bearings on Drive as well as Non Drive end.
- Flange drilled as per ANSI B16.1 class 250.
- Smooth surface inside & CED coated for superior corrosion protection.
- Replaceable wear ring protect the casing and the impeller running clearances.
- Heavy duty casing design for high working pressure.

# END SUCTION FIRE PUMP

## VES Series - Exploded View & Part list



END SUCTION FIRE PUMP

| Code | Part Name                |
|------|--------------------------|
| 1    | Casing                   |
| 2    | Impeller Nut             |
| 2.1  | Lock washer for impeller |
| 3    | Impeller                 |
| 4    | Gland Cover              |
| 5    | O-ring                   |
| 7    | Bearing Housing          |
| 8    | Rubber Slinger           |
| 9    | NDE Bearing Cover        |
| 10   | NDE Oil Seal             |
| 11   | NDE Bearing              |
| 12   | Shaft                    |
| 13   | DE Bearing               |
| 14   | DE Bearing Cover         |
| 15   | DE Oil Seal              |

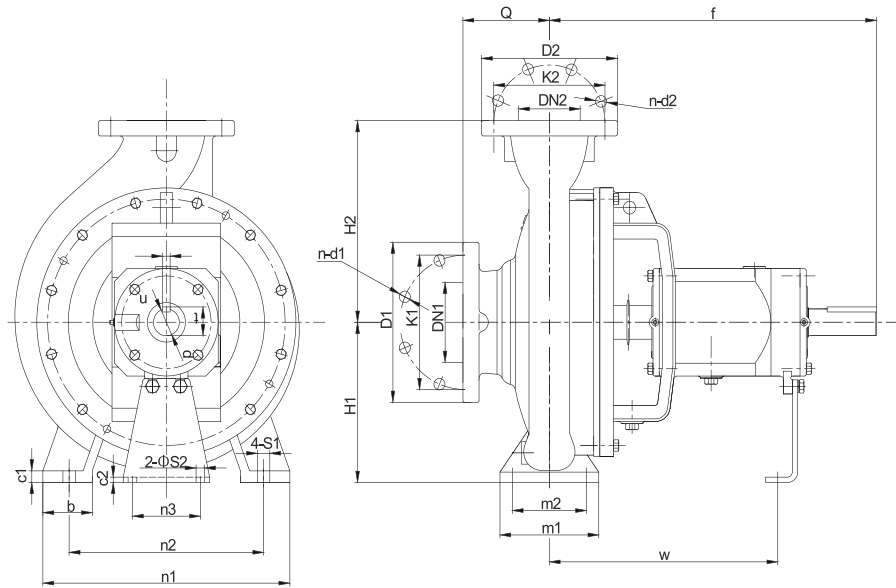
| Code | Part Name         |
|------|-------------------|
| 16   | Support Foot      |
| 17   | Packing Sleeve    |
| 18   | O-ring            |
| 19   | Gland Packing     |
| 20   | Packing Seal Cage |
| 21   | Gland Cover       |
| 22   | Stud Bolt         |
| 22.1 | Flat Washer       |
| 22.2 | Screw Nut         |
| 23   | Plug              |
| 23.1 | Plug Spacer       |
| 24   | Plug              |
| 24.1 | Plug Spacer       |
| 25   | Screw Bolt        |

| Code | Part Name        |
|------|------------------|
| 26   | Oil Cup M6       |
| 28   | key              |
| 29   | pin              |
| 30   | key              |
| 34   | Screw Bolt       |
| 35   | Protective cover |
| 36   | Bolt             |
| 37   | Screw Bolt       |
| 37.1 | Elastic Washer   |
| 37.2 | Flat Washer      |
| 38   | Front-Wearing    |
| 38.1 | Back-Wearing     |
| 39   | Plug             |
| 39.1 | Plug Spacer      |

# END SUCTION FIRE PUMP

## VES SERIES INSTALLATION DIMENSION

### END SUCTION FIRE PUMP



| Model       | DN1  |     | DN2  |     | Impeller Dia. | Shaft No. | a   | f   | h1  | h2  | b  | m1  | m2  | n1  | n2  | n3  | c1 | c2 | w   | S1  | S2  | d  | t  | u  | l   | Weight (kg) |
|-------------|------|-----|------|-----|---------------|-----------|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|----|----|-----|-----|-----|----|----|----|-----|-------------|
|             | inch | mm  | inch | mm  |               |           |     |     |     |     |    |     |     |     |     |     |    |    |     |     |     |    |    |    |     |             |
| 40-250      | 2.5" | 65  | 1.5" | 40  | 250           | 2         | 100 | 500 | 180 | 225 | 65 | 125 | 95  | 320 | 250 | 110 | 14 | 6  | 370 | M12 | M12 | 32 | 35 | 10 | 80  | 71          |
| 50-250      | 3"   | 80  | 2"   | 50  | 250           | 2         | 125 | 500 | 180 | 225 | 65 | 125 | 95  | 320 | 250 | 110 | 15 | 6  | 370 | M12 | M12 | 32 | 35 | 10 | 80  | 76          |
| 65-250      | 4"   | 100 | 2.5" | 65  | 250           | 2         | 125 | 500 | 200 | 250 | 80 | 160 | 120 | 360 | 280 | 110 | 16 | 6  | 370 | M16 | M12 | 32 | 35 | 10 | 80  | 84          |
| 80-250      | 5"   | 125 | 3"   | 80  | 250           | 2         | 125 | 500 | 225 | 280 | 80 | 160 | 120 | 400 | 315 | 110 | 18 | 6  | 370 | M16 | M12 | 32 | 35 | 10 | 80  | 88          |
| 80-315      | 5"   | 125 | 3"   | 80  | 315           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |
| 100-315     | 5"   | 125 | 4"   | 100 | 315           | 3         | 140 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 19 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 138         |
| 100-250     | 5"   | 125 | 4"   | 100 | 315           | 3         | 140 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 19 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 138         |
| 100-200     | 5"   | 125 | 4"   | 100 | 315           | 3         | 140 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 19 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 138         |
| 80-200      | 5"   | 125 | 3"   | 80  | 315           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |
| 150-100-200 | 6"   | 150 | 4"   | 100 | 200           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |
| 150-100-315 | 6"   | 150 | 4"   | 100 | 315           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |

| Flange standard : ASTM B16.42-1998 Class150 |         |         |         |         |         | Flange standard : ASTM B16.42-1998 Class300 |         |         |         |
|---------------------------------------------|---------|---------|---------|---------|---------|---------------------------------------------|---------|---------|---------|
| DN1/DN2                                     | 1.5"    | 2"      | 2.5"    | 3"      | 4"      | 5"                                          | 3"      | 4"      | 5"      |
| D1/D2                                       | 127     | 152.4   | 177.8   | 190.5   | 228.6   | 254                                         | 209.6   | 254     | 279.4   |
| K1/K2                                       | 98.6    | 120.7   | 139.7   | 152.4   | 190.5   | 215.9                                       | 168.1   | 200.2   | 234.9   |
| n-d1/ n-d2                                  | 4-φ15.7 | 4-φ19.1 | 4-φ19.1 | 4-φ19.1 | 8-φ19.1 | 8-φ22.4                                     | 8-φ22.4 | 8-φ22.4 | 8-φ22.4 |



### FIRE PUMP SKIDS

MENA MECH IND CO is an established well reputed manufacturer of Premium Custom Engine Driven Centrifugal Fire Pump Skids. We specialized in designing and developing packages in compliance to NFPA 20 requirements with Listed & Approved Drivers.

MENA offers listed Centrifugal Fire Pump Skids that meet every fire protection need.

- Driven by Listed & Approved Diesel Engines or Electric Motors.
- Well aligned and Coupled for Direct Operation.
- Skid Packages are Pre-Tested and Inspected thoroughly before release to customers.
- One piece base plate with Anchor Bolt holes.
- Engineered, coated, hot rolled mild steel to resist corrosion and abrasion.
- Heavy Fabricated C-Channel Structure constructed to provide proper alignment of Pump with Diesel Engine or Pump with Motor.
- Compact skid Design with Small Foot-Print for Retrofit.
- High standard of Quality in material Construction finish and Workmanship.

## DIESEL DRIVEN SKIDS

MENA maintains its standard with using it's proudly own listed & approved Black Stallion Diesel Engines and Centrifugal Fire Pumps to package Heavy Duty and High Quality Compact Skids.

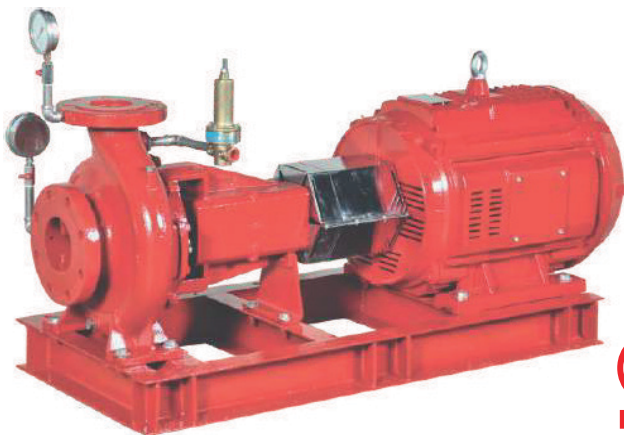
Our Listed and Approved Fire Pumps can also be coupled with any other Listed Diesel Engine of any specific brand as per customers requirement.



## MOTOR DRIVEN SKIDS

MENA maintains its standard with using WEG which is High Efficiency Fire Pump Motors with our own Listed and Approved Centrifugal Fire Pumps to package Heavy Duty and High Quality Compact Skids.

Our Listed and Approved Fire Pumps can also be coupled with any other Listed Fire Pump Motors of any specific brand as per client requirement.



## END SUCTION -RANGE

### APPROVED UL LISTING RANGE

| Rated Capacity, US GPM | Size, In. | Model            | Pressure Rating, psi | Approx Speed RPM | Maximum Working Pressure Psi |
|------------------------|-----------|------------------|----------------------|------------------|------------------------------|
| 50                     | 2.5×1.5   | VES 40-250       | 101 - 142            | 2900             | 200                          |
| 50                     | 2.5×1.5   | VES 40-250       | 144 - 207            | 3500             | 290                          |
| 100                    | 2.5×1.5   | VES 40-250       | 97 - 140             | 2900             | 200                          |
| 100                    | 2.5×1.5   | VES 40-250       | 140 - 203            | 3500             | 290                          |
| 150                    | 2.5×1.5   | VES 40-250       | 87 - 131             | 2900             | 200                          |
| 150                    | 2.5×1.5   | VES 40-250       | 133 - 196            | 3500             | 290                          |
| 150                    | 3×2       | VES 50-250       | 104 - 147            | 2980             | 225                          |
| 150                    | 3×2       | VES 50-250       | 144 - 202            | 3500             | 290                          |
| 200                    | 3×2       | VES 50-250       | 101 - 145            | 2980             | 225                          |
| 200                    | 3×2       | VES 50-250       | 140 - 200            | 3500             | 290                          |
| 250                    | 3×2       | VES 50-250       | 97 - 140             | 2980             | 225                          |
| 250                    | 3×2       | VES 50-250       | 136 - 196            | 3500             | 290                          |
| 250                    | 4×2.5     | VES 65-250       | 131 - 207            | 3500             | 290                          |
| 300                    | 4×2.5     | VES 65-250       | 89 - 142             | 2900             | 225                          |
| 300                    | 4×2.5     | VES 65-250       | 130 - 206            | 3500             | 290                          |
| 400                    | 4×2.5     | VES 65-250       | 82 - 137             | 2900             | 225                          |
| 400                    | 4×2.5     | VES 65-250       | 125 - 203            | 3500             | 290                          |
| 400                    | 5×3       | VES 80-200       | 89 - 141             | 3500             | 225                          |
| 400                    | 5×3       | VES 80-250       | 88 - 140             | 2900             | 225                          |
| 400                    | 5×3       | VES 80-250       | 128 - 207            | 3500             | 290                          |
| 450                    | 5×3       | VES 80-200       | 86 - 139             | 3500             | 225                          |
| 450                    | 5×3       | VES 80-250       | 86 - 140             | 2900             | 225                          |
| 450                    | 5×3       | VES 80-250       | 127 - 206            | 3500             | 290                          |
| 450                    | 5×3       | VES 80-315       | 131 - 207            | 2900             | 290                          |
| 450                    | 5×4       | VES 100-200      | 88 - 143             | 3500             | 225                          |
| 450                    | 5×4       | VES 100-250      | 83 - 135             | 2900             | 290                          |
| 450                    | 5×4       | VES 100-250      | 123 - 198            | 3500             | 290                          |
| 450                    | 5×4       | VES 100-315      | 133 - 210            | 2900             | 290                          |
| 450                    | 5×4       | VES 100-315      | 140 - 222            | 2980             | 290                          |
| 500                    | 5×3       | VES 80-200       | 83 - 136             | 3500             | 225                          |
| 500                    | 5×3       | VES 80-250       | 84 - 139             | 2900             | 225                          |
| 500                    | 5×3       | VES 80-250       | 125 - 205            | 3500             | 290                          |
| 500                    | 5×3       | VES 80-315       | 127 - 204            | 2900             | 290                          |
| 500                    | 5×4       | VES 100-200      | 88 - 141             | 3500             | 225                          |
| 500                    | 5×4       | VES 100-250      | 83 - 134             | 2900             | 290                          |
| 500                    | 5×4       | VES 100-250      | 122 - 198            | 3500             | 290                          |
| 500                    | 5×4       | VES 100-315      | 132 - 209            | 2900             | 290                          |
| 500                    | 5×4       | VES 100-315      | 139 - 221            | 2980             | 290                          |
| 500                    | 6×4       | VESD 150-100-200 | 116 - 142            | 3500             | 225                          |
| 500                    | 6×4       | VESD 150-100-315 | 119 - 192            | 2900             | 250                          |
| 750                    | 5×4       | VES 100-200      | 82 - 138             | 3500             | 225                          |
| 750                    | 5×4       | VES 100-250      | 74 - 128             | 2900             | 290                          |
| 750                    | 5×4       | VES 100-250      | 115 - 191            | 3500             | 290                          |
| 750                    | 5×4       | VES 100-315      | 125 - 202            | 2900             | 290                          |
| 750                    | 5×4       | VES 100-315      | 133 - 214            | 2980             | 290                          |
| 750                    | 6×4       | VESD 150-100-200 | 112 - 137            | 3500             | 225                          |
| 750                    | 6×4       | VESD 150-100-315 | 113 - 186            | 2900             | 250                          |
| 1000                   | 6×4       | VESD 150-100-200 | 99 - 128             | 3500             | 225                          |
| 1000                   | 6×4       | VESD 150-100-315 | 101 - 173            | 2900             | 250                          |

LISTING RANGE





|               |  |                    |  |
|---------------|--|--------------------|--|
|               |  | Vendor Ref. No.    |  |
|               |  |                    |  |
|               |  | Contractor Ref. No |  |
|               |  |                    |  |
| Project Name: |  | Contractor Job No. |  |

DIESEL ENGINE SPECIFICATIONS

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |





## UL Listed Fire Pump Engines 24HP-262HP

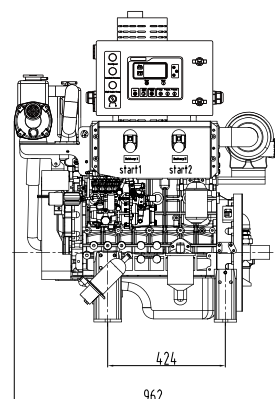
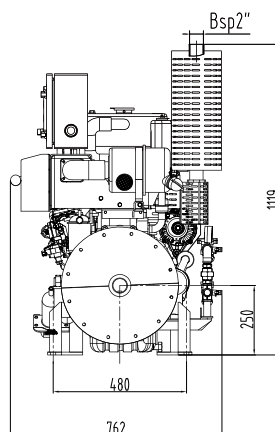
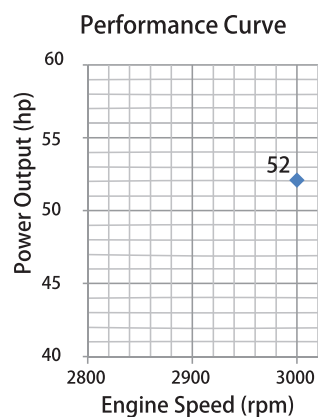
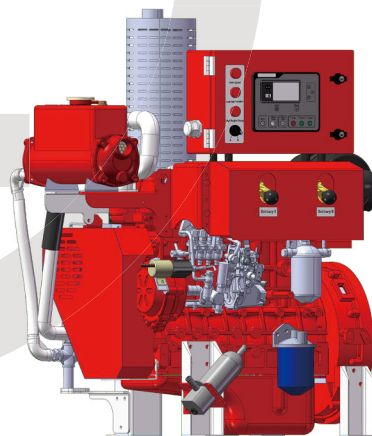
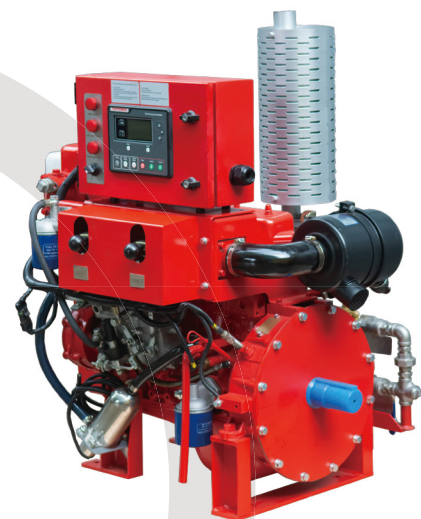
### Specification

|                                  |                                                       |         |
|----------------------------------|-------------------------------------------------------|---------|
| Engine Model                     | 490HE                                                 |         |
| Engine Type                      | Vertical, Water-cooling<br>4-stroke, direct-injection |         |
| Cooling Method                   | Heat Exchanger                                        |         |
| Aspiration                       | Natural                                               |         |
| Number of Cylinders              | 4                                                     |         |
| Bore x Stroke (mm)               | 90*105                                                |         |
| Compression Ratio                | 18:1                                                  |         |
| Total Displacement(L)            | 2.67                                                  |         |
| Net Power                        | KW/HP                                                 | 38.2/52 |
| Rated Speed                      | r/min                                                 | 3000    |
| Rated Torque                     | N.m                                                   | ≥136    |
| Fuel Consumption                 | Gal/hr                                                | 3.35    |
| Rotating Direction at Output End | Counter-clockwise                                     |         |
| Lubrication Oil Standard         | CD15W/40                                              |         |
| Lubrication Oil Content          | L                                                     | 7       |
| Lubrication Method               | Pressure and Splash                                   |         |
| Starting Method                  | Electric 24V                                          |         |
| PTO Type                         | Stub Shaft                                            |         |
| Net Weight                       | kgs                                                   | 360     |

### Engine Ratings Baselines

Engines are not to be used for continuous duty. Engines are to be used only for stationary emergency standby fire pump.

Engines are rated at standard SAE conditions of 29.61 in. (7,521 mm) Hg barometer and 77°F (25°C) inlet temperature (approximates 300ft. (91.4m) above sea level)





## UL Listed Fire Pump Engines 24HP-262HP

| General Engine Data Sheet                      |                                     |
|------------------------------------------------|-------------------------------------|
| Engine Model                                   | 490HE                               |
| Ignition Type                                  | Compression ( Diesel )              |
| Number of Cylinders                            | 4                                   |
| Bore and Stroke - mm(inch)                     | 90 x 105 (3.54x4.13)                |
| Displacement - L(inch <sup>3</sup> )           | 2.67(162.75)                        |
| Compression Ratio                              | 18.0 : 1                            |
| Valve per cylinder - Intake                    | 1                                   |
| Exhaust                                        | 1                                   |
| Combustion System                              | Direct Injection                    |
| Engine Type                                    | In-Line, 4 Stroke, Direct injector  |
| Aspiration                                     | Nature intake                       |
| Firing Order                                   | 1-3-4-2                             |
| Charge Air Cooling Type                        | Nature                              |
| Rotation(Viewed from Flywheel end) - Clockwise | Counter-Clockwise                   |
| Engine Crankcase Vent System                   | Open                                |
| Installation Drawing                           | 490HE-01(refer to Opertaion manual) |
| Power Rating - Approved                        |                                     |
| Engine Nameplate Power - HP(kW)                | 52(38.2)                            |
| Max Power - HP(kW)                             | 57(42)                              |
| Speed - r/min                                  | 3000                                |
| Cooling system                                 |                                     |
| Engine Coolant Heat - Btu/sec(kW)              | 27.78( 26.16)                       |
| Engine Radiated Heat - Btu/sec(kW)             | 19.67 ( 20.85 )                     |
| Heat Exchanger minimum Flow                    |                                     |
| 60°F (16°C) Raw Water - US.gal/min (LPM)       | 6.6( 25)                            |
| 100°F (38°C) Raw Water - US.gal/min (LPM)      | 9.5 ( 36 )                          |
| Heat Exchanger Maximum Cooling Water           |                                     |
| Inlet Pressure - lb/in <sup>2</sup> (bar)      | 13.8 ( 2 )                          |
| Flow - gal/min (LPM)                           | 9.5 ( 36)                           |
| Raw water inlet size- Inch                     | BSP1                                |
| Raw water outlet size- Inch                    | BSP1¼                               |
| Thermostat, Start to Open - °F (°C)            | 149 ( 65 )                          |



## UL Listed Fire Pump Engines 24HP-262HP

|                                                                                              |                |
|----------------------------------------------------------------------------------------------|----------------|
| Fully Opened - °F (°C)                                                                       | 167 ( 75 )     |
| Engine Coolant capacity - L                                                                  | 12             |
| Engine Coolant High Temp. Switch - °F (°C)                                                   | 203 ( 95 )     |
| Engine Coolant Low Temp. Switch - °F (°C)                                                    | 120 ( 49 )     |
| Raw water High Temp. Switch - °F (°C)                                                        | 104 ( 40 )     |
| <b>Electric System - DC</b>                                                                  |                |
| System Voltage (Nominal)                                                                     | 24V            |
| Battery Capacity for Ambient above 32°F (0°C)                                                |                |
| Voltage (Nominal)                                                                            | 24V            |
| Current Capacity - Amp/hr                                                                    | 150            |
| Qty. per Battery Bank                                                                        | 1              |
| CCA @ 40°F (4.3°C)                                                                           | 320            |
| Reserve Capacity - Minutes                                                                   | 45             |
| Battery Cable Minimum Size - mm <sup>2</sup>                                                 | 35             |
| Charging Alternator Output - Amp                                                             | 26.7           |
| Starter Cranking Amps - @ 60°F (15°C)                                                        | 250-290        |
| Stop solenoid                                                                                | ETS            |
| <b>Exhaust System</b>                                                                        |                |
| Exhaust Flow - ft <sup>3</sup> /min (m <sup>3</sup> /min)                                    | 126 ( 3.57 )   |
| Exhaust Temperature - °F (°C)                                                                | 896 ( 480 )    |
| Max. Allowable Back Pressure - in H <sub>2</sub> O(kPa)                                      | 16 ( 4 )       |
| Exhaust pipe Dia. In (mm) for further exhaustpiping(Min.)                                    | 2 ( 50 )       |
| <b>Fuel System</b>                                                                           |                |
| Fuel Consumption - US.gal/hr (L/hr)                                                          | 3.35(12.97)    |
| Fuel Return - US.gal/hr (L/hr)                                                               | 0.63 ( 2.44 )  |
| Total Supply Fuel Flow - gal/hr (L/hr)                                                       | 3.98(15.1)     |
| Fuel Pressure - lb/in <sup>2</sup> (kPa)                                                     | 29 ( 200 )     |
| Fuel Supply Line Size(Min.) - in(mm)                                                         | BSP3/8 ( 9.5 ) |
| Fuel Return Line Size(Min.) - in(mm)                                                         | BSP3/8 ( 9.5 ) |
| Max. Allowable Fuel Pump Suction With CleanFilter - in H <sub>2</sub> O (m H <sub>2</sub> O) | 31 ( 0.8 )     |
| Max. Allowable Fuel Head Above Fuel Pump Supply or Return - m (ft)                           | 5 (16.4)       |
| Fuel Filter Size - Micron                                                                    | 5-10 micron    |





## ***UL Listed Fire Pump Engines 24HP-262HP***

|                                                              |                             |
|--------------------------------------------------------------|-----------------------------|
| <b>Heater System</b>                                         |                             |
| Jacket Water Heater                                          | Standard                    |
| Wattage (Nominal)                                            | 1000W                       |
| Voltage - AC, 1P                                             | 220V                        |
| <b>Air Intake System</b>                                     |                             |
| Air Cleaner Type                                             | Dry type                    |
| Air Intake Restriction Maximum Limit                         |                             |
| Dirty Air Cleaner - in H <sub>2</sub> O (kPa)                | 8 ( 2 )                     |
| Clean Air Cleaner - in H <sub>2</sub> O (kPa)                | 4 ( 1.0 ) - 5 ( 1.25 )      |
| Engine Air Flow - ft <sup>3</sup> /min (m <sup>3</sup> /min) | 112.3 (3.18 )               |
| Air Temperature(At Engine Inlet) - °F (°C)                   | 113 ( 45 ) Max. Allowable   |
| <b>Lubrication System</b>                                    |                             |
| Oil Pressure(Normal) - lb/in <sup>2</sup> (kPa)              | 36.2 to 57.9 ( 250 to 400 ) |
| Oil Temperature(In Pan) - °F (°C) (max.)                     | 239 ( 115 )                 |
| Oil Pan Capacity, High - L                                   | 7                           |
| Low - L                                                      | 6.5                         |
| Total Oil Capacity with filter - L                           | 7                           |
| <b>Performance</b>                                           |                             |
| BMEP - lb/in <sup>2</sup> (kPa)                              | 94.2-203 ( 650-1400 )       |
| Piston Speed - ft/min (m/min)                                | 2480( 630 )                 |
| Mechanical Noise - dB(A) @ 1m                                | 105 approx.                 |
| Power Curve                                                  | Refer to operation manual   |

|                                                                                   |                     |  |
|-----------------------------------------------------------------------------------|---------------------|--|
|  | Vendor Ref. No.     |  |
|                                                                                   |                     |  |
|                                                                                   | Contractor Ref. No. |  |
| Project Name:                                                                     | Contractor Job No.  |  |

# DIESEL DRIVEN PUMP CONTROLLER SPECS

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |



# TORNATECH

Project: \_\_\_\_\_

Customer: \_\_\_\_\_

Engineer: \_\_\_\_\_

Pump Manufacturer: \_\_\_\_\_

## Technical Data Submittal Document

### Model GPD

## Diesel Engine Driven Fire Pump Controller



### Contents:

Data Sheets  
Dimensional Data  
Wiring Schematics  
Field Connections

**Note:** The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.



N.Y.C.  
APPROVED



March 2024





|                                                         |                                                                                                                                                                                                                                                                                                                                     |                                                                         |                                         |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------|
| <b>Standard, Listings, Approvals and Certifications</b> | <b>Built to NFPA 20 (latest edition)</b>                                                                                                                                                                                                                                                                                            |                                                                         |                                         |
|                                                         | <b>Underwriters Laboratory (UL)</b>                                                                                                                                                                                                                                                                                                 | UL218 - Fire Pump Controllers                                           |                                         |
|                                                         | <b>FM Global</b>                                                                                                                                                                                                                                                                                                                    | Class 1321/1323                                                         |                                         |
|                                                         | <b>New York City</b>                                                                                                                                                                                                                                                                                                                | Accepted for use in the City of New York by the Department of Buildings |                                         |
|                                                         | <b>CE Mark</b>                                                                                                                                                                                                                                                                                                                      | Various EN, IEC & CEE directives and standards                          |                                         |
|                                                         | Built in Canada or U.A.E                                                                                                                                                                                                                                                                                                            |                                                                         | Built in Europe                         |
|                                                         | <input type="checkbox"/> CE Mark Option                                                                                                                                                                                                                                                                                             |                                                                         | Supplied as Standard                    |
| <b>Enclosure</b>                                        | <b>Protection Rating</b>                                                                                                                                                                                                                                                                                                            |                                                                         |                                         |
|                                                         | Built in Canada or U.A.E                                                                                                                                                                                                                                                                                                            |                                                                         | Built in Europe                         |
|                                                         | <input checked="" type="checkbox"/> <b>Standard: NEMA 2</b>                                                                                                                                                                                                                                                                         |                                                                         | <input type="checkbox"/> Standard: IP55 |
|                                                         | <b>Optional</b>                                                                                                                                                                                                                                                                                                                     |                                                                         |                                         |
|                                                         | <input type="checkbox"/> NEMA 12                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> NEMA 4X-304 sst painted                        | <input type="checkbox"/> IP54           |
|                                                         | <input type="checkbox"/> NEMA 3                                                                                                                                                                                                                                                                                                     | <input type="checkbox"/> NEMA 4X-304 sst brushed finish                 | <input type="checkbox"/> IP55           |
|                                                         | <input type="checkbox"/> NEMA 3R                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> NEMA 4X-316 sst painted                        | <input type="checkbox"/> IP65           |
|                                                         | <input type="checkbox"/> NEMA 4                                                                                                                                                                                                                                                                                                     | <input type="checkbox"/> NEMA 4X-316 sst brushed finish                 | <input type="checkbox"/> IP66           |
|                                                         | <div> <b>Accessories</b> <ul style="list-style-type: none"> <li>• Bottom entry gland plate</li> <li>• Lifting Lugs</li> <li>• Keylock handle</li> </ul> </div> <div> <b>Paint Specifications</b> <ul style="list-style-type: none"> <li>• Red RAL3002</li> <li>• Powder coating</li> <li>• Glossy textured finish</li> </ul> </div> |                                                                         |                                         |
|                                                         |                                                                                                                                                                                                                                                                                                                                     |                                                                         |                                         |
| <b>Ambient Temperature Rating</b>                       | <b>Standard</b><br><input type="checkbox"/> 4°C to 40°C / 39°F to 104°F<br><b>Optional</b><br><input type="checkbox"/> 4°C to 55°C / 39°F to 131°F<br>Controllers built in Dubai, UAE (Tornatech FZE) are supplied standard with 55°C rating.                                                                                       |                                                                         |                                         |





|                             |                                                                                                                                                                                                                                                                                               |                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| General                     | AC                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> 120V / 1ph / 60hz<br><input type="checkbox"/> 208V to 240V / 1ph / 50-60hz |
|                             | DC                                                                                                                                                                                                                                                                                            | <input type="checkbox"/> 12VDC<br><input type="checkbox"/> 24VDC                                    |
|                             | Grounding system                                                                                                                                                                                                                                                                              | • Negative                                                                                          |
|                             | Battery chargers                                                                                                                                                                                                                                                                              | • Two independent fully automatic<br>• 10A continuous charge<br>• 500mA trickle charge              |
| Electrical Reading          | • Battery 1 & Battery 2 voltage<br>• Battery 1 & Battery 2 charging amperage<br>• Charging mode                                                                                                                                                                                               |                                                                                                     |
| Pressure Reading            | • Continuous system pressure display<br>• Cut-in and cut-out pressure setting                                                                                                                                                                                                                 |                                                                                                     |
| Pressure and Event Recorder | • Pressure readings with date stamp<br>• Event recording with date stamp<br>• Under regular maintained operation, events are stored in memory for the life of the controller.<br>• Data viewable on operator interface display screen<br>• Downloadable by USB port to external memory device |                                                                                                     |



|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| <b>Pressure sensing</b>            | <ul style="list-style-type: none"> <li>• Pressure transducer and run test solenoid valve assembly for fresh water application</li> <li>• Pressure sensing connection 1/2" Female NPT</li> <li>• Drain connection 3/8"</li> <li>• Rated and calibrated for 0-500psi working pressure</li> <li>• Externally mounted with protective cover</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |
| <b>Audible Alarm</b>               | Alarm buzzer - 85dB at 3 meters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |
| <b>Visual Indications</b>          | <ul style="list-style-type: none"> <li>• Engine run</li> <li>• Main switch AUTO</li> <li>• Main switch in OFF</li> <li>• Main switch in HAND</li> <li>• Periodic test</li> <li>• Cranking Cycle</li> <li>• AC Power available</li> <li>• Pump room temperature (°F or °C)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |
| <b>Visual &amp; Audible Alarms</b> | <p>Visual only</p> <ul style="list-style-type: none"> <li>• Pump room trouble</li> <li>• Pump on demand</li> <li>• AC Failure</li> <li>• Charger 1 &amp; 2 Failure</li> <li>• Weak battery 1 &amp; 2</li> <li>• Battery 1 &amp; 2 overvoltage</li> <li>• Loss of continuity 1 &amp; 2</li> <li>• High fuel level</li> <li>• Fuel tank leak</li> <li>• PLD low suction pressure</li> <li>• High raw water temperature</li> <li>• Low pump room temperature</li> <li>• Service required</li> <li>• ECM warning</li> <li>• Weekly test cut-in not reached</li> <li>• Check weekly test solenoid</li> <li>• Pressure transducer fault</li> <li>• Invalid Cut-In</li> </ul> <p>Visual and Audible</p> <ul style="list-style-type: none"> <li>• Engine trouble</li> <li>• Controller trouble</li> <li>• Engine low oil pressure</li> <li>• Engine high temperature</li> <li>• Engine low temperature</li> <li>• Engine overspeed</li> <li>• DC Failure</li> <li>• Battery 1 &amp; 2 Failure</li> <li>• Engine fail to start</li> <li>• Low fuel level</li> <li>• ECM fault</li> <li>• ECM SS in Alternate Position</li> <li>• Fuel injection malfunction</li> </ul> |  |  |
| <b>Remote Alarm Contacts</b>       | <p>DPDT-8A-250V.AC</p> <ul style="list-style-type: none"> <li>• Engine run</li> <li>• Common controller trouble <ul style="list-style-type: none"> <li>• Charger #1 &amp; Charger #2 failure</li> <li>• Pressure transducer fault</li> </ul> </li> <li>• Common engine trouble <ul style="list-style-type: none"> <li>• High engine temperature</li> <li>• Fail to start</li> <li>• Fuel injection malfunction**</li> <li>• ECM selector switch in alternate position***</li> <li>• Battery #1 &amp; battery #2 failure</li> <li>• DC failure</li> <li>• Loss of continuity (starter) #1 and/or #2</li> <li>• PLD low suction pressure</li> <li>• Overspeed</li> <li>• Fail when running</li> <li>• Low oil pressure</li> </ul> </li> <li>• Common pump room trouble (field re-assignable)* <ul style="list-style-type: none"> <li>• Low fuel level</li> <li>• High fuel level</li> <li>• Fuel tank leak</li> <li>• Low pump room temperature</li> <li>• High pump room temperature</li> <li>• AC Failure</li> </ul> </li> <li>• H-O-A selector switch in OFF or HAND</li> <li>• Free (field programmable)*</li> </ul>                                        |  |  |

\*Except if option C13 is ordered. Tornatech reserves the right to use any of these four alarm points for special specific application requirements

\*\*Applicable to electronic engines only.

\*\*\* Applicable to electronic engines only. Alarms when ECM selector switch on the engine is in alternate mode.





|                                                             |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                  |                                                                                                                                                               |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Terminals for Field Connections for External Devices</b> | <ul style="list-style-type: none"><li>• Low fuel level</li><li>• Remote AUTOMATIC start</li><li>• Water reservoir low (re-assignable)</li><li>• Fuel tank leak (re-assignable)</li><li>• High fuel level (re-assignable)</li></ul> |                                                                                                                                                                                                                                  |                                                                                                                                                               |
| <b>ViZiTouch V2.1 Operator Interface</b>                    | <ul style="list-style-type: none"><li>• Embedded microcomputer with software PLC logic</li><li>• 7.0” color touch screen (HMI technology)</li><li>• Upgradable software</li><li>• Multi-language</li></ul>                         |                                                                                                                                                                                                                                  |                                                                                                                                                               |
| <b>Operation</b>                                            | <b>Selector Switch</b>                                                                                                                                                                                                             | <ul style="list-style-type: none"><li>• Hand-Off-Auto</li><li>• Behind lockable and breakable cover</li></ul>                                                                                                                    |                                                                                                                                                               |
|                                                             | <b>Automatic Start</b>                                                                                                                                                                                                             | <ul style="list-style-type: none"><li>• Start on pressure drop</li><li>• Remote start signal from automatic device</li></ul>                                                                                                     |                                                                                                                                                               |
|                                                             | <b>Manual Start</b>                                                                                                                                                                                                                | <ul style="list-style-type: none"><li>• Crank 1 and Crank 2 start pushbuttons</li><li>• Run test pushbutton</li></ul>                                                                                                            |                                                                                                                                                               |
|                                                             | <b>Crank Cycle</b>                                                                                                                                                                                                                 | <ul style="list-style-type: none"><li>• 6 consecutive cycle attempts<ul style="list-style-type: none"><li>• 3 X 15s crank from battery 1 or 2 alternatively</li><li>• 15s rest in between each crank attempt</li></ul></li></ul> |                                                                                                                                                               |
|                                                             | <b>Stopping</b>                                                                                                                                                                                                                    | <ul style="list-style-type: none"><li>• Manual with Stop pushbutton</li><li>• Automatic after expiration of minimum run timer ****</li></ul>                                                                                     |                                                                                                                                                               |
|                                                             | <b>Timers</b>                                                                                                                                                                                                                      | <b>Field Adjustable &amp; Visual Countdown</b>                                                                                                                                                                                   | <ul style="list-style-type: none"><li>• Minimum run timer ****(off delay)</li><li>• Sequential start timer (on delay)</li><li>• Periodic test timer</li></ul> |
|                                                             | <b>Actuation</b>                                                                                                                                                                                                                   | <b>Visual Indication</b>                                                                                                                                                                                                         | <ul style="list-style-type: none"><li>• Pressure</li><li>• Non-pressure</li></ul>                                                                             |
|                                                             | <b>Mode</b>                                                                                                                                                                                                                        |                                                                                                                                                                                                                                  | <ul style="list-style-type: none"><li>• Automatic</li><li>• Non-automatic</li></ul>                                                                           |
| <b>Communication Protocol Capability</b>                    | <ul style="list-style-type: none"><li>• Protocol: Modbus</li><li>• Connection type: Shielded female connector RJ45</li><li>• Frame Format: TCP/IP</li><li>• Addresses: See bulletin MOD-GPD</li></ul>                              |                                                                                                                                                                                                                                  |                                                                                                                                                               |

| <b>Alarm and shutdown schedule</b> |                  | Automatic Start | Manual or Remote Start | Run Test or Periodic Test |
|------------------------------------|------------------|-----------------|------------------------|---------------------------|
|                                    | High Coolant     | Alarm only      | Alarm only             | Shutdown                  |
|                                    | Low Oil Pressure | Alarm only      | Alarm only             | Shutdown                  |
|                                    | Overspeed        | Shutdown        | Shutdown               | Shutdown                  |

|                  | <b>Wall Mount</b>                           |                                     | <b>Floor Mount</b>                         |                                     |
|------------------|---------------------------------------------|-------------------------------------|--------------------------------------------|-------------------------------------|
| Starting Voltage | Approx. shipping dimensions in inches (mm)  | Approx. Shipping Weight in Lbs (kg) | Approx. shipping dimensions in inches (mm) | Approx. Shipping Weight in Lbs (kg) |
| 12V.DC           | 32" l x 29" w x 16" h<br>(813 x 737 x 407 ) | 85 (39)                             | 32" l x 29" w x 26" h<br>(813 x 737 x 661) | 115 (52)                            |
| 24V.DC           |                                             |                                     |                                            |                                     |

\*\*\*\* Automatic shutdown shall be approved by the AHJ.



|                          |     |                                                                                 |
|--------------------------|-----|---------------------------------------------------------------------------------|
| <input type="checkbox"/> | A1  | Periodic test alarm contact (DPDT)                                              |
| <input type="checkbox"/> | A2  | Overspeed alarm contact (DPDT)                                                  |
| <input type="checkbox"/> | A3  | Low oil pressure alarm contact (DPDT)                                           |
| <input type="checkbox"/> | A4  | High coolant temperature alarm contact (DPDT)                                   |
| <input type="checkbox"/> | A5  | Failure to start alarm contacts alarm contact (DPDT)                            |
| <input type="checkbox"/> | A6  | Battery 1 & 2 failure alarm contact (2 x DPDT)                                  |
| <input type="checkbox"/> | A7  | Charger 1 & 2 failure alarm contact (2 x DPDT)                                  |
| <input type="checkbox"/> | A8  | AC failure alarm contact (DPDT)                                                 |
| <input type="checkbox"/> | A9  | System overpressure alarm contact (For engines with PLD) (DPDT)                 |
| <input type="checkbox"/> | A11 | Extra controller trouble alarm contact (DPDT)                                   |
| <input type="checkbox"/> | A12 | Extra engine trouble alarm contact (DPDT)                                       |
| <input type="checkbox"/> | Ax  | Additional engine alarm contact (DPDT) (specify function)                       |
| <input type="checkbox"/> | B1  | Low fuel level alarm contact (DPDT)                                             |
| <input type="checkbox"/> | B2  | Water reservoir level low alarm contact (DPDT)                                  |
| <input type="checkbox"/> | B3  | Water reservoir empty alarm contact (DPDT)                                      |
| <input type="checkbox"/> | B4  | Low pump room temperature alarm contact (DPDT)                                  |
| <input type="checkbox"/> | B5  | High fuel level alarm contact (DPDT)                                            |
| <input type="checkbox"/> | B6  | Low system (discharge) pressure alarm contact (DPDT)                            |
| <input type="checkbox"/> | B7  | Low suction pressure alarm contact (DPDT)                                       |
| <input type="checkbox"/> | B8  | Pump on demand alarm contact (DPDT)                                             |
| <input type="checkbox"/> | B9  | Fuel tank leak alarm contact (DPDT)                                             |
| <input type="checkbox"/> | B10 | Main relief valve open alarm contact (DPDT)                                     |
| <input type="checkbox"/> | B11 | Flow meter loop valve open alarm contact (DPDT)                                 |
| <input type="checkbox"/> | B12 | Water reservoir level high alarm contact (DPDT)                                 |
| <input type="checkbox"/> | B13 | High pump room temperature alarm contact (DPDT)                                 |
| <input type="checkbox"/> | Bx  | Additional pump room alarm contact (DPDT) (specify function)                    |
| <input type="checkbox"/> | C5  | CE Mark with factory certificate                                                |
| <input type="checkbox"/> | C6  | Nickel – cadmium battery chargers (Battery data sheet required)                 |
| <input type="checkbox"/> | C7  | Engine block heater circuit - 3KW max (same voltage as battery charger primary) |

|                          |      |                                                                                                                            |
|--------------------------|------|----------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | C7A  | Engine block heater circuit - 6KW max (same voltage as battery charger primary) Confirm power rating of block heater       |
| <input type="checkbox"/> | C9   | Non pressure actuated controller w/o pressure transducer and run test solenoid valve                                       |
| <input type="checkbox"/> | C13  | Louver activation circuit (battery power specific)                                                                         |
| <input type="checkbox"/> | C14  | Delayed automatic start on AC power failure (factory set at 15 minutes)                                                    |
| <input type="checkbox"/> | C15  | Low zone pump control function                                                                                             |
| <input type="checkbox"/> | C16  | Middle zone pump control function                                                                                          |
| <input type="checkbox"/> | C17  | High zone pump control function                                                                                            |
| <input type="checkbox"/> | C19  | Lockout/interlock circuit from equipment installed inside the pump room                                                    |
| <input type="checkbox"/> | D4   | Pressure transducer and run test solenoid valve for fresh water rated for 0-500psi (for factory calibration purposes only) |
| <input type="checkbox"/> | D6   | Pressure transducer and run test solenoid valve for sea water rated for 0-500PSI                                           |
| <input type="checkbox"/> | D7A  | Low fuel level float switch supplied as separate item (1-1/4")                                                             |
| <input type="checkbox"/> | D7B  | Low fuel level float switch supplied as separate item (1-1/2")                                                             |
| <input type="checkbox"/> | D8A  | High fuel level float switch supplied as separate item (1-1/4")                                                            |
| <input type="checkbox"/> | D8B  | High fuel level float switch supplied as separate item (1-1/2")                                                            |
| <input type="checkbox"/> | D9A  | Anti-condensation heater & thermostat                                                                                      |
| <input type="checkbox"/> | D9B  | Anti-condensation heater & humidistat                                                                                      |
| <input type="checkbox"/> | D9C  | Anti-condensation heater & thermostat & humidistat                                                                         |
| <input type="checkbox"/> | D11  | Low suction pressure transducer for fresh water rated at 0-300PSI with visual indication and alarm contact                 |
| <input type="checkbox"/> | D11A | Low suction pressure transducer for sea water rated at 0-300PSI with visual indication and alarm contact                   |
| <input type="checkbox"/> | D12  | Tropicalization                                                                                                            |
| <input type="checkbox"/> | D25  | Mounting stand                                                                                                             |
| <input type="checkbox"/> | D25A | Mounting stand SST- 304 painted                                                                                            |
| <input type="checkbox"/> | D25B | Mounting stand SST- 304 brushed finish                                                                                     |
| <input type="checkbox"/> | D25C | Mounting stand SST- 316 painted                                                                                            |
| <input type="checkbox"/> | D25D | Mounting stand SST- 316 brushed finish                                                                                     |
| <input type="checkbox"/> | D26  | Combined low and high fuel level float switch (1-1/4")                                                                     |

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.



|                          |      |                                                                                    |
|--------------------------|------|------------------------------------------------------------------------------------|
| <input type="checkbox"/> | D26A | Combined low and high fuel level float switch (1-1/2")                             |
| <input type="checkbox"/> | D27  | Fuel level probe (2") Level indication                                             |
| <input type="checkbox"/> | D28A | Field programmable I/O board - 5 Input / 5 output                                  |
| <input type="checkbox"/> | D30  | Redundant pressure transducer for fresh water rated for 0-500PSI                   |
| <input type="checkbox"/> | D31  | Redundant pressure transducer for sea water rated for 0-500PSI                     |
| <input type="checkbox"/> | D32  | Modbus with RTU frame format and RS485 connection                                  |
| <input type="checkbox"/> | D35  | Seismic Certification compliant to CBC 2019, IBC 2018 rigid base/wall mounted only |
| <input type="checkbox"/> | D38  | Special Seismic Certification compliant to OSHPD rigid base/wall mounted only      |

|                          |     |                                        |
|--------------------------|-----|----------------------------------------|
| <input type="checkbox"/> | L01 | Other language and English (bilingual) |
| <input type="checkbox"/> | L02 | French                                 |
| <input type="checkbox"/> | L03 | Spanish                                |
| <input type="checkbox"/> | L04 | German                                 |
| <input type="checkbox"/> | L05 | Italian                                |
| <input type="checkbox"/> | L06 | Polish                                 |
| <input type="checkbox"/> | L07 | Romanian                               |
| <input type="checkbox"/> | L08 | Hungarian                              |
| <input type="checkbox"/> | L09 | Slovak                                 |
| <input type="checkbox"/> | L10 | Croatian                               |
| <input type="checkbox"/> | L11 | Czech                                  |
| <input type="checkbox"/> | L12 | Portuguese                             |
| <input type="checkbox"/> | L13 | Dutch                                  |
| <input type="checkbox"/> | L14 | Russian                                |
| <input type="checkbox"/> | L15 | Turkish                                |
| <input type="checkbox"/> | L16 | Swedish                                |
| <input type="checkbox"/> | L17 | Bulgarian                              |
| <input type="checkbox"/> | L18 | Thai                                   |
| <input type="checkbox"/> | L19 | Indonesian                             |
| <input type="checkbox"/> | L20 | Slovenian                              |
| <input type="checkbox"/> | L21 | Danish                                 |
| <input type="checkbox"/> | L22 | Greek                                  |
| <input type="checkbox"/> | L23 | Arabic                                 |
| <input type="checkbox"/> | L24 | Hebrew                                 |
| <input type="checkbox"/> | L25 | Chinese                                |

Additional Options:

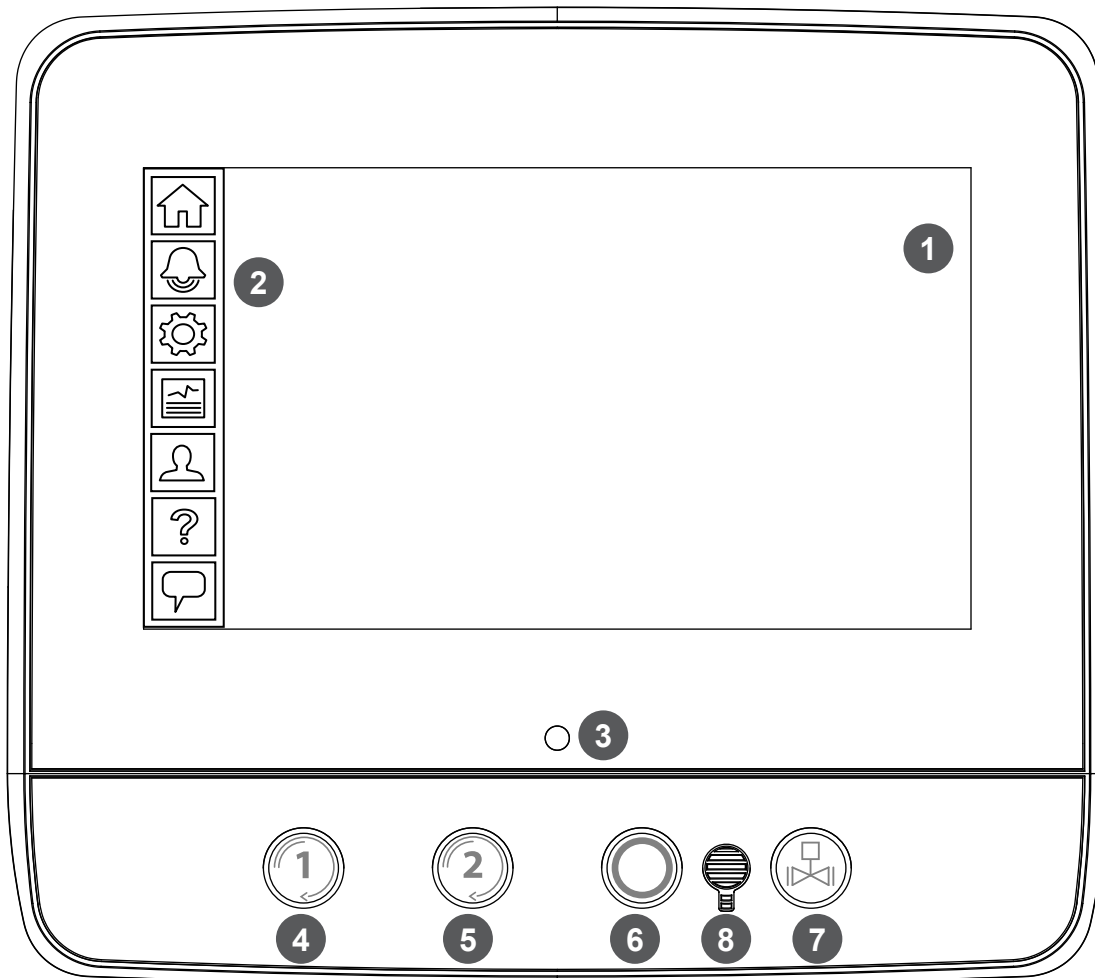
|                          |       |
|--------------------------|-------|
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.





#### ViZiTouch V2.1 Operator Interface



- |                        |                          |
|------------------------|--------------------------|
| 1 - Color touch screen | 3 - Power LED (3 colors) |
| 2 - Onscreen menu      | 4 - CRANK 1 button       |
| • HOME page            | 5 - CRANK 2 button       |
| • ALARM page           | 6 - STOP button          |
| • CONFIGURATION page   | 7 - RUN TEST button      |
| • HISTORY page         | 8 - Alarm buzzer         |
| • SERVICE page         |                          |
| • MANUAL page          |                          |
| • LANGUAGES page       |                          |

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BY DD/MM/YY

DRAWN BY ACD 28/02/23

FINAL APPROVAL FC 28/02/23

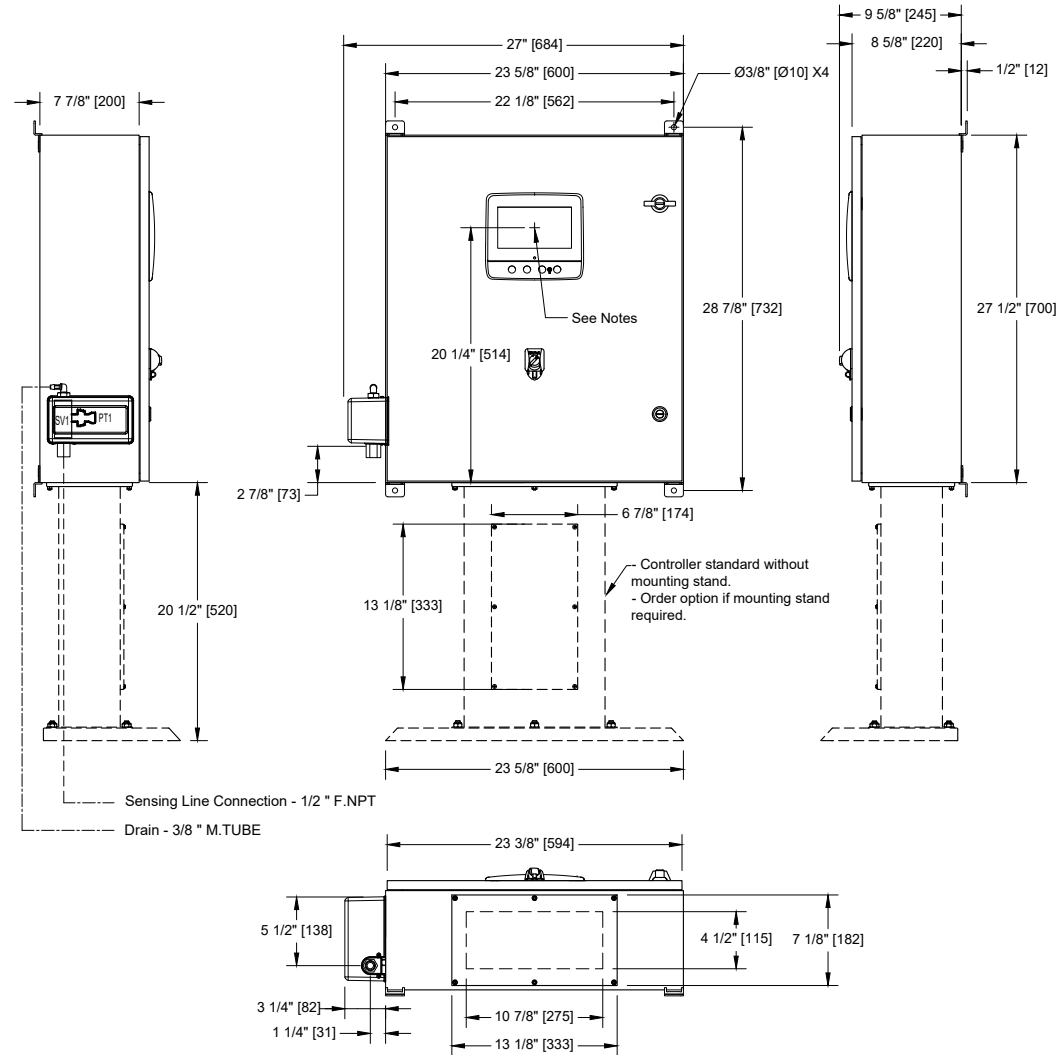
## DIESEL ENGINE FIRE PUMP CONTROLLER 12VDC OR 24VDC NEGATIVE GROUND

**MODEL: GPD**

BUILT TO THE LATEST EDITION OF THE NFPA20 &amp; NFPA70

THIRD ANGLE  
PROJECTION

DRAWING NUMBER  
**GPD-DI800/E**  
DWG REV. 0  
SHEET 1 OF 1

**Notes:**

- Standard: NEMA 2
- Standard paint : textured red RAL 3002.
- All dimensions are in inches [millimeters].
- Center of screen: 20-1/4" [514] from bottom (no feet).
- Bottom conduit entrance through removable gland plate recommended.
- Use watertight conduit and connector only.
- Protect equipment against drilling chips.
- Door swing equal to door width.



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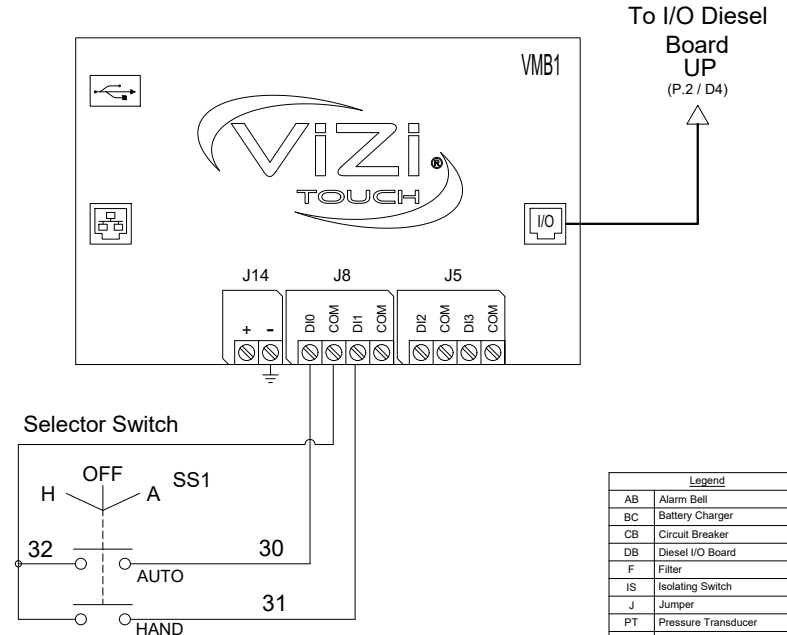
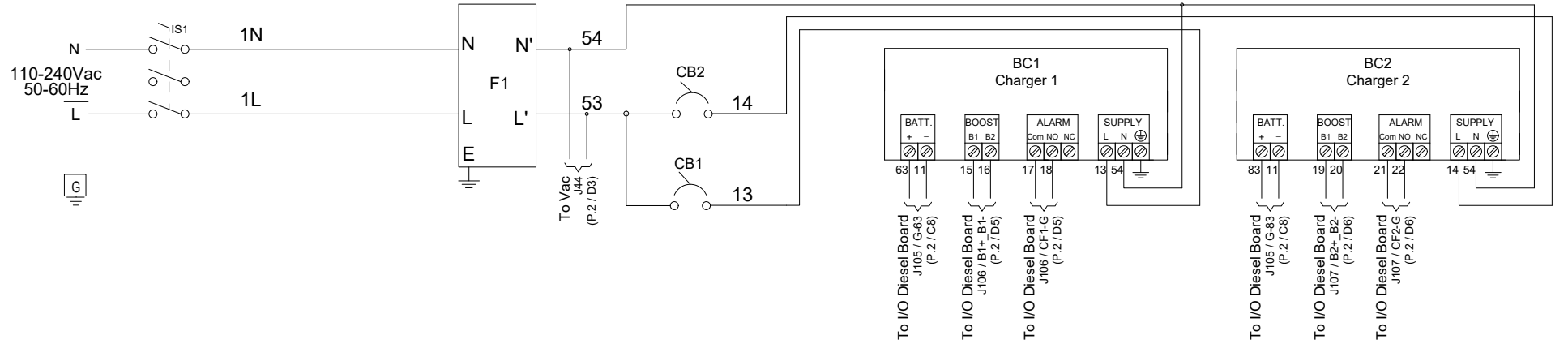
# DIESEL ENGINE FIRE PUMP CONTROLLER 12VDC OR 24VDC NEGATIVE GROUND

**MODEL:GPD**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70



DRAWING NUMBER  
**GPD-WS800/E**  
DWG REV. 0  
SHEET 1 OF 2



| Legend |                     |
|--------|---------------------|
| AB     | Alarm Bell          |
| BC     | Battery Charger     |
| CB     | Circuit Breaker     |
| DB     | Diesel I/O Board    |
| F      | Filter              |
| IS     | Isolating Switch    |
| J      | Jumper              |
| PT     | Pressure Transducer |
| SS     | Selector Switch     |
| SV     | Solenoid Valve      |
| VMB    | Main Board          |

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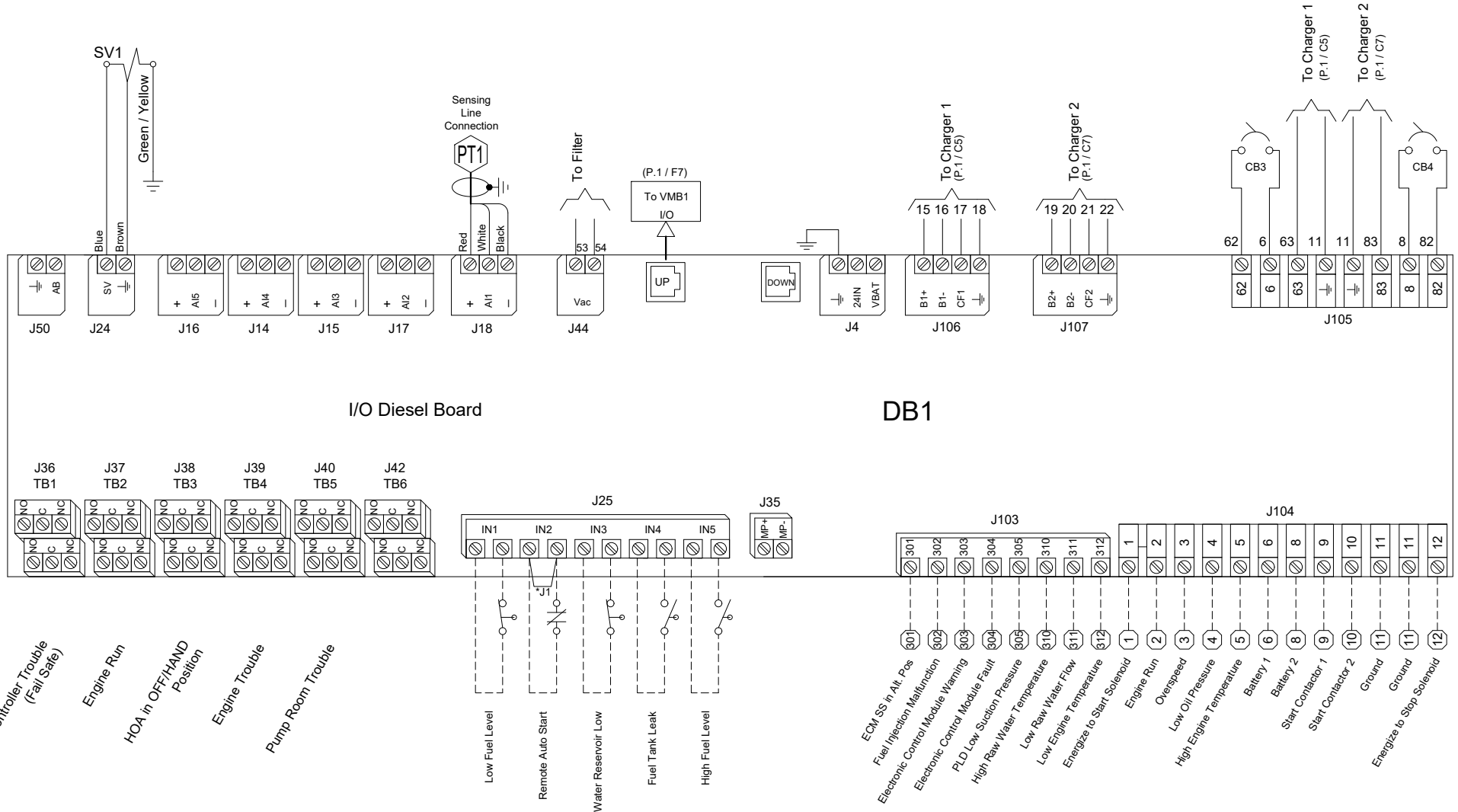
BY DD/MM/YY

DRAWN BY ACD 28/02/23

FINAL APPROVAL FC 28/02/23

**DIESEL ENGINE FIRE PUMP CONTROLLER  
12VDC OR 24VDC NEGATIVE GROUND****MODEL: GPD**

BUILT TO THE LATEST EDITION OF THE NFPA20 &amp; NFPA70

DRAWING NUMBER  
**GPD-WS800/E**  
DWG REV. 0  
SHEET 2 OF 2

\* Remove this jumper to use this feature





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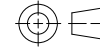
DRAWN BY ACD 28/02/23

FINAL APPROVAL FC 28/02/23

## DIESEL ENGINE FIRE PUMP CONTROLLER 12VDC OR 24VDC NEGATIVE GROUND

**MODEL:GPD**

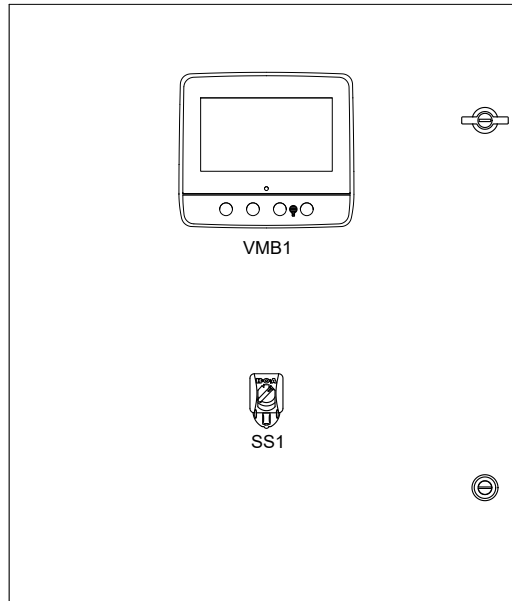
BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70



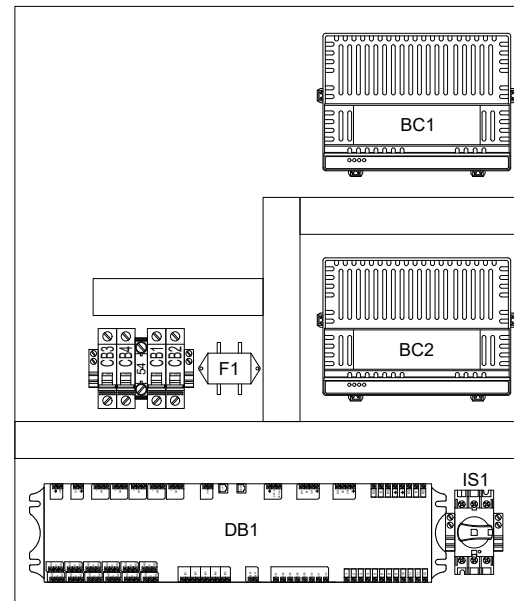
THIRD ANGLE  
PROJECTION

DRAWING NUMBER  
**GPD-LY800/E**  
DWG REV. 0  
SHEET 1 OF 1

| Designation | Description                         |
|-------------|-------------------------------------|
| BC1-BC2     | Battery Charger #1 and #2           |
| CB1-2       | Magnetic Breaker 1 Pole 10 A        |
| CB3-4       | Magnetic Breaker 1 Pole 16 A        |
| DB1         | I/O Diesel Board                    |
| F1          | Filter                              |
| IS1         | Isolating Switch                    |
| SS1         | Lockable 3 Position Selector Switch |
| VMB1        | Main Board                          |



Front Door Layout



Internal Layout



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| BY             |     | DD/MM/YY |
|----------------|-----|----------|
| DRAWN BY       | ACD | 28/02/23 |
| FINAL APPROVAL | FC  | 28/02/23 |

## DIESEL ENGINE FIRE PUMP CONTROLLER 12VDC OR 24VDC NEGATIVE GROUND

**MODEL:GPD**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

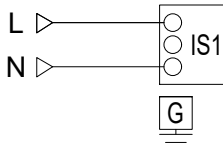


DRAWING NUMBER  
**GPD-TD800/E**  
DWG REV. 0  
SHEET 1 OF 1

### Power Supply

Terminals Wire Size:  
14 - 6 AWG  
1.8-2 Nm

110-240Vac  
50-60Hz



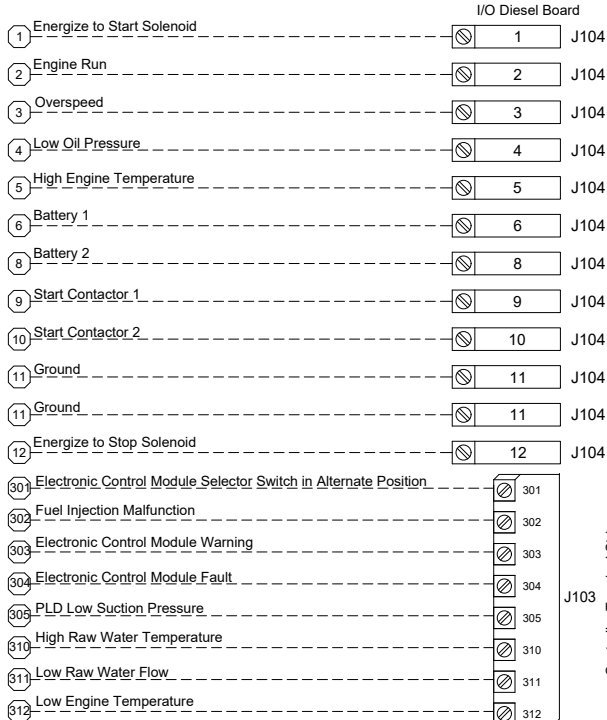
### Engine Connections

All wiring between the controller and diesel engine shall be stranded (NFPA20)  
Wiring between controller and engine (terminals 301, 302, 303, 304, 305, 310, 311, 312, 2, 3, 4, 5) must be #14AWG as minimum.

Wiring between controller and engine (terminals 12 [rated at 10A or 22A for 20 seconds] 1, 9, 10 [rated at 10A]) must be stranded #10AWG as minimum.

Wiring between controller and engine (terminals 6, 8, 11 [rated at 30A]) must be stranded and sized according to distance.

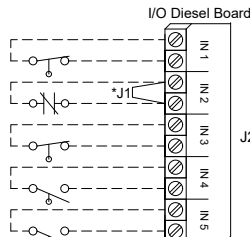
0-5' (0-1.5m) - 12 AWG (4 mm2)  
6-10' (1.8-3m) - 10 AWG (6 mm2)  
11-15' (3.3-4.5m) - 8 AWG (10 mm2)  
16-20' (4.8-6m) - 2x10 AWG (2x6 mm2)  
21-32' (6.4-9.75m) - 2x8 AWG (2x10 mm2)



### Field Connections

Terminals Wire Size:  
24 - 12 AWG  
0.5 Nm

Low Fuel Level  
Remote Auto Start  
Water Reservoir Low  
Fuel Tank Leak  
High Fuel Level



### Network Connections

Terminals Wire Size:  
Shielded Female Connector RJ45

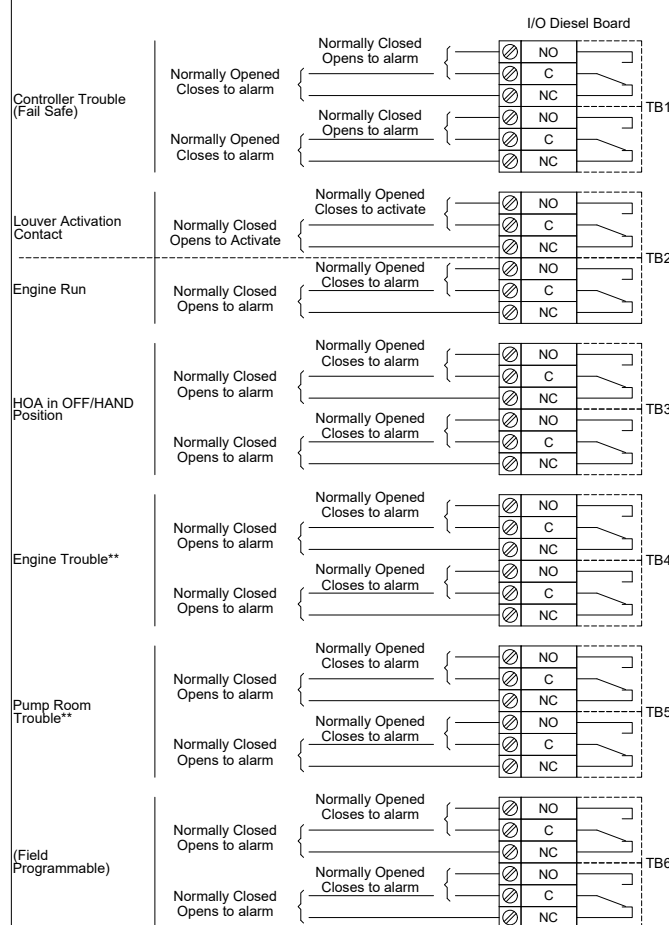
Modbus TCP/IP

Located on Main Board



### Alarm Contacts

Terminals Wire Size:  
24 - 12 AWG  
0.5 Nm



\* Remove this jumper to use this feature

\*\* Re-assignable



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## DIESEL ENGINE FIRE PUMP CONTROLLER 12VDC OR 24VDC NEGATIVE GROUND

**MODEL:GPD**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

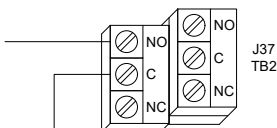


DRAWING NUMBER  
**GPD-TD801/E**  
DWG REV. 0  
SHEET 1 OF 1

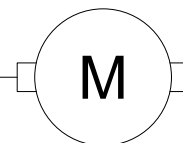
### Located in Controller

#### Engine Run Alarm Contacts

**C-NO**                      **C-NC**  
Normally open              Normally closed  
Closes to alarm              Opens to alarm



J37  
TB2



Louvers Motor

Power Supply from a Reliable  
External Power Source  
(See NFPA20-2016 11.3.2 & A 11.3.2)



Vendor Ref. No.

Contractor Ref. No

Project Name:

Contractor Job No.

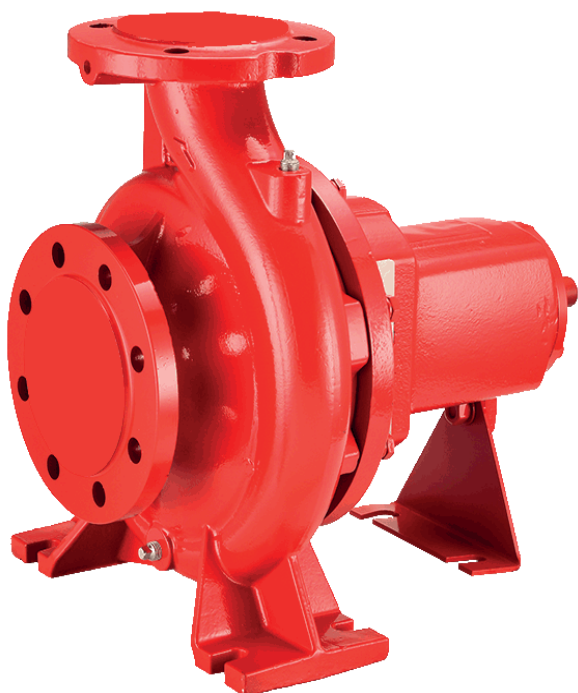
ELECTRIC MOTOR DRIVEN PUMP  
SPECIFICATIONS

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |



## END SUCTION FIRE PUMP

### END SUCTION FIRE PUMP



#### Technical Specifications

|                    |             |
|--------------------|-------------|
| Suction fange      | 1.5-6 Inch  |
| Discharge fange    | 2.5-4 inch  |
| Flow               | 50-1000 GPM |
| Discharge pressure | 84-230PSI   |

#### Material Specifications

|                          |                           |
|--------------------------|---------------------------|
| Casing                   | Ductile Iron              |
| Impeller                 | Bronze or stainless steel |
| Shaft                    | ATSM420                   |
| Sealing                  | Gland packing             |
| Bearing Housing          | Rolling bearing           |
| Suction/discharge fanges | ANSI                      |

#### Pump Naming

**VES 80-250**

Nominal impeller diameter (mm)

Discharge fange DN (mm)

Pump type

**VESD150-80-250**

Nominal impeller diameter (mm)

Discharge fange DN (mm)

Pump Type

#### Product Standard

UL 448, NFPA

#### Product Approvals



#### Flange Standards

Pump Installing Dimensions are confirming to ISO2858 Standard, and Tested according to with UL 448 -2013

#### Driver Options



Electrical



Diesel

#### Application Areas



Hydrant



Sprinkler



Overflow



Foam

#### Risk Class



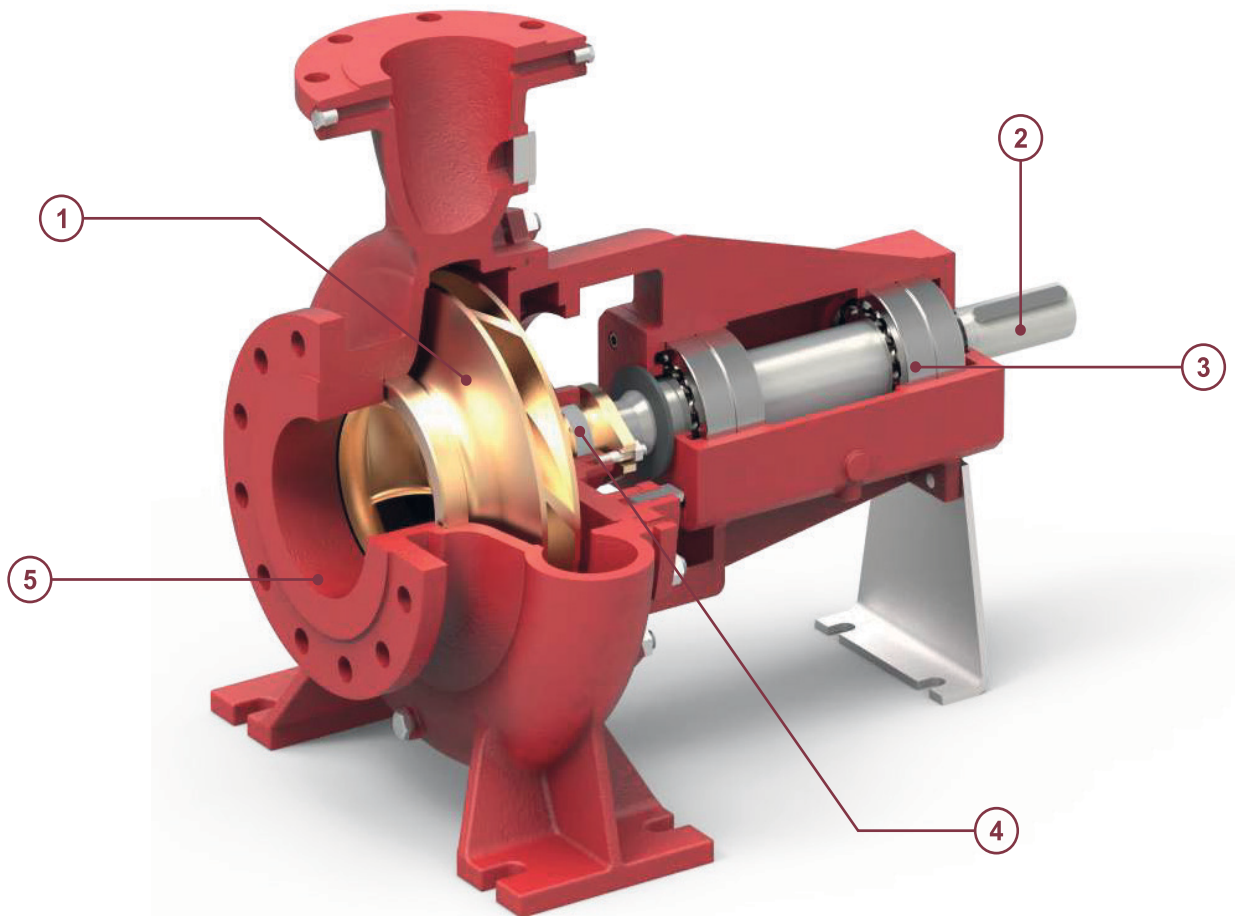
Ordinary



High

# END SUCTION FIRE PUMP

## General Pump Features



END SUCTION FIRE PUMP

### 1 - Impeller & Casing

- Impeller is dynamically balanced to grade G6.3 balance quality in accordance to ISO 1940-1.
- Impeller & Casing are designed using state of art CFD tools to ensure optimal performance.

### 2 - Shaft

- Heavy duty stainless steel shaft completely sealed and dry for zero corrosion available upon request.
- Short and rigid with negligible vibrations.
- Replaceable shaft protecting sleeves.
- No threads exposed to pump medium, long operating life and no corrosion.
- Adjustment-free assembly.

### 3 - Bearing

- Heavy duty and permanently grease lubricated antifriction bearings for long service life.
- Open gland, enough space for service activities.

### 4 - Seal

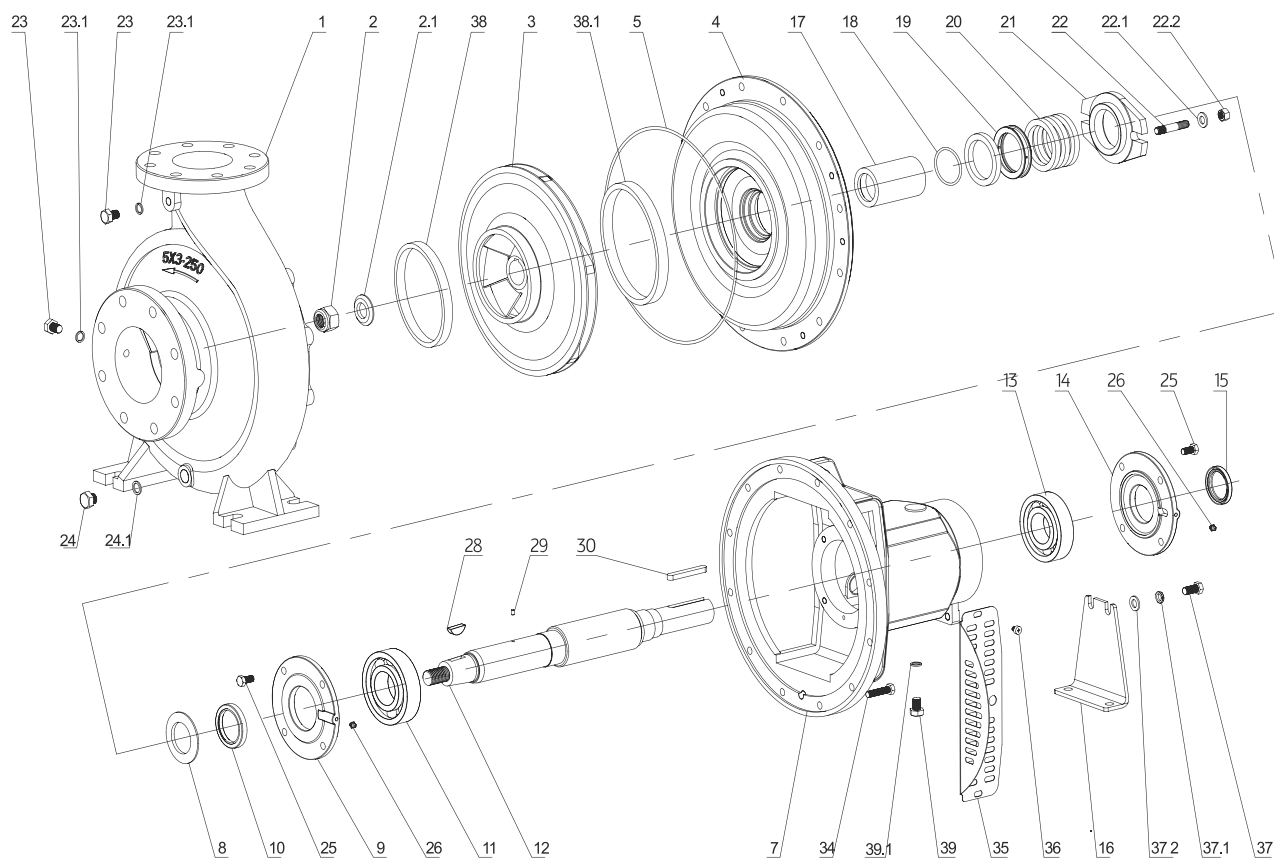
- Asbestos - free, soft packed stuffing boxes.

### 5 - Casing

- End Suction backpullout design permits maintenance of the pump without removing the pipes.
- Rugged Ball Bearings on Drive as well as Non Drive end.
- Flange drilled as per ANSI B16.1 class 250.
- Smooth surface inside & CED coated for superior corrosion protection.
- Replaceable wear ring protect the casing and the impeller running clearances.
- Heavy duty casing design for high working pressure.

# END SUCTION FIRE PUMP

## VES Series - Exploded View & Part list



END SUCTION FIRE PUMP

| Code | Part Name                |
|------|--------------------------|
| 1    | Casing                   |
| 2    | Impeller Nut             |
| 2.1  | Lock washer for impeller |
| 3    | Impeller                 |
| 4    | Gland Cover              |
| 5    | O-ring                   |
| 7    | Bearing Housing          |
| 8    | Rubber Slinger           |
| 9    | NDE Bearing Cover        |
| 10   | NDE Oil Seal             |
| 11   | NDE Bearing              |
| 12   | Shaft                    |
| 13   | DE Bearing               |
| 14   | DE Bearing Cover         |
| 15   | DE Oil Seal              |

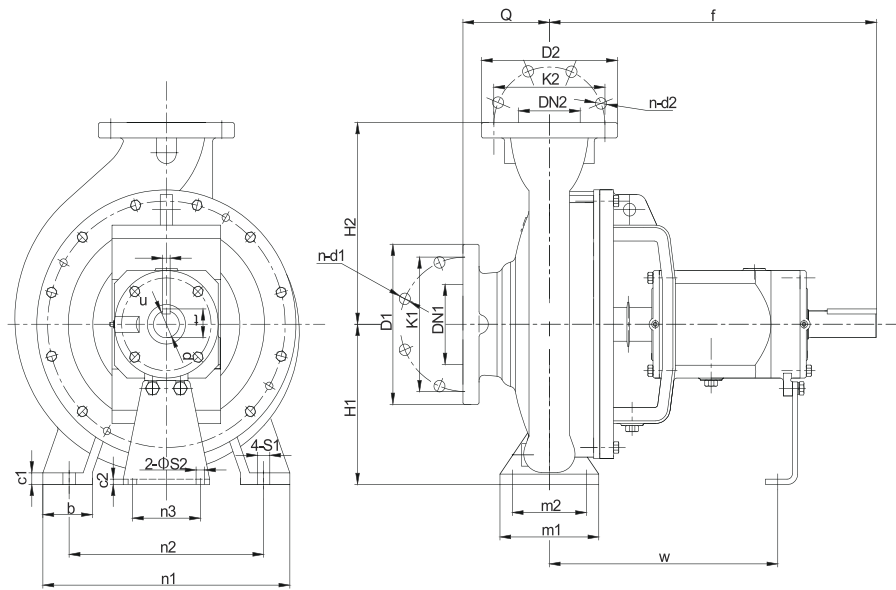
| Code | Part Name         |
|------|-------------------|
| 16   | Support Foot      |
| 17   | Packing Sleeve    |
| 18   | O-ring            |
| 19   | Gland Packing     |
| 20   | Packing Seal Cage |
| 21   | Gland Cover       |
| 22   | Stud Bolt         |
| 22.1 | Flat Washer       |
| 22.2 | Screw Nut         |
| 23   | Plug              |
| 23.1 | Plug Spacer       |
| 24   | Plug              |
| 24.1 | Plug Spacer       |
| 25   | Screw Bolt        |

| Code | Part Name        |
|------|------------------|
| 26   | Oil Cup M6       |
| 28   | key              |
| 29   | pin              |
| 30   | key              |
| 34   | Screw Bolt       |
| 35   | Protective cover |
| 36   | Bolt             |
| 37   | Screw Bolt       |
| 37.1 | Elastic Washer   |
| 37.2 | Flat Washer      |
| 38   | Front-Wearing    |
| 38.1 | Back-Wearing     |
| 39   | Plug             |
| 39.1 | Plug Spacer      |

# END SUCTION FIRE PUMP

## VES SERIES INSTALLATION DIMENSION

### END SUCTION FIRE PUMP



| Model       | DN1  |     | DN2  |     | Impeller Dia. | Shaft No. | a   | f   | h1  | h2  | b  | m1  | m2  | n1  | n2  | n3  | c1 | c2 | w   | S1  | S2  | d  | t  | u  | l   | Weight (kg) |
|-------------|------|-----|------|-----|---------------|-----------|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|----|----|-----|-----|-----|----|----|----|-----|-------------|
|             | inch | mm  | inch | mm  |               |           |     |     |     |     |    |     |     |     |     |     |    |    |     |     |     |    |    |    |     |             |
| 40-250      | 2.5" | 65  | 1.5" | 40  | 250           | 2         | 100 | 500 | 180 | 225 | 65 | 125 | 95  | 320 | 250 | 110 | 14 | 6  | 370 | M12 | M12 | 32 | 35 | 10 | 80  | 71          |
| 50-250      | 3"   | 80  | 2"   | 50  | 250           | 2         | 125 | 500 | 180 | 225 | 65 | 125 | 95  | 320 | 250 | 110 | 15 | 6  | 370 | M12 | M12 | 32 | 35 | 10 | 80  | 76          |
| 65-250      | 4"   | 100 | 2.5" | 65  | 250           | 2         | 125 | 500 | 200 | 250 | 80 | 160 | 120 | 360 | 280 | 110 | 16 | 6  | 370 | M16 | M12 | 32 | 35 | 10 | 80  | 84          |
| 80-250      | 5"   | 125 | 3"   | 80  | 250           | 2         | 125 | 500 | 225 | 280 | 80 | 160 | 120 | 400 | 315 | 110 | 18 | 6  | 370 | M16 | M12 | 32 | 35 | 10 | 80  | 88          |
| 80-315      | 5"   | 125 | 3"   | 80  | 315           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |
| 100-315     | 5"   | 125 | 4"   | 100 | 315           | 3         | 140 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 19 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 138         |
| 100-250     | 5"   | 125 | 4"   | 100 | 315           | 3         | 140 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 19 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 138         |
| 100-200     | 5"   | 125 | 4"   | 100 | 315           | 3         | 140 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 19 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 138         |
| 80-200      | 5"   | 125 | 3"   | 80  | 315           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |
| 150-100-200 | 6"   | 150 | 4"   | 100 | 200           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |
| 150-100-315 | 6"   | 150 | 4"   | 100 | 315           | 3         | 125 | 530 | 250 | 315 | 80 | 160 | 120 | 400 | 315 | 110 | 20 | 8  | 370 | M16 | M12 | 42 | 45 | 12 | 110 | 130         |

| Flange standard : ASTM B16.42-1998 Class150 |         |         |         |         |         | Flange standard : ASTM B16.42-1998 Class300 |         |         |         |
|---------------------------------------------|---------|---------|---------|---------|---------|---------------------------------------------|---------|---------|---------|
| DN1/DN2                                     | 1.5"    | 2"      | 2.5"    | 3"      | 4"      | 5"                                          | 3"      | 4"      | 5"      |
| D1/D2                                       | 127     | 152.4   | 177.8   | 190.5   | 228.6   | 254                                         | 209.6   | 254     | 279.4   |
| K1/K2                                       | 98.6    | 120.7   | 139.7   | 152.4   | 190.5   | 215.9                                       | 168.1   | 200.2   | 234.9   |
| n-d1/ n-d2                                  | 4-φ15.7 | 4-φ19.1 | 4-φ19.1 | 4-φ19.1 | 8-φ19.1 | 8-φ22.4                                     | 8-φ22.4 | 8-φ22.4 | 8-φ22.4 |



### FIRE PUMP SKIDS

MENA MECH IND CO is an established well reputed manufacturer of Premium Custom Engine Driven Centrifugal Fire Pump Skids. We specialized in designing and developing packages in compliance to NFPA 20 requirements with Listed & Approved Drivers.

MENA offers listed Centrifugal Fire Pump Skids that meet every fire protection need.

- Driven by Listed & Approved Diesel Engines or Electric Motors.
- Well aligned and Coupled for Direct Operation.
- Skid Packages are Pre-Tested and Inspected thoroughly before release to customers.
- One piece base plate with Anchor Bolt holes.
- Engineered, coated, hot rolled mild steel to resist corrosion and abrasion.
- Heavy Fabricated C-Channel Structure constructed to provide proper alignment of Pump with Diesel Engine or Pump with Motor.
- Compact skid Design with Small Foot-Print for Retrofit.
- High standard of Quality in material Construction finish and Workmanship.

## DIESEL DRIVEN SKIDS

MENA maintains its standard with using it's proudly own listed & approved Black Stallion Diesel Engines and Centrifugal Fire Pumps to package Heavy Duty and High Quality Compact Skids.

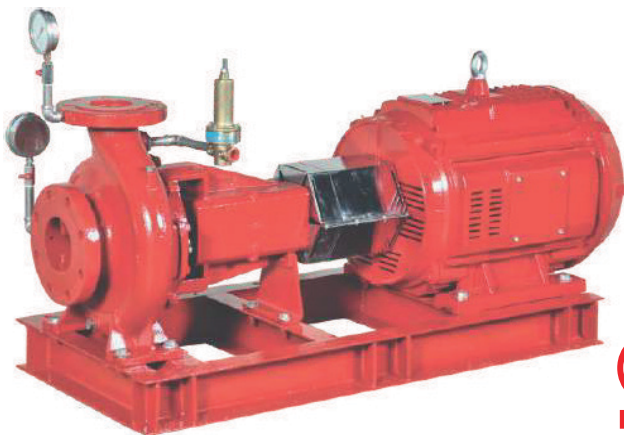
Our Listed and Approved Fire Pumps can also be coupled with any other Listed Diesel Engine of any specific brand as per customers requirement.



## MOTOR DRIVEN SKIDS

MENA maintains its standard with using WEG which is High Efficiency Fire Pump Motors with our own Listed and Approved Centrifugal Fire Pumps to package Heavy Duty and High Quality Compact Skids.

Our Listed and Approved Fire Pumps can also be coupled with any other Listed Fire Pump Motors of any specific brand as per client requirement.



## END SUCTION -RANGE

### APPROVED UL LISTING RANGE

| Rated Capacity, US GPM | Size, In. | Model            | Pressure Rating, psi | Approx Speed RPM | Maximum Working Pressure Psi |
|------------------------|-----------|------------------|----------------------|------------------|------------------------------|
| 50                     | 2.5×1.5   | VES 40-250       | 101 - 142            | 2900             | 200                          |
| 50                     | 2.5×1.5   | VES 40-250       | 144 - 207            | 3500             | 290                          |
| 100                    | 2.5×1.5   | VES 40-250       | 97 - 140             | 2900             | 200                          |
| 100                    | 2.5×1.5   | VES 40-250       | 140 - 203            | 3500             | 290                          |
| 150                    | 2.5×1.5   | VES 40-250       | 87 - 131             | 2900             | 200                          |
| 150                    | 2.5×1.5   | VES 40-250       | 133 - 196            | 3500             | 290                          |
| 150                    | 3×2       | VES 50-250       | 104 - 147            | 2980             | 225                          |
| 150                    | 3×2       | VES 50-250       | 144 - 202            | 3500             | 290                          |
| 200                    | 3×2       | VES 50-250       | 101 - 145            | 2980             | 225                          |
| 200                    | 3×2       | VES 50-250       | 140 - 200            | 3500             | 290                          |
| 250                    | 3×2       | VES 50-250       | 97 - 140             | 2980             | 225                          |
| 250                    | 3×2       | VES 50-250       | 136 - 196            | 3500             | 290                          |
| 250                    | 4×2.5     | VES 65-250       | 81 - 142             | 2980             | 225                          |
| 250                    | 4×2.5     | VES 65-250       | 131 - 207            | 3500             | 290                          |
| 300                    | 4×2.5     | VES 65-250       | 89 - 142             | 2900             | 225                          |
| 300                    | 4×2.5     | VES 65-250       | 130 - 206            | 3500             | 290                          |
| 400                    | 4×2.5     | VES 65-250       | 82 - 137             | 2900             | 225                          |
| 400                    | 4×2.5     | VES 65-250       | 125 - 203            | 3500             | 290                          |
| 400                    | 5×3       | VES 80-200       | 89 - 141             | 3500             | 225                          |
| 400                    | 5×3       | VES 80-250       | 88 - 140             | 2900             | 225                          |
| 400                    | 5×3       | VES 80-250       | 128 - 207            | 3500             | 290                          |
| 450                    | 5×3       | VES 80-200       | 86 - 139             | 3500             | 225                          |
| 450                    | 5×3       | VES 80-250       | 86 - 140             | 2900             | 225                          |
| 450                    | 5×3       | VES 80-250       | 127 - 206            | 3500             | 290                          |
| 450                    | 5×3       | VES 80-315       | 131 - 207            | 2900             | 290                          |
| 450                    | 5×4       | VES 100-200      | 88 - 143             | 3500             | 225                          |
| 450                    | 5×4       | VES 100-250      | 83 - 135             | 2900             | 290                          |
| 450                    | 5×4       | VES 100-250      | 123 - 198            | 3500             | 290                          |
| 450                    | 5×4       | VES 100-315      | 133 - 210            | 2900             | 290                          |
| 450                    | 5×4       | VES 100-315      | 140 - 222            | 2980             | 290                          |
| 500                    | 5×3       | VES 80-200       | 83 - 136             | 3500             | 225                          |
| 500                    | 5×3       | VES 80-250       | 84 - 139             | 2900             | 225                          |
| 500                    | 5×3       | VES 80-250       | 125 - 205            | 3500             | 290                          |
| 500                    | 5×3       | VES 80-315       | 127 - 204            | 2900             | 290                          |
| 500                    | 5×4       | VES 100-200      | 88 - 141             | 3500             | 225                          |
| 500                    | 5×4       | VES 100-250      | 83 - 134             | 2900             | 290                          |
| 500                    | 5×4       | VES 100-250      | 122 - 198            | 3500             | 290                          |
| 500                    | 5×4       | VES 100-315      | 132 - 209            | 2900             | 290                          |
| 500                    | 5×4       | VES 100-315      | 139 - 221            | 2980             | 290                          |
| 500                    | 6×4       | VESD 150-100-200 | 116 - 142            | 3500             | 225                          |
| 500                    | 6×4       | VESD 150-100-315 | 119 - 192            | 2900             | 250                          |
| 750                    | 5×4       | VES 100-200      | 82 - 138             | 3500             | 225                          |
| 750                    | 5×4       | VES 100-250      | 74 - 128             | 2900             | 290                          |
| 750                    | 5×4       | VES 100-250      | 115 - 191            | 3500             | 290                          |
| 750                    | 5×4       | VES 100-315      | 125 - 202            | 2900             | 290                          |
| 750                    | 5×4       | VES 100-315      | 133 - 214            | 2980             | 290                          |
| 750                    | 6×4       | VESD 150-100-200 | 112 - 137            | 3500             | 225                          |
| 750                    | 6×4       | VESD 150-100-315 | 113 - 186            | 2900             | 250                          |
| 1000                   | 6×4       | VESD 150-100-200 | 99 - 128             | 3500             | 225                          |
| 1000                   | 6×4       | VESD 150-100-315 | 101 - 173            | 2900             | 250                          |

LISTING RANGE





Vendor Ref. No.

Contractor Ref. No

Project Name:

Contractor Job No.

ELECTRIC PUMP  
ELECTRIC MOTOR SPECS

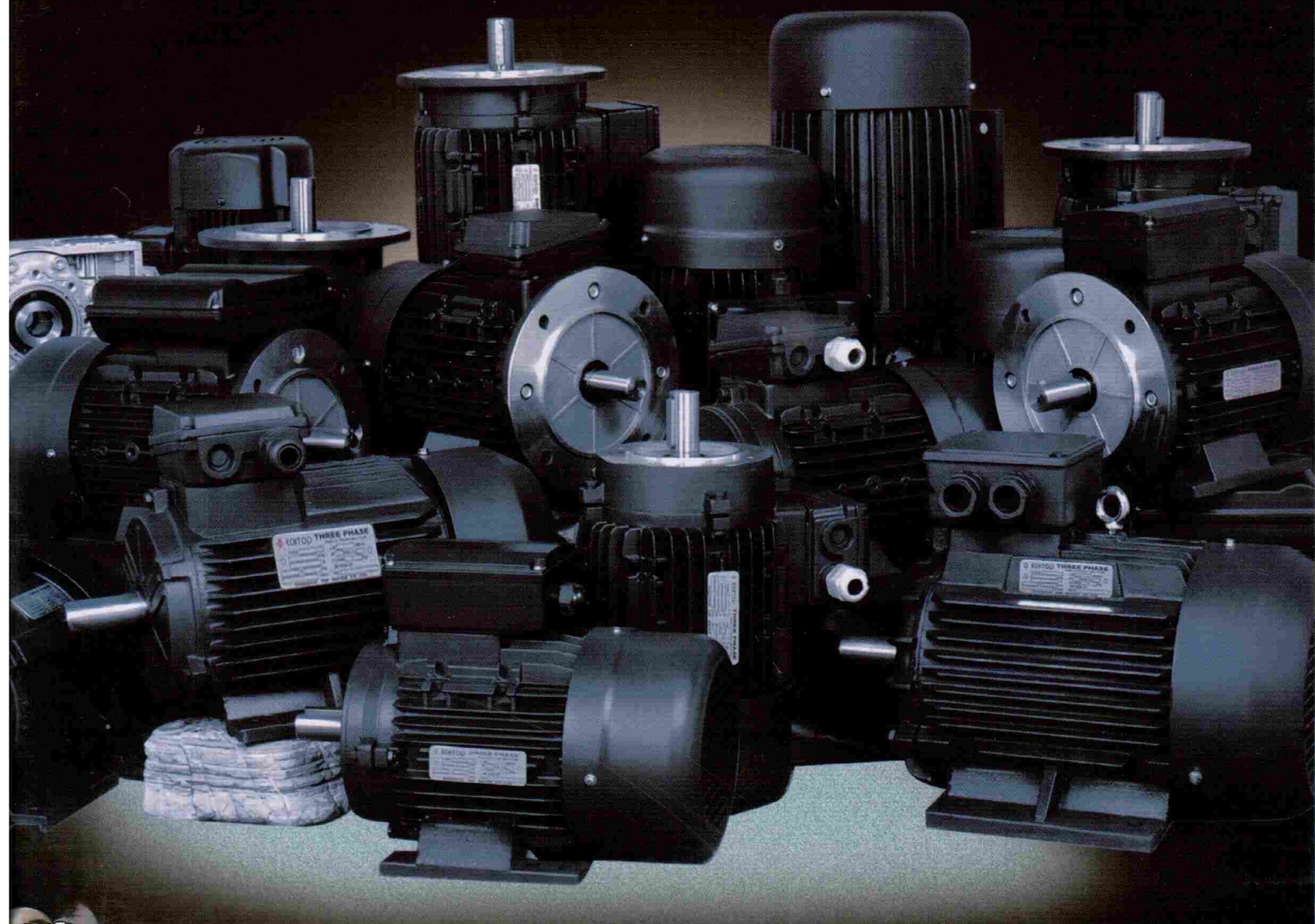
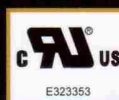
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|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

# ECHTOP<sup>®</sup> MOTOR

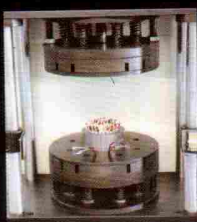
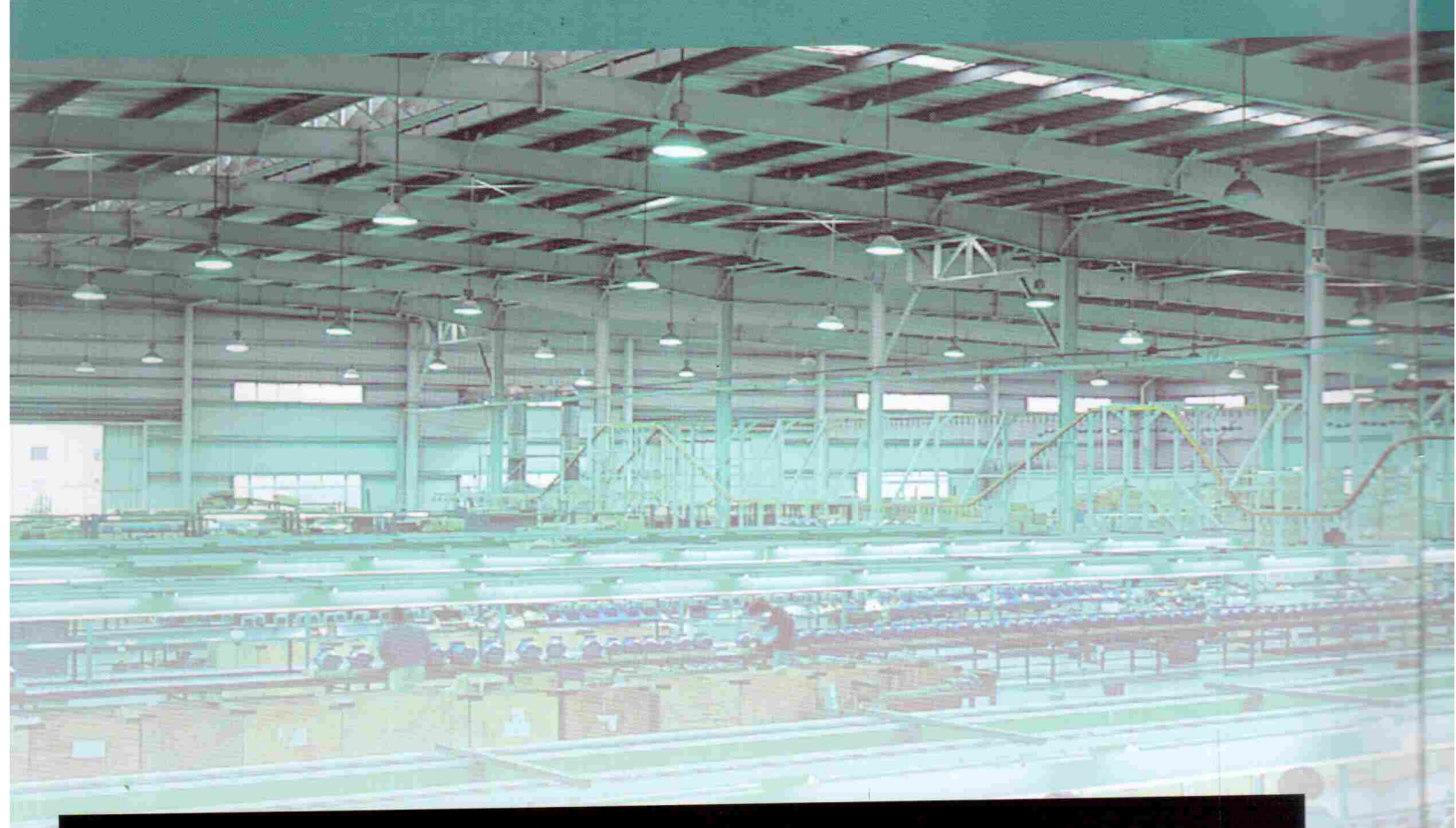
***New! Fire Pump Motor Ready***

SHANGHAI TOP MOTOR CO., LTD.

SHANGHAI HALOTOP IMPORT & EXPORT CO., LTD.  
GLOBAL POWER ENGINEERING CO. LTD.





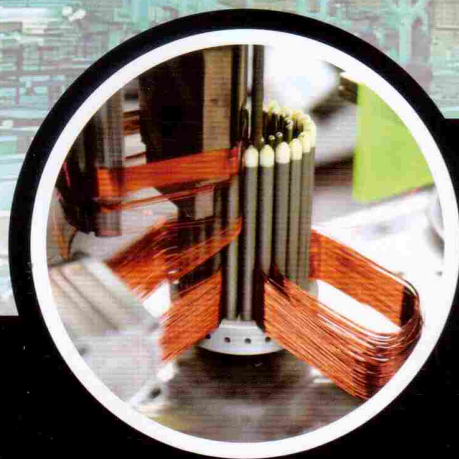


## **WORKSHOP & TECHNOLOGY**

TECHTOP adopts computerized machine tools for metal parts; four cylinder oil hydraulic presses for stator stacking; vacuum high-pressure varnishing units for stator varnishing; clean-dry and auto-phosphorescing machines for motor housing, end shield, fan cover and other parts; electrostatic spraying-water screen-suspending line complexes for product surface painting.



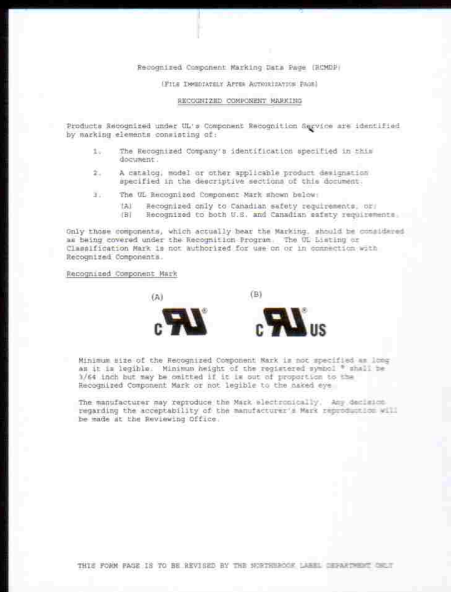
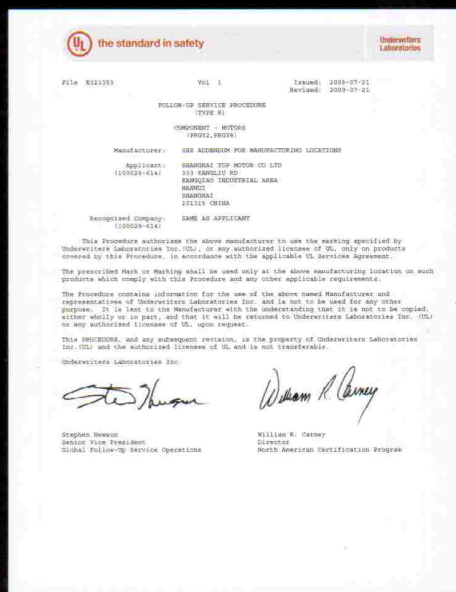




# Various Certificates



ISO9001



UL





# Various Certificates

## CERTIFICATE OF COMPLIANCE

Certificate Number 20150114-EX26635  
Report Reference EX26635-20141231  
Issue Date 2015-JANUARY-14

Issued to: SHANGHAI TOP MOTOR CO.LTD  
303 KANGLIU RD, KANGQIAO INDUSTRIAL AREA,  
NANHUI, SHANGHAI, 201315 CHINA

This is to certify that  
representative samples of FIRE PUMP MOTORS  
T Series, TXD Series, TDC Series, TXA Series, TXD  
Series: See Addendum Page below for Models

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 1004-1, Rotating Electrical Machines - General  
Requirements; UL 1004-5, Fire Pump Motors

Additional Information: See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's  
Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

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UL LLC

UL LLC

Any information and documentation bearing UL Mark are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please  
contact your local UL Customer Service Representative at 1-800-368-5868.

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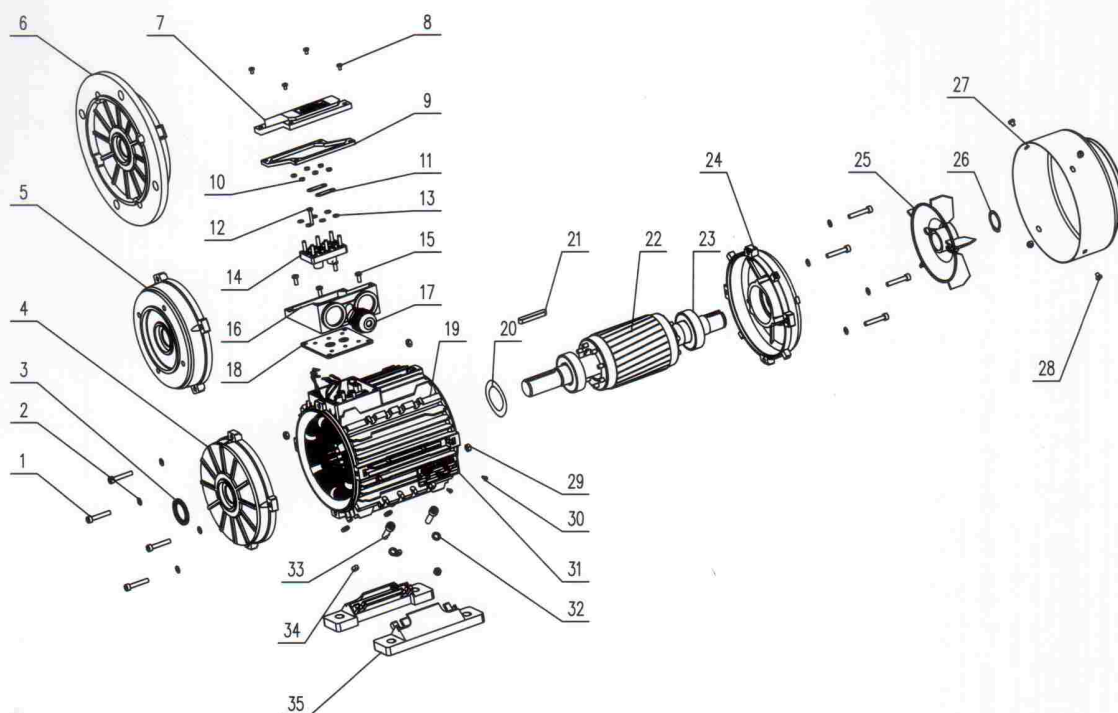


UL

[www.techtop.com](http://www.techtop.com)



# Motor Spare Part List "Exploded Drawing"



- |                              |                     |                            |
|------------------------------|---------------------|----------------------------|
| 1.screw                      | 13.Terminal shim    | 25.Cooling fan             |
| 2.Gasket                     | 14.Terminal board   | 26.Fan circlip             |
| 3.V-ring                     | 15.TB fixing screws | 27.Fan cover               |
| 4.Front endshield            | 16.TB base          | 28.Fan cover fixing screws |
| 5.B14 flange                 | 17.Cable gland      | 29.Endshield fixing nut    |
| 6.B5 flange                  | 18.TB bottomgasket  | 30.Rivet                   |
| 7.TB cover                   | 19.Frame            | 31.Rivet                   |
| 8.TB fixing screws           | 20.Preload washer   | 32.Foot fixing gasket      |
| 9.TB upper gasket            | 21.Key              | 33.Foot fixing screws      |
| 10.Terminal board fixing nut | 22.Rotor            | 34.Foot fixing nut         |
| 11.Terminal bridge           | 23.Bearing          | 35.Foot                    |
| 12.Terminal pin              | 24.NDE endshield    |                            |



## Serie Fire Pump Motors' Main Performance Parameters (IEC)

| Serial NO. | Model NO. | Volts    | Output (KW) | Output (HP) | Hz /DC | Locked current A(standard) 400V | Locked torque multiple (standard) | Maximum torque multiple (standard) | Minimum torque multiple (standard) | INS class | RPM  | The test environment temperature |
|------------|-----------|----------|-------------|-------------|--------|---------------------------------|-----------------------------------|------------------------------------|------------------------------------|-----------|------|----------------------------------|
| 1          | T 801-2   | 380-415V | 0.75        | 1.0         | 50     | 19.0                            | 175                               | 250                                | 120                                | F         | 2848 | 50°C                             |
| 2          | T 802-2   | 380-415V | 1.1         | 1.5         | 50     | 25.7                            | 175                               | 250                                | 120                                | F         | 2846 | 50°C                             |
| 3          | T 803-2   | 380-415V | 1.5         | 2.0         | 50     | 32.3                            | 170                               | 240                                | 120                                | F         | 2852 | 50°C                             |
| 4          | T 90S-2   | 380-415V | 1.5         | 2.0         | 50     | 32.3                            | 170                               | 240                                | 120                                | F         | 2852 | 50°C                             |
| 5          | T 90L1-2  | 380-415V | 2.2         | 3.0         | 50     | 40.9                            | 160                               | 230                                | 110                                | F         | 2845 | 50°C                             |
| 6          | T 90L2-2  | 380-415V | 3           | 4.0         | 50     | 49.4                            | 155                               | 220                                | 105                                | F         | 2851 | 50°C                             |
| 7          | T 100L-2  | 380-415V | 3           | 4.0         | 50     | 49.4                            | 155                               | 220                                | 105                                | F         | 2851 | 50°C                             |
| 8          | T 100L2-2 | 380-415V | 4           | 5.5         | 50     | 61.8                            | 145                               | 215                                | 105                                | F         | 2910 | 50°C                             |
| 9          | T 112M-2  | 380-415V | 4           | 5.5         | 50     | 61.8                            | 145                               | 215                                | 105                                | F         | 2910 | 50°C                             |
| 10         | T 112L-2  | 380-415V | 5.5         | 7.5         | 50     | 79.8                            | 140                               | 200                                | 100                                | F         | 2905 | 50°C                             |
| 11         | T 132S1-2 | 380-415V | 5.5         | 7.5         | 50     | 79.8                            | 140                               | 200                                | 100                                | F         | 2905 | 50°C                             |
| 12         | T 132S2-2 | 380-415V | 7.5         | 10.0        | 50     | 101.7                           | 135                               | 200                                | 100                                | F         | 2910 | 50°C                             |
| 13         | T 132M1-2 | 380-415V | 9.2         | 12.0        | 50     | 118.8                           | 130                               | 200                                | 100                                | F         | 2910 | 50°C                             |
| 14         | T 132M2-2 | 380-415V | 11          | 15.0        | 50     | 146.3                           | 130                               | 200                                | 100                                | F         | 2920 | 50°C                             |
| 15         | T 160M1-2 | 380-415V | 11          | 15.0        | 50     | 146.3                           | 130                               | 200                                | 100                                | F         | 2920 | 50°C                             |
| 16         | T 160M2-2 | 380-415V | 15          | 20.0        | 50     | 184.3                           | 130                               | 200                                | 100                                | F         | 2918 | 50°C                             |
| 17         | T 160L-2  | 380-415V | 18.5        | 25.0        | 50     | 230.9                           | 130                               | 200                                | 100                                | F         | 2922 | 50°C                             |
| 18         | T 180M-2  | 380-415V | 22          | 30.0        | 50     | 274.6                           | 130                               | 200                                | 100                                | F         | 2930 | 50°C                             |
| 19         | T 200L1-2 | 380-415V | 30          | 40.0        | 50     | 367.7                           | 125                               | 200                                | 100                                | F         | 2925 | 50°C                             |
| 20         | T 200L2-2 | 380-415V | 37          | 50.0        | 50     | 457.9                           | 120                               | 200                                | 100                                | F         | 2930 | 50°C                             |
| 21         | T 225M-2  | 380-415V | 45          | 60.0        | 50     | 549.1                           | 120                               | 200                                | 100                                | F         | 2930 | 50°C                             |
| 22         | T 250M-2  | 380-415V | 55          | 75.0        | 50     | 685.9                           | 105                               | 200                                | 95                                 | F         | 2940 | 50°C                             |
| 23         | T 280S-2  | 380-415V | 75          | 100.0       | 50     | 916.8                           | 105                               | 200                                | 95                                 | F         | 2940 | 50°C                             |
| 24         | T 280M-2  | 380-415V | 90          | 125.0       | 50     | 1146.7                          | 100                               | 200                                | 90                                 | F         | 2940 | 50°C                             |
| 25         | T 315S-2  | 380-415V | 110         | 150.0       | 50     | 1369.0                          | 100                               | 200                                | 90                                 | F         | 2940 | 50°C                             |
| 26         | T 315M-2  | 380-415V | 132         | 175.0       | 50     | 1599.8                          | 100                               | 200                                | 90                                 | F         | 2940 | 50°C                             |
| 27         | T 315L1-2 | 380-415V | 160         | 215.0       | 50     | 1900.0                          | 90                                | 175                                | 65                                 | F         | 2945 | 50°C                             |
| 28         | T 315L2-2 | 380-415V | 200         | 270.0       | 50     | 2636.3                          | 70                                | 175                                | 65                                 | F         | 2945 | 50°C                             |
| 29         | T 355M-2  | 380-415V | 250         | 330.0       | 50     | 3125.5                          | 70                                | 175                                | 65                                 | F         | 2945 | 50°C                             |
| 30         | T 355L-2  | 380-415V | 315         | 420.0       | 50     | 4075.5                          | 70                                | 175                                | 65                                 | F         | 2945 | 50°C                             |
| 31         | T 802-4   | 380-415V | 0.75        | 1.0         | 50     | 19.0                            | 275                               | 300                                | 190                                | F         | 1420 | 50°C                             |
| 32         | T 803-4   | 380-415V | 1.1         | 1.5         | 50     | 25.7                            | 250                               | 280                                | 175                                | F         | 1425 | 50°C                             |
| 33         | T 90S-4   | 380-415V | 1.1         | 1.5         | 50     | 25.7                            | 250                               | 280                                | 175                                | F         | 1425 | 50°C                             |
| 34         | T 90L-4   | 380-415V | 1.5         | 2.0         | 50     | 32.3                            | 235                               | 270                                | 165                                | F         | 1420 | 50°C                             |
| 35         | T 90L2-4  | 380-415V | 2.2         | 3.0         | 50     | 40.9                            | 215                               | 250                                | 150                                | F         | 1430 | 50°C                             |
| 36         | T 100L1-4 | 380-415V | 2.2         | 3.0         | 50     | 40.9                            | 215                               | 250                                | 150                                | F         | 1430 | 50°C                             |
| 37         | T 100L2-4 | 380-415V | 3           | 4.0         | 50     | 49.4                            | 200                               | 230                                | 140                                | F         | 1430 | 50°C                             |
| 38         | T 100L3-4 | 380-415V | 4           | 5.5         | 50     | 61.8                            | 180                               | 225                                | 130                                | F         | 1435 | 50°C                             |
| 39         | T 112M-4  | 380-415V | 4           | 5.5         | 50     | 61.8                            | 180                               | 225                                | 130                                | F         | 1435 | 50°C                             |
| 40         | T 112L-4  | 380-415V | 5.5         | 7.5         | 50     | 79.8                            | 175                               | 215                                | 120                                | F         | 1430 | 50°C                             |
| 41         | T 132S-4  | 380-415V | 5.5         | 7.5         | 50     | 79.8                            | 175                               | 215                                | 120                                | F         | 1430 | 50°C                             |
| 42         | T 132M-4  | 380-415V | 7.5         | 10.0        | 50     | 101.7                           | 165                               | 200                                | 115                                | F         | 1430 | 50°C                             |
| 43         | T 132L1-4 | 380-415V | 9.2         | 12.0        | 50     | 118.8                           | 160                               | 200                                | 115                                | F         | 1430 | 50°C                             |
| 44         | T 132L2-4 | 380-415V | 11          | 15.0        | 50     | 146.3                           | 160                               | 200                                | 110                                | F         | 1440 | 50°C                             |
| 45         | T 160M-4  | 380-415V | 11          | 15.0        | 50     | 146.3                           | 160                               | 200                                | 110                                | F         | 1440 | 50°C                             |
| 46         | T 160L-4  | 380-415V | 15          | 20.0        | 50     | 184.3                           | 150                               | 200                                | 105                                | F         | 1445 | 50°C                             |
| 47         | T 180M-4  | 380-415V | 18.5        | 25.0        | 50     | 230.9                           | 150                               | 200                                | 105                                | F         | 1445 | 50°C                             |
| 48         | T 180L-4  | 380-415V | 22          | 30.0        | 50     | 274.6                           | 150                               | 200                                | 105                                | F         | 1460 | 50°C                             |
| 49         | T 200L-4  | 380-415V | 30          | 40.0        | 50     | 367.7                           | 140                               | 200                                | 100                                | F         | 1460 | 50°C                             |
| 50         | T 225S-4  | 380-415V | 37          | 50.0        | 50     | 457.9                           | 140                               | 200                                | 100                                | F         | 1470 | 50°C                             |



## Serie Fire Pump Motors' Main Performance Parameters (IEC)

| Serial NO. | Model NO. | Volts    | Output (KW) | Output (HP) | Hz /DC | Locked current A(standard) 400V | Locked torque multiple (standard) | Maximum torque multiple (standard) | Minimum torque multiple (standard) | INS class | RPM  | The test environment temperature |
|------------|-----------|----------|-------------|-------------|--------|---------------------------------|-----------------------------------|------------------------------------|------------------------------------|-----------|------|----------------------------------|
| 51         | T 225M-4  | 380-415V | 45          | 60.0        | 50     | 549.1                           | 140                               | 200                                | 100                                | F         | 1480 | 50°C                             |
| 52         | T 250M-4  | 380-415V | 55          | 75.0        | 50     | 685.9                           | 140                               | 200                                | 100                                | F         | 1480 | 50°C                             |
| 53         | T 280S-4  | 380-415V | 75          | 100.0       | 50     | 916.8                           | 125                               | 200                                | 100                                | F         | 1480 | 50°C                             |
| 54         | T 280M-4  | 380-415V | 90          | 125.0       | 50     | 1146.7                          | 110                               | 200                                | 100                                | F         | 1480 | 50°C                             |
| 55         | T 315S-4  | 380-415V | 110         | 150.0       | 50     | 1369.0                          | 110                               | 200                                | 100                                | F         | 1480 | 50°C                             |
| 56         | T 315M-4  | 380-415V | 132         | 175.0       | 50     | 1599.8                          | 100                               | 200                                | 90                                 | F         | 1480 | 50°C                             |
| 57         | T 315L1-4 | 380-415V | 160         | 215.0       | 50     | 1900.0                          | 90                                | 175                                | 75                                 | F         | 1480 | 50°C                             |
| 58         | T 315L2-4 | 380-415V | 200         | 270.0       | 50     | 2636.3                          | 80                                | 175                                | 75                                 | F         | 1480 | 50°C                             |
| 59         | T 355M1-4 | 380-415V | 220         | 300.0       | 50     | 2874.7                          | 80                                | 175                                | 75                                 | F         | 1480 | 50°C                             |
| 60         | T 355M2-4 | 380-415V | 250         | 330.0       | 50     | 3125.5                          | 80                                | 175                                | 75                                 | F         | 1480 | 50°C                             |
| 61         | T 355L1-4 | 380-415V | 280         | 375.0       | 50     | 3604.3                          | 80                                | 175                                | 75                                 | F         | 1480 | 50°C                             |
| 62         | T 355L2-4 | 380-415V | 315         | 420.0       | 50     | 4075.5                          | 80                                | 175                                | 75                                 | F         | 1480 | 50°C                             |
| 63         | T 355L3-4 | 380-415V | 355         | 475.0       | 50     | 4563.8                          | 80                                | 175                                | 75                                 | F         | 1480 | 50°C                             |
| 64         | T 803-6   | 380-415V | 0.75        | 1.0         | 50     | 19.0                            | 170                               | 265                                | 120                                | F         | 935  | 50°C                             |
| 65         | T 90S-6   | 380-415V | 0.75        | 1.0         | 50     | 19.0                            | 170                               | 265                                | 120                                | F         | 935  | 50°C                             |
| 66         | T 90L-6   | 380-415V | 1.1         | 1.5         | 50     | 25.7                            | 165                               | 250                                | 115                                | F         | 935  | 50°C                             |
| 67         | T 100L-6  | 380-415V | 1.5         | 2.0         | 50     | 32.3                            | 160                               | 240                                | 110                                | F         | 940  | 50°C                             |
| 68         | T 112M-6  | 380-415V | 2.2         | 3.0         | 50     | 40.9                            | 155                               | 230                                | 110                                | F         | 940  | 50°C                             |
| 69         | T 112M1-6 | 380-415V | 3           | 4.0         | 50     | 49.4                            | 150                               | 220                                | 105                                | F         | 940  | 50°C                             |
| 70         | T 112M2-6 | 380-415V | 4           | 5.5         | 50     | 61.8                            | 150                               | 215                                | 105                                | F         | 940  | 50°C                             |
| 71         | T 132S-6  | 380-415V | 3           | 4.0         | 50     | 49.4                            | 150                               | 220                                | 105                                | F         | 940  | 50°C                             |
| 72         | T 132M1-6 | 380-415V | 4           | 5.5         | 50     | 61.8                            | 150                               | 215                                | 105                                | F         | 945  | 50°C                             |
| 73         | T 132M2-6 | 380-415V | 5.5         | 7.5         | 50     | 79.8                            | 150                               | 205                                | 105                                | F         | 945  | 50°C                             |
| 74         | T 132M3-6 | 380-415V | 7.5         | 10.0        | 50     | 101.7                           | 150                               | 200                                | 105                                | F         | 945  | 50°C                             |
| 75         | T 160M-6  | 380-415V | 7.5         | 10.0        | 50     | 101.7                           | 150                               | 200                                | 105                                | F         | 955  | 50°C                             |
| 76         | T 160L-6  | 380-415V | 11          | 15.0        | 50     | 146.3                           | 140                               | 200                                | 100                                | F         | 960  | 50°C                             |
| 77         | T 180L-6  | 380-415V | 15          | 20.0        | 50     | 184.3                           | 135                               | 200                                | 100                                | F         | 960  | 50°C                             |
| 78         | T 200L1-6 | 380-415V | 18.5        | 25.0        | 50     | 230.9                           | 135                               | 200                                | 100                                | F         | 965  | 50°C                             |
| 79         | T 200L2-6 | 380-415V | 22          | 30.0        | 50     | 274.6                           | 135                               | 200                                | 100                                | F         | 965  | 50°C                             |
| 80         | T 225M-6  | 380-415V | 30          | 40.0        | 50     | 367.7                           | 135                               | 200                                | 100                                | F         | 975  | 50°C                             |
| 81         | T 250M-6  | 380-415V | 37          | 50.0        | 50     | 457.9                           | 135                               | 200                                | 100                                | F         | 975  | 50°C                             |
| 82         | T 280S-6  | 380-415V | 45          | 60.0        | 50     | 549.1                           | 135                               | 200                                | 100                                | F         | 980  | 50°C                             |
| 83         | T 280M-6  | 380-415V | 55          | 75.0        | 50     | 685.9                           | 135                               | 200                                | 100                                | F         | 980  | 50°C                             |
| 84         | T 315S-6  | 380-415V | 75          | 100.0       | 50     | 916.8                           | 125                               | 200                                | 100                                | F         | 980  | 50°C                             |
| 85         | T 315M-6  | 380-415V | 90          | 125.0       | 50     | 1146.7                          | 125                               | 200                                | 100                                | F         | 980  | 50°C                             |
| 86         | T 315L1-6 | 380-415V | 110         | 150.0       | 50     | 1369.0                          | 120                               | 200                                | 100                                | F         | 980  | 50°C                             |
| 87         | T 315L2-6 | 380-415V | 132         | 175.0       | 50     | 1599.8                          | 120                               | 200                                | 100                                | F         | 980  | 50°C                             |
| 88         | T 355M1-6 | 380-415V | 160         | 215.0       | 50     | 1900.0                          | 100                               | 175                                | 90                                 | F         | 980  | 50°C                             |
| 89         | T 355M2-6 | 380-415V | 200         | 270.0       | 50     | 2636.3                          | 100                               | 175                                | 90                                 | F         | 980  | 50°C                             |
| 90         | T 355L1-6 | 380-415V | 220         | 300.0       | 50     | 2874.7                          | 100                               | 175                                | 90                                 | F         | 980  | 50°C                             |
| 91         | T 355L2-6 | 380-415V | 250         | 330.0       | 50     | 3125.5                          | 100                               | 175                                | 90                                 | F         | 980  | 50°C                             |





## DC Serie Fire Pump Motors' Main Performance Parameters(NEMA 415V 50HZ)

| Serial NO. | Model NO.      | Volts    | Output (HP) | Hz /DC | Locked current A(standard) 415V | Locked torque multiple (standard) | Maximum torque multiple (standard) | Minimum torque multiple (standard) | Service factor | INS class | RPM  | The test environment temperature |
|------------|----------------|----------|-------------|--------|---------------------------------|-----------------------------------|------------------------------------|------------------------------------|----------------|-----------|------|----------------------------------|
| 1          | TDC254T15U2B   | 380-415V | 15          | 50     | 141                             | 130                               | 200                                | 100                                | 1.15           | F         | 2920 | 50℃                              |
| 2          | TDC256T20U2B   | 380-415V | 20          | 50     | 177                             | 130                               | 200                                | 100                                | 1.15           | F         | 2920 | 50℃                              |
| 3          | TDC284TS25U2B  | 380-415V | 25          | 50     | 222                             | 130                               | 200                                | 100                                | 1.15           | F         | 2930 | 50℃                              |
| 4          | TDC286TS30U2B  | 380-415V | 30          | 50     | 264                             | 130                               | 200                                | 100                                | 1.15           | F         | 2930 | 50℃                              |
| 5          | TDC324TS40U2B  | 380-415V | 40          | 50     | 354                             | 125                               | 200                                | 100                                | 1.15           | F         | 2930 | 50℃                              |
| 6          | TDC326TS50U2B  | 380-415V | 50          | 50     | 441                             | 120                               | 200                                | 100                                | 1.15           | F         | 2930 | 50℃                              |
| 7          | TDC364TS60U2B  | 380-415V | 60          | 50     | 529                             | 120                               | 200                                | 100                                | 1.15           | F         | 2930 | 50℃                              |
| 8          | TDC365TS75U2B  | 380-415V | 75          | 50     | 661                             | 105                               | 200                                | 95                                 | 1.15           | F         | 2940 | 50℃                              |
| 9          | TDC405TS100U2B | 380-415V | 100         | 50     | 883                             | 105                               | 200                                | 95                                 | 1.15           | F         | 2940 | 50℃                              |
| 10         | TDC444TS125U2B | 380-415V | 125         | 50     | 1105                            | 100                               | 200                                | 90                                 | 1.15           | F         | 2940 | 50℃                              |
| 11         | TDC445TS150U2B | 380-415V | 150         | 50     | 1319                            | 100                               | 200                                | 90                                 | 1.15           | F         | 2940 | 50℃                              |
| 12         | TDC 254T15U4B  | 380-415V | 15          | 50     | 141                             | 160                               | 200                                | 110                                | 1.15           | F         | 1440 | 50℃                              |
| 13         | TDC 256T20U4B  | 380-415V | 20          | 50     | 177                             | 150                               | 200                                | 105                                | 1.15           | F         | 1445 | 50℃                              |
| 14         | TDC 284T25U4B  | 380-415V | 25          | 50     | 222                             | 150                               | 200                                | 105                                | 1.15           | F         | 1450 | 50℃                              |
| 15         | TDC 286T30U4B  | 380-415V | 30          | 50     | 264                             | 150                               | 200                                | 105                                | 1.15           | F         | 1460 | 50℃                              |
| 16         | TDC 324T40U4B  | 380-415V | 40          | 50     | 354                             | 140                               | 200                                | 100                                | 1.15           | F         | 1460 | 50℃                              |
| 17         | TDC 326T50U4B  | 380-415V | 50          | 50     | 441                             | 140                               | 200                                | 100                                | 1.15           | F         | 1470 | 50℃                              |
| 18         | TDC364T60U4B   | 380-415V | 60          | 50     | 529                             | 140                               | 200                                | 100                                | 1.15           | F         | 1480 | 50℃                              |
| 19         | TDC365T75U4B   | 380-415V | 75          | 50     | 661                             | 140                               | 200                                | 100                                | 1.15           | F         | 1480 | 50℃                              |
| 20         | TDC405T100U4B  | 380-415V | 100         | 50     | 883                             | 125                               | 200                                | 100                                | 1.15           | F         | 1480 | 50℃                              |
| 21         | TDC444T125U4B  | 380-415V | 125         | 50     | 1105                            | 110                               | 200                                | 100                                | 1.15           | F         | 1480 | 50℃                              |
| 22         | TDC445T150U4B  | 380-415V | 150         | 50     | 1319                            | 110                               | 200                                | 100                                | 1.15           | F         | 1480 | 50℃                              |
| 23         | TDC 254T7.5U6B | 380-415V | 7.5         | 50     | 77                              | 150                               | 200                                | 105                                | 1.15           | F         | 955  | 50℃                              |
| 24         | TDC 256T10U6B  | 380-415V | 10          | 50     | 98                              | 150                               | 200                                | 105                                | 1.15           | F         | 960  | 50℃                              |
| 25         | TDC 284T15U6B  | 380-415V | 15          | 50     | 141                             | 140                               | 200                                | 100                                | 1.15           | F         | 960  | 50℃                              |
| 26         | TDC 286T20U6B  | 380-415V | 20          | 50     | 177                             | 135                               | 200                                | 100                                | 1.15           | F         | 965  | 50℃                              |
| 27         | TDC 324T25U6B  | 380-415V | 25          | 50     | 222                             | 135                               | 200                                | 100                                | 1.15           | F         | 965  | 50℃                              |
| 28         | TDC 326T30U6B  | 380-415V | 30          | 50     | 264                             | 135                               | 200                                | 100                                | 1.15           | F         | 975  | 50℃                              |
| 29         | TDC364T40U6B   | 380-415V | 40          | 50     | 354                             | 135                               | 200                                | 100                                | 1.15           | F         | 975  | 50℃                              |
| 30         | TDC365T50U6B   | 380-415V | 50          | 50     | 441                             | 135                               | 200                                | 100                                | 1.15           | F         | 980  | 50℃                              |
| 31         | TDC404T60U6B   | 380-415V | 60          | 50     | 529                             | 135                               | 200                                | 100                                | 1.15           | F         | 980  | 50℃                              |
| 32         | TDC405T75U6B   | 380-415V | 75          | 50     | 661                             | 135                               | 200                                | 100                                | 1.15           | F         | 980  | 50℃                              |
| 33         | TDC444T100U6B  | 380-415V | 100         | 50     | 883                             | 125                               | 200                                | 100                                | 1.15           | F         | 980  | 50℃                              |
| 34         | TDC445T125U6B  | 380-415V | 125         | 50     | 1105                            | 125                               | 200                                | 100                                | 1.15           | F         | 980  | 50℃                              |





## DC Serie Fire Pump Motors' Main Performance Parameters(NEMA ODP 208~230/460V 60HZ)

| Serial NO. | Model NO.      | Volts        | Output (HP) | Hz /DC | Locked current A(standard) 460V | Locked torque multiple (standard) | Maximum torque multiple (standard) | Minimum torque multiple (standard) | Service factor | INS class | RPM  | The test environment temperature |
|------------|----------------|--------------|-------------|--------|---------------------------------|-----------------------------------|------------------------------------|------------------------------------|----------------|-----------|------|----------------------------------|
| 1          | TDC254T15U2B   | 208~230/460V | 15          | 60     | 116.0                           | 130                               | 200                                | 100                                | 1.15           | F         | 3504 | 50℃                              |
| 2          | TDC256T20U2B   | 208~230/460V | 20          | 60     | 145.0                           | 130                               | 200                                | 100                                | 1.15           | F         | 3504 | 50℃                              |
| 3          | TDC284TS25U2B  | 208~230/460V | 25          | 60     | 182.5                           | 130                               | 200                                | 100                                | 1.15           | F         | 3516 | 50℃                              |
| 4          | TDC286TS30U2B  | 208~230/460V | 30          | 60     | 217.5                           | 130                               | 200                                | 100                                | 1.15           | F         | 3516 | 50℃                              |
| 5          | TDC324TS40U2B  | 208~230/460V | 40          | 60     | 290.0                           | 125                               | 200                                | 100                                | 1.15           | F         | 3516 | 50℃                              |
| 6          | TDC326TS50U2B  | 208~230/460V | 50          | 60     | 362.5                           | 120                               | 200                                | 100                                | 1.15           | F         | 3516 | 50℃                              |
| 7          | TDC364TS60U2B  | 208~230/460V | 60          | 60     | 435.0                           | 120                               | 200                                | 100                                | 1.15           | F         | 3516 | 50℃                              |
| 8          | TDC365TS75U2B  | 208~230/460V | 75          | 60     | 542.5                           | 105                               | 200                                | 95                                 | 1.15           | F         | 3528 | 50℃                              |
| 9          | TDC405TS100U2B | 208~230/460V | 100         | 60     | 725.0                           | 105                               | 200                                | 95                                 | 1.15           | F         | 3528 | 50℃                              |
| 10         | TDC444TS125U2B | 460V         | 125         | 60     | 907.5                           | 100                               | 200                                | 90                                 | 1.15           | F         | 3528 | 50℃                              |
| 11         | TDC445TS150U2B | 460V         | 150         | 60     | 1085.0                          | 100                               | 200                                | 90                                 | 1.15           | F         | 3528 | 50℃                              |
| 12         | TDC 254T15U4B  | 208~230/460V | 15          | 60     | 116.0                           | 160                               | 200                                | 110                                | 1.15           | F         | 1728 | 50℃                              |
| 13         | TDC 256T20U4B  | 208~230/460V | 20          | 60     | 145.0                           | 150                               | 200                                | 105                                | 1.15           | F         | 1734 | 50℃                              |
| 14         | TDC 284T25U4B  | 208~230/460V | 25          | 60     | 182.5                           | 150                               | 200                                | 105                                | 1.15           | F         | 1740 | 50℃                              |
| 15         | TDC 286T30U4B  | 208~230/460V | 30          | 60     | 217.5                           | 150                               | 200                                | 105                                | 1.15           | F         | 1752 | 50℃                              |
| 16         | TDC 324T40U4B  | 208~230/460V | 40          | 60     | 290.0                           | 140                               | 200                                | 100                                | 1.15           | F         | 1752 | 50℃                              |
| 17         | TDC 326T50U4B  | 208~230/460V | 50          | 60     | 362.5                           | 140                               | 200                                | 100                                | 1.15           | F         | 1764 | 50℃                              |
| 18         | TDC364T60U4B   | 208~230/460V | 60          | 60     | 435.0                           | 140                               | 200                                | 100                                | 1.15           | F         | 1776 | 50℃                              |
| 19         | TDC365T75U4B   | 208~230/460V | 75          | 60     | 542.5                           | 140                               | 200                                | 100                                | 1.15           | F         | 1776 | 50℃                              |
| 20         | TDC405T100U4B  | 208~230/460V | 100         | 60     | 725.0                           | 125                               | 200                                | 100                                | 1.15           | F         | 1776 | 50℃                              |
| 21         | TDC444T125U4B  | 460V         | 125         | 60     | 907.5                           | 110                               | 200                                | 100                                | 1.15           | F         | 1776 | 50℃                              |
| 22         | TDC445T150U4B  | 460V         | 150         | 60     | 1085.0                          | 110                               | 200                                | 100                                | 1.15           | F         | 1776 | 50℃                              |
| 23         | TDC 254T7.5U6B | 208~230/460V | 7.5         | 60     | 63.5                            | 150                               | 200                                | 105                                | 1.15           | F         | 1146 | 50℃                              |
| 24         | TDC 256T10U6B  | 208~230/460V | 10          | 60     | 81.0                            | 150                               | 200                                | 105                                | 1.15           | F         | 1152 | 50℃                              |
| 25         | TDC 284T15U6B  | 208~230/460V | 15          | 60     | 116.0                           | 140                               | 200                                | 100                                | 1.15           | F         | 1152 | 50℃                              |
| 26         | TDC 286T20U6B  | 208~230/460V | 20          | 60     | 145.0                           | 135                               | 200                                | 100                                | 1.15           | F         | 1158 | 50℃                              |
| 27         | TDC 324T25U6B  | 208~230/460V | 25          | 60     | 182.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1158 | 50℃                              |
| 28         | TDC 326T30U6B  | 208~230/460V | 30          | 60     | 217.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1170 | 50℃                              |
| 29         | TDC364T40U6B   | 208~230/460V | 40          | 60     | 290.0                           | 135                               | 200                                | 100                                | 1.15           | F         | 1170 | 50℃                              |
| 30         | TDC365T50U6B   | 208~230/460V | 50          | 60     | 362.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1176 | 50℃                              |
| 31         | TDC404T60U6B   | 208~230/460V | 60          | 60     | 435.0                           | 135                               | 200                                | 100                                | 1.15           | F         | 1176 | 50℃                              |
| 32         | TDC405T75U6B   | 208~230/460V | 75          | 60     | 542.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1176 | 50℃                              |
| 33         | TDC444T100U6B  | 208~230/460V | 100         | 60     | 725.0                           | 125                               | 200                                | 100                                | 1.15           | F         | 1176 | 50℃                              |
| 34         | TDC445T125U6B  | 460V         | 125         | 60     | 907.5                           | 125                               | 200                                | 100                                | 1.15           | F         | 1176 | 50℃                              |



## XC Serie Fire Pump Motors' Main Performance Parameters (NEMA ODP 208~230/460V 60HZ)

| Serial NO. | Model NO.      | Volts        | Output (HP) | Hz /DC | Locked current A(standard) 460V | Locked torque multiple (standard) | Maximum torque multiple (standard) | Minimum torque multiple (standard) | Service factor | INS class | RPM  | The test environment temperature |
|------------|----------------|--------------|-------------|--------|---------------------------------|-----------------------------------|------------------------------------|------------------------------------|----------------|-----------|------|----------------------------------|
| 1          | TXC 143T1U2B   | 208~230/460V | 1           | 60     | 15                              | 175                               | 250                                | 120                                | 1.15           | F         | 3450 | 50°C                             |
| 2          | TXC 143T1.5U2B | 208~230/460V | 1.5         | 60     | 20                              | 175                               | 250                                | 120                                | 1.15           | F         | 3450 | 50°C                             |
| 3          | TXC 145T2U2B   | 208~230/460V | 2           | 60     | 25                              | 170                               | 240                                | 120                                | 1.15           | F         | 3450 | 50°C                             |
| 4          | TXC 182T3U2B   | 208~230/460V | 3           | 60     | 32                              | 160                               | 230                                | 110                                | 1.15           | F         | 3510 | 50°C                             |
| 5          | TXC 184T5U2B   | 208~230/460V | 5           | 60     | 46                              | 150                               | 215                                | 105                                | 1.15           | F         | 3510 | 50°C                             |
| 6          | TXC 213T7.5U2B | 208~230/460V | 7.5         | 60     | 63.5                            | 140                               | 200                                | 100                                | 1.15           | F         | 3520 | 50°C                             |
| 7          | TXC 215T10U2B  | 208~230/460V | 10          | 60     | 81                              | 135                               | 200                                | 100                                | 1.15           | F         | 3520 | 50°C                             |
| 8          | TXC 254T15U2B  | 208~230/460V | 15          | 60     | 116                             | 130                               | 200                                | 100                                | 1.15           | F         | 3540 | 50°C                             |
| 9          | TXC 256T20U2B  | 208~230/460V | 20          | 60     | 145                             | 130                               | 200                                | 100                                | 1.15           | F         | 3540 | 50°C                             |
| 10         | TXC 284TS25U2B | 208~230/460V | 25          | 60     | 182.5                           | 130                               | 200                                | 100                                | 1.15           | F         | 3550 | 50°C                             |
| 11         | TXC 286TS30U2B | 208~230/460V | 30          | 60     | 217.5                           | 130                               | 200                                | 100                                | 1.15           | F         | 3550 | 50°C                             |
| 12         | TXC 324TS40U2B | 208~230/460V | 40          | 60     | 290                             | 125                               | 200                                | 100                                | 1.15           | F         | 3560 | 50°C                             |
| 13         | TXC 326TS50U2B | 208~230/460V | 50          | 60     | 362.5                           | 120                               | 200                                | 100                                | 1.15           | F         | 3560 | 50°C                             |
| 14         | TXC364TS60U2B  | 208~230/460V | 60          | 60     | 435                             | 120                               | 200                                | 100                                | 1.15           | F         | 3560 | 50°C                             |
| 15         | TXC365TS75U2B  | 208~230/460V | 75          | 60     | 542.5                           | 105                               | 200                                | 95                                 | 1.15           | F         | 3560 | 50°C                             |
| 16         | TXC405TS100U2B | 208~230/460V | 100         | 60     | 725                             | 105                               | 200                                | 95                                 | 1.15           | F         | 3570 | 50°C                             |
| 17         | TXC444TS125U2B | 460          | 125         | 60     | 907.5                           | 100                               | 200                                | 90                                 | 1.15           | F         | 3575 | 50°C                             |
| 18         | TXC445TS150U2B | 460          | 150         | 60     | 1085                            | 100                               | 200                                | 90                                 | 1.15           | F         | 3575 | 50°C                             |
| 19         | TXC447TS200U2B | 460          | 200         | 60     | 1450                            | 100                               | 200                                | 90                                 | 1.15           | F         | 3575 | 50°C                             |
| 20         | TXC449TS250U2B | 460          | 250         | 60     | 1825                            | 70                                | 175                                | 65                                 | 1.15           | F         | 3575 | 50°C                             |
| 21         | TXC 143T1U4B   | 208~230/460V | 1           | 60     | 15                              | 275                               | 300                                | 190                                | 1.15           | F         | 1730 | 50°C                             |
| 22         | TXC 145T1.5U4B | 208~230/460V | 1.5         | 60     | 20                              | 250                               | 280                                | 175                                | 1.15           | F         | 1730 | 50°C                             |
| 23         | TXC 145T2U4B   | 208~230/460V | 2           | 60     | 25                              | 235                               | 270                                | 165                                | 1.15           | F         | 1730 | 50°C                             |
| 24         | TXC 182T3U4B   | 208~230/460V | 3           | 60     | 32                              | 215                               | 250                                | 150                                | 1.15           | F         | 1735 | 50°C                             |
| 25         | TXC 184T5U4B   | 208~230/460V | 5           | 60     | 46                              | 185                               | 225                                | 130                                | 1.15           | F         | 1735 | 50°C                             |
| 26         | TXC 213T7.5U4B | 208~230/460V | 7.5         | 60     | 63.5                            | 175                               | 215                                | 120                                | 1.15           | F         | 1740 | 50°C                             |
| 27         | TXC 215T10U4B  | 208~230/460V | 10          | 60     | 81                              | 165                               | 200                                | 115                                | 1.15           | F         | 1740 | 50°C                             |
| 28         | TXC 254T15U4B  | 208~230/460V | 15          | 60     | 116                             | 160                               | 200                                | 110                                | 1.15           | F         | 1750 | 50°C                             |
| 29         | TXC 256T20U4B  | 208~230/460V | 20          | 60     | 145                             | 150                               | 200                                | 105                                | 1.15           | F         | 1750 | 50°C                             |
| 30         | TXC 284T25U4B  | 208~230/460V | 25          | 60     | 182.5                           | 150                               | 200                                | 105                                | 1.15           | F         | 1760 | 50°C                             |
| 31         | TXC 286T30U4B  | 208~230/460V | 30          | 60     | 217.5                           | 150                               | 200                                | 105                                | 1.15           | F         | 1760 | 50°C                             |
| 32         | TXC 324T40U4B  | 208~230/460V | 40          | 60     | 290                             | 140                               | 200                                | 100                                | 1.15           | F         | 1770 | 50°C                             |
| 33         | TXC 326T50U4B  | 208~230/460V | 50          | 60     | 362.5                           | 140                               | 200                                | 100                                | 1.15           | F         | 1770 | 50°C                             |
| 34         | TXC364T60U4B   | 208~230/460V | 60          | 60     | 435                             | 140                               | 200                                | 100                                | 1.15           | F         | 1775 | 50°C                             |
| 35         | TXC365T75U4B   | 208~230/460V | 75          | 60     | 542.5                           | 140                               | 200                                | 100                                | 1.15           | F         | 1775 | 50°C                             |
| 36         | TXC405T100U4B  | 208~230/460V | 100         | 60     | 725                             | 125                               | 200                                | 100                                | 1.15           | F         | 1780 | 50°C                             |
| 37         | TXC444T125U4B  | 460          | 125         | 60     | 907.5                           | 110                               | 200                                | 100                                | 1.15           | F         | 1780 | 50°C                             |
| 38         | TXC445T150U4B  | 460          | 150         | 60     | 1085                            | 110                               | 200                                | 100                                | 1.15           | F         | 1780 | 50°C                             |
| 39         | TXC447T200U4B  | 460          | 200         | 60     | 1450                            | 100                               | 200                                | 90                                 | 1.15           | F         | 1780 | 50°C                             |
| 40         | TXC449T250U4B  | 460          | 250         | 60     | 1825                            | 80                                | 175                                | 75                                 | 1.15           | F         | 1780 | 50°C                             |
| 41         | TXC 145T1U6B   | 208~230/460V | 1           | 60     | 15                              | 170                               | 265                                | 120                                | 1.15           | F         | 1150 | 50°C                             |
| 42         | TXC 182T1.5U6B | 208~230/460V | 1.5         | 60     | 20                              | 165                               | 250                                | 115                                | 1.15           | F         | 1150 | 50°C                             |
| 43         | TXC 184T2U6B   | 208~230/460V | 2           | 60     | 25                              | 160                               | 240                                | 110                                | 1.15           | F         | 1150 | 50°C                             |
| 44         | TXC 213T3U6B   | 208~230/460V | 3           | 60     | 32                              | 155                               | 230                                | 110                                | 1.15           | F         | 1150 | 50°C                             |
| 45         | TXC 215T5U6B   | 208~230/460V | 5           | 60     | 46                              | 150                               | 215                                | 105                                | 1.15           | F         | 1160 | 50°C                             |
| 46         | TXC 254T7.5U6B | 208~230/460V | 7.5         | 60     | 63.5                            | 150                               | 200                                | 105                                | 1.15           | F         | 1160 | 50°C                             |
| 47         | TXC 256T10U6B  | 208~230/460V | 10          | 60     | 81                              | 150                               | 200                                | 105                                | 1.15           | F         | 1165 | 50°C                             |
| 48         | TXC 284T15U6B  | 208~230/460V | 15          | 60     | 116                             | 140                               | 200                                | 100                                | 1.15           | F         | 1165 | 50°C                             |
| 49         | TXC 286T20U6B  | 208~230/460V | 20          | 60     | 145                             | 135                               | 200                                | 100                                | 1.15           | F         | 1170 | 50°C                             |
| 50         | TXC 324T25U6B  | 208~230/460V | 25          | 60     | 182.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1170 | 50°C                             |
| 51         | TXC 326T30U6B  | 208~230/460V | 30          | 60     | 217.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1175 | 50°C                             |
| 52         | TXC364T40U6B   | 208~230/460V | 40          | 60     | 290                             | 135                               | 200                                | 100                                | 1.15           | F         | 1175 | 50°C                             |
| 53         | TXC365T50U6B   | 208~230/460V | 50          | 60     | 362.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1180 | 50°C                             |
| 54         | TXC404T60U6B   | 208~230/460V | 60          | 60     | 435                             | 135                               | 200                                | 100                                | 1.15           | F         | 1180 | 50°C                             |
| 55         | TXC405T75U6B   | 208~230/460V | 75          | 60     | 542.5                           | 135                               | 200                                | 100                                | 1.15           | F         | 1180 | 50°C                             |
| 56         | TXC444T100U6B  | 208~230/460V | 100         | 60     | 725                             | 125                               | 200                                | 100                                | 1.15           | F         | 1180 | 50°C                             |
| 57         | TXC445T125U6B  | 460          | 125         | 60     | 907.5                           | 125                               | 200                                | 100                                | 1.15           | F         | 1180 | 50°C                             |
| 58         | TXC447T150U6B  | 460          | 150         | 60     | 1085                            | 120                               | 200                                | 100                                | 1.15           | F         | 1180 | 50°C                             |
| 59         | TXC449T200U6B  | 460          | 200         | 60     | 1450                            | 120                               | 200                                | 100                                | 1.15           | F         | 1180 | 50°C                             |



## TECHNICAL DATA

### PRODUCT FEATURES

|                      |                         |                           |                      |
|----------------------|-------------------------|---------------------------|----------------------|
| Model                | <b>F-TDC405TS100U2B</b> |                           |                      |
| Standard             | <b>NEMA MG-1</b>        | Output rating             | <b>100 HP</b>        |
| Frequency            | <b>60 Hz</b>            | Mounting                  | <b>Foot-mounted</b>  |
| Voltage              | <b>380-400 V</b>        | Flange                    | <b>Without</b>       |
| Number of poles      | <b>2</b>                | Mounting                  | <b>F-1</b>           |
| Degree of Protection | <b>IP23</b>             | Terminal box <sup>1</sup> | <b>Left position</b> |
| Synchronous speed    | <b>3600 rpm</b>         | Enclosure                 | <b>IC01 - ODP</b>    |

### PRODUCT DETAILS

|                         |                               |                     |                      |
|-------------------------|-------------------------------|---------------------|----------------------|
| Frame                   | <b>405TS</b>                  | Frequency           | <b>60 Hz</b>         |
| Output                  | <b>100 HP (75 kW)</b>         | Number of Poles     | <b>2</b>             |
| Slip                    | <b>0.0153</b>                 | Rated speed         | <b>3545 rpm</b>      |
| Rated voltage           | <b>380-400 V</b>              | Temperature rise    | <b>80 K</b>          |
| Rated current           | <b>135.4-128.6 A</b>          | Duty Cycle          | <b>Cont.(S1)</b>     |
| L. R. Amperes           | <b>884-839 A</b>              | Starting Method     | <b>Wye-Delta</b>     |
| LRC                     | <b>6.5x(Code G)</b>           | Ambient temperature | <b>50°C</b>          |
| No load current         | <b>28.5-26.5 A</b>            | Altitude            | <b>1000 m.a.s.l.</b> |
| Rated torque            | <b>148.21 ft.lb</b>           | Noise level         | <b>94.0 dB(A)</b>    |
| Locked rotor torque     | <b>105%</b>                   | Approx. weight      | <b>820 lb</b>        |
| Breakdown torque        | <b>200%</b>                   | Service factor      | <b>1.15</b>          |
| Locked rotor time       | <b>30s (cold) 16s (hot)</b>   | Design              | <b>B</b>             |
| Moment of inertia       | <b>6.93 ft.lb<sup>2</sup></b> | Insulation Class    | <b>F</b>             |
| Efficiency/Power factor | Load                          | Efficiency          | Power factor         |
|                         | 100%                          | <b>93</b>           | <b>0.9</b>           |
|                         | 75%                           | <b>93.6</b>         | <b>0.86</b>          |
|                         | 50%                           | <b>92.4</b>         | <b>0.8</b>           |
| Bearing                 | Drive-end                     | <b>6314C3</b>       |                      |
|                         | Opposite drive-end            | <b>6314C3</b>       |                      |



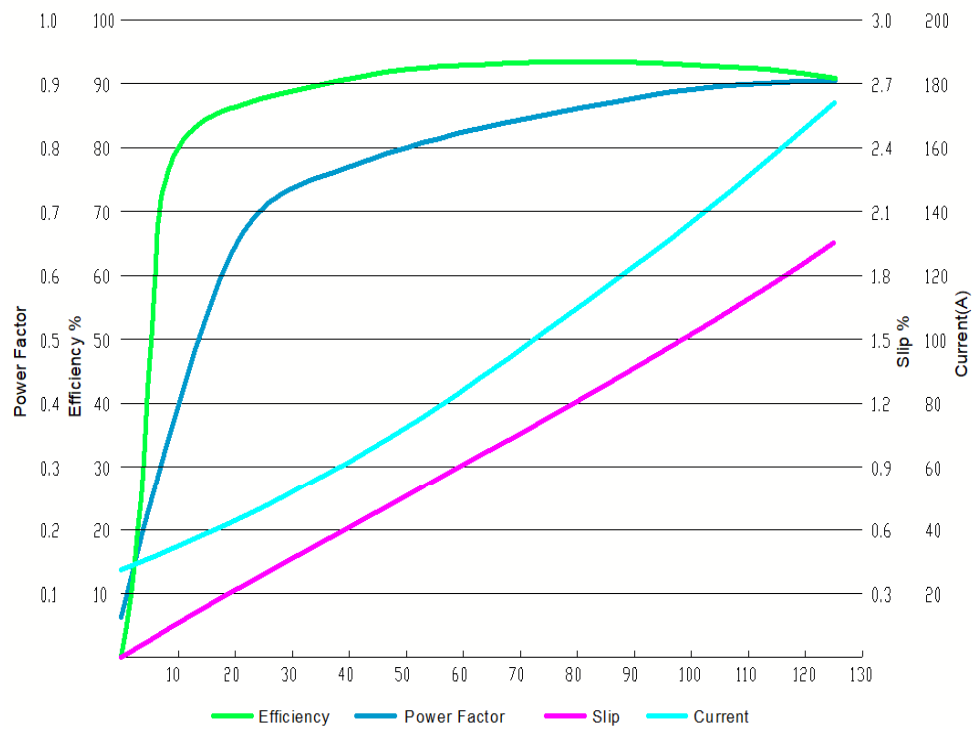
LISTED  
FIRE PUMP MOTOR  
EX26635



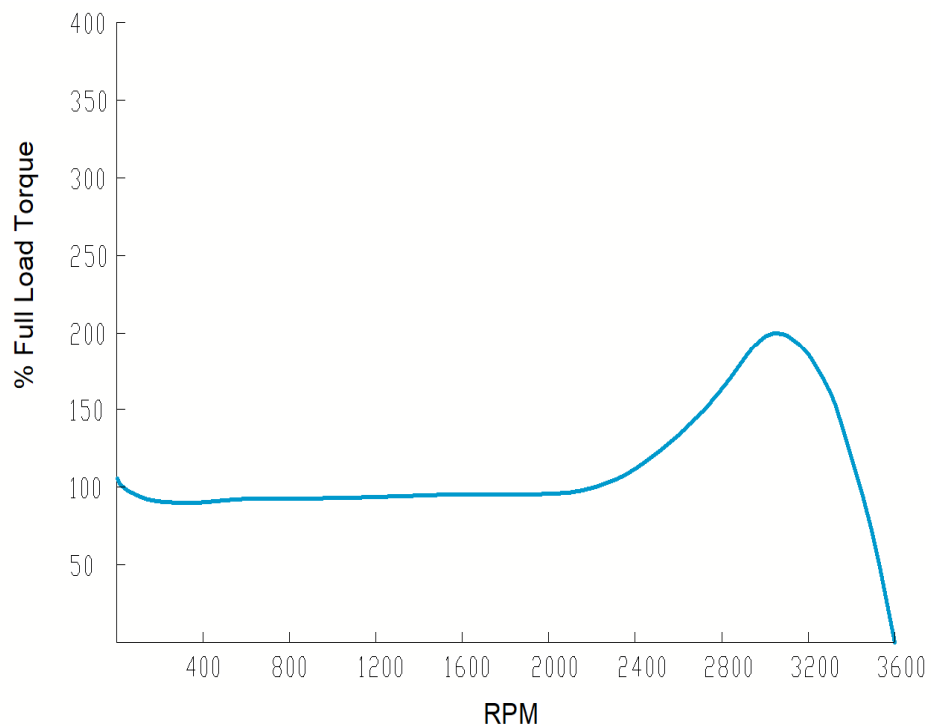
## PERFORMANCE CURVES

| Torque Values       | Torque (lb-ft) | Torque Values    | Torque (lb-ft) |
|---------------------|----------------|------------------|----------------|
| Locked Rotor Torque | <b>155.62</b>  | Breakdown Torque | <b>296.42</b>  |
| Pull-Up Torque      | <b>140.80</b>  | Full Load Torque | <b>148.21</b>  |

**Load Performance Curve**



**Torque Speed(T-n)Curve**

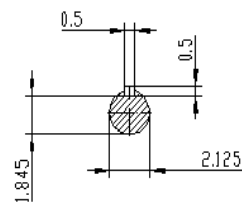
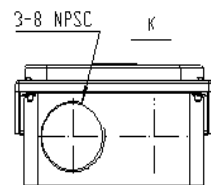
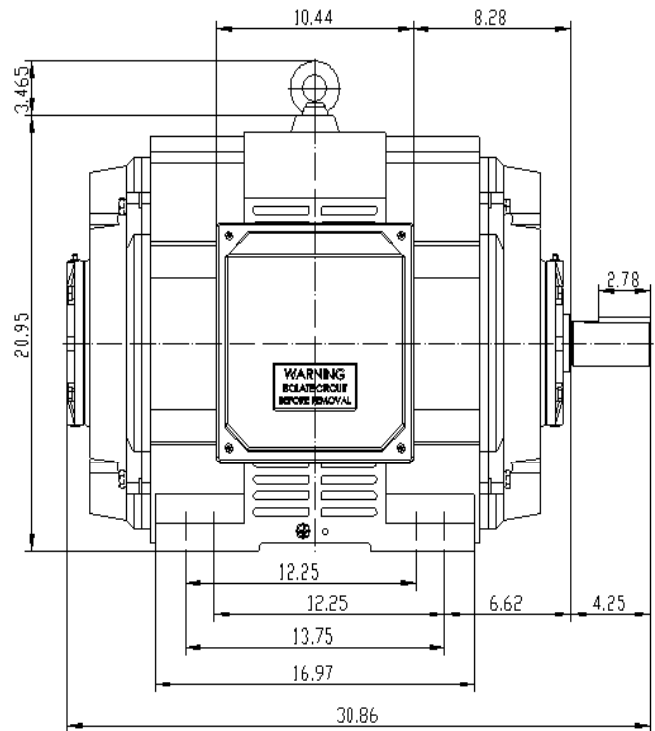
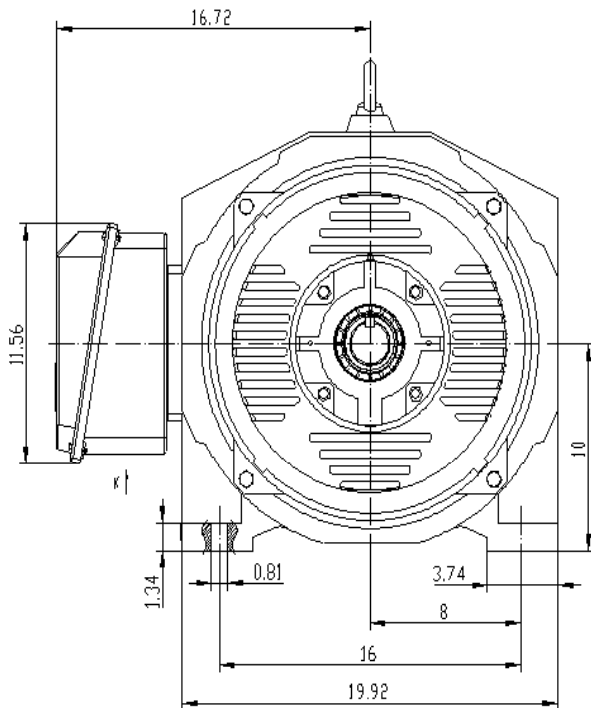






## DRAWINGS

|            |              |                |                      |
|------------|--------------|----------------|----------------------|
| Frame size | <b>405TS</b> | Frame Material | <b>Cast iron</b>     |
| Poles      | <b>2</b>     | DWG NO         | <b>CY231.A16.001</b> |
| Units      | <b>Inch</b>  |                |                      |
|            |              |                |                      |





Vendor Ref. No.

Contractor Ref. No

Project Name:

Contractor Job No.

ELECTRIC PUMP  
CONTROLLER SPECIFICATIONS

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |



# TORNATECH

Project: \_\_\_\_\_

Customer: \_\_\_\_\_

Engineer: \_\_\_\_\_

Pump Manufacturer: \_\_\_\_\_

## Technical Data Submittal Document

### GPx Series

Full Service

Electric Fire Pump Controller



#### Contents:

Data Sheets

Dimensional Data

Wiring Schematics

Field Connections

**Note:** The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.

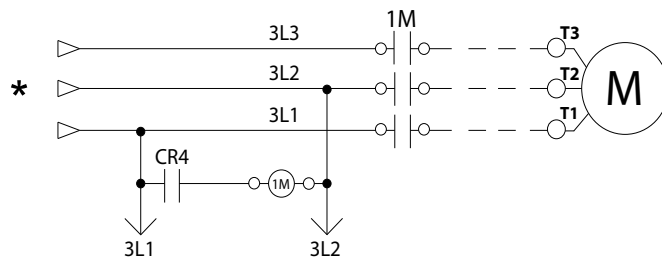


June 2022

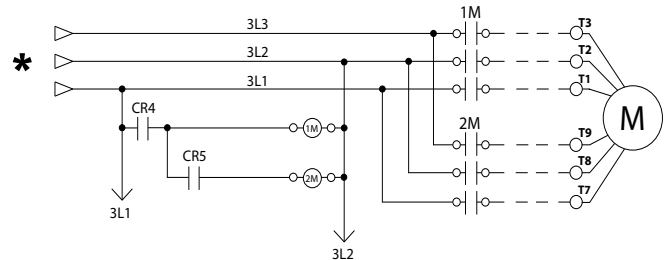


#### Select starting method

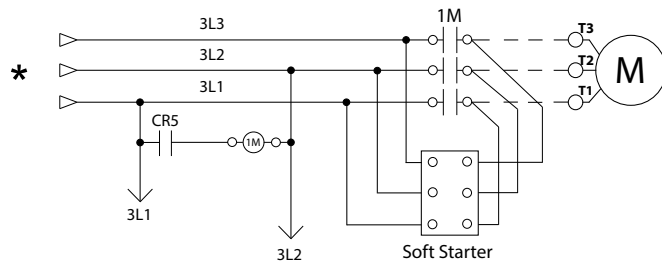
☐ **Model GPA**  
Across the line



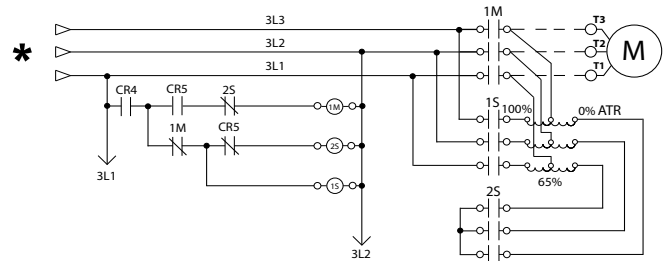
☐ **Model GPP**  
Partwinding



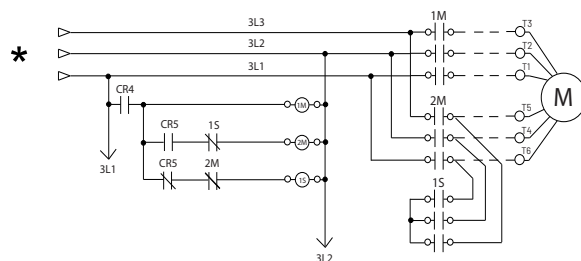
☐ **Model GPS**  
Soft Start Soft Stop



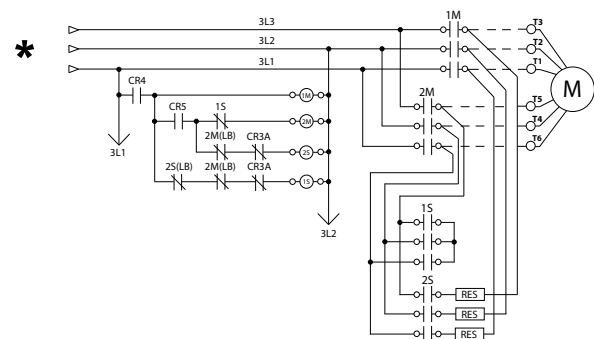
☐ **Model GPR**  
Autotransformer



☒ **Model GPY**  
Wye-Delta Open



☐ **Model GPW**  
Wye-Delta Closed



\*From normal incoming power through Disconnecting Means (IS/CB)





|                                                  |                                                                                                                                        |                                                                         |                                                                                                                                              |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Standard, Listings, Approvals and Certifications | Built to NFPA 20 (latest edition)                                                                                                      |                                                                         |                                                                                                                                              |
|                                                  | Underwriters Laboratory (UL)                                                                                                           | UL218 - Fire Pump Controllers                                           |                                                                                                                                              |
|                                                  | FM Global                                                                                                                              | Class 1321/1323                                                         |                                                                                                                                              |
|                                                  | New York City                                                                                                                          | Accepted for use in the City of New York by the Department of Buildings |                                                                                                                                              |
|                                                  | CE Mark                                                                                                                                | Various EN, IEC & CEE directives and standards                          |                                                                                                                                              |
|                                                  | Built in Canada or U.A.E                                                                                                               |                                                                         | Built in Europe                                                                                                                              |
|                                                  | <input type="checkbox"/> CE Mark Option                                                                                                |                                                                         | Supplied as Standard                                                                                                                         |
| Enclosure                                        | Protection Rating                                                                                                                      |                                                                         |                                                                                                                                              |
|                                                  | Built in Canada or U.A.E                                                                                                               |                                                                         | Built in Europe                                                                                                                              |
|                                                  | <input checked="" type="checkbox"/> Standard: NEMA 2                                                                                   |                                                                         | <input type="checkbox"/> Standard: IP55                                                                                                      |
|                                                  | Optional                                                                                                                               |                                                                         |                                                                                                                                              |
|                                                  | <input type="checkbox"/> NEMA 12                                                                                                       | <input type="checkbox"/> NEMA 4X-304 sst painted                        | <input type="checkbox"/> IP54                                                                                                                |
|                                                  | <input type="checkbox"/> NEMA 3                                                                                                        | <input type="checkbox"/> NEMA 4X-304 sst brushed finish                 | <input type="checkbox"/> IP55                                                                                                                |
|                                                  | <input type="checkbox"/> NEMA 3R                                                                                                       | <input type="checkbox"/> NEMA 4X-316 sst painted                        | <input type="checkbox"/> IP65                                                                                                                |
|                                                  | <input type="checkbox"/> NEMA 4                                                                                                        | <input type="checkbox"/> NEMA 4X-316 sst brushed finish                 | <input type="checkbox"/> IP66                                                                                                                |
|                                                  | Accessories <ul style="list-style-type: none"><li>• Bottom entry gland plate</li><li>• Lifting Lugs</li><li>• Keylock handle</li></ul> |                                                                         | Paint Specifications <ul style="list-style-type: none"><li>• Red RAL3002</li><li>• Powder coating</li><li>• Glossy textured finish</li></ul> |

| Shortcircuit Withstand Rating           | 200V to 208V<br>60Hz | 220V to 240V<br>60Hz | 380V to 415V<br>50 Hz / 60Hz | 440V to 480V<br>60Hz  | 575V to 600V<br>60Hz |
|-----------------------------------------|----------------------|----------------------|------------------------------|-----------------------|----------------------|
|                                         | HP (kw)              |                      |                              |                       |                      |
| <input type="checkbox"/> Standard 100kA | 5 - 150 (3.7 - 110)  | 5 - 200 (3.7 - 149)  | 5 - 300 (3.7 - 223)          | 5 - 400 (3.7 - 298)   | N/A                  |
| <input type="checkbox"/> Optional 150kA |                      |                      |                              |                       |                      |
| <input type="checkbox"/> Standard 50kA  | 200 (149)            | 250 (186)            | 350 - 450 (261 - 335)        | 450 - 500 (335 - 373) | 5 - 500 (3.7 - 373)  |
| <input type="checkbox"/> Optional 100kA | N/A                  | N/A                  | 350 - 500 (261 - 373)        | 450 - 500 (335 - 373) |                      |
| <input type="checkbox"/> Optional 200kA | 5 - 150 (3.7 - 110)  | 5 - 200 (3.7 - 149)  | 5 - 300 (3.7 - 223)          | 5 - 400 (3.7 - 298)   | N/A                  |

\*Please see Disconnecting Means details on page 4



|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ambient Temperature Rating</b>  | <b>Standard:</b><br><input type="checkbox"/> 4°C to 40°C / 39°F to 104°F<br><b>Optional:</b><br><input type="checkbox"/> 4°C to 55°C / 39°F to 131°F<br>Controllers built in Dubai, UAE (Tornatech FZE) are supplied standard with 55°C rating.                                                                                                                                                                                                                                                                                                                                     |
| <b>Surge Suppression</b>           | Surge arrestor rated to suppress surges above line voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Disconnecting Means</b>         | <ul style="list-style-type: none"> <li>Isolating switch and circuit breaker assembly:               <ul style="list-style-type: none"> <li>Door interlocked in the ON position</li> <li>Isolating switch rated not less than 115% of motor full load current</li> <li>Circuit breaker continuous rating not less than 115% of motor full load current</li> <li>Overcurrent sensing non-thermal type, magnetic only</li> <li>Instantaneous trip setting of not more than 20 times the motor full load current</li> </ul> </li> <li>Common flange mounted operating handle</li> </ul> |
| <b>Service Entrance Rating</b>     | Suitable as service entrance equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Emergency Start Handle</b>      | <ul style="list-style-type: none"> <li>Flange mounted</li> <li>Integrated limit switch</li> <li>Pull and latch activation</li> <li>Across the line start (direct on line)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Locked Rotor Protector</b>      | <ul style="list-style-type: none"> <li>Operate shunt trip to open circuit breaker</li> <li>Factory set at 600% of motor full load current</li> <li>Trip between 8 and 20 seconds</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Electrical Readings</b>         | <ul style="list-style-type: none"> <li>Voltage phase to phase (normal power)</li> <li>Amperage of each phase when motor is running</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Pressure Readings</b>           | <ul style="list-style-type: none"> <li>Continuous system pressure display</li> <li>Cut-in and Cut-out pressure settings</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Pressure and Event recorder</b> | <ul style="list-style-type: none"> <li>Pressure readings with date stamp</li> <li>Event recording with date stamp</li> <li>Under regular maintained operation, events are stored in memory for the life of the controller.</li> <li>Data viewable on operator interface display screen</li> <li>Downloadable by USB port to external memory device</li> </ul>                                                                                                                                                                                                                       |
| <b>Pressure Sensing</b>            | <ul style="list-style-type: none"> <li>Pressure transducer and run test solenoid valve assembly for fresh water application</li> <li>Pressure sensing line connection 1/2" Female NPT</li> <li>Drain connection 3/8"</li> <li>Rated for 0-500PSI working pressure (standard display at 0-300PSI)</li> <li>Externally mounted with protective cover</li> </ul>                                                                                                                                                                                                                       |



|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                    |                                                                                                                                                   |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Audible Alarm</b>               | 6" alarm bell - 85 dB at 10ft. (3m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                    |                                                                                                                                                   |
| <b>Visual Indications</b>          | <ul style="list-style-type: none"> <li>• Power available</li> <li>• Motor run</li> <li>• Periodic test</li> <li>• Manual start</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Deluge valve start</li> <li>• Remote automatic start</li> <li>• Remote manual start</li> <li>• Emergency start</li> </ul> | <ul style="list-style-type: none"> <li>• Pump on demand/Automatic start</li> <li>• Pump room temperature (°F or °C)</li> <li>• Lockout</li> </ul> |
| <b>Visual &amp; Audible Alarms</b> | <p>Visual</p> <ul style="list-style-type: none"> <li>• Control voltage not healthy</li> <li>• Invalid cut-in</li> <li>• Lock rotor current</li> <li>• Loss of power</li> <li>• Low ambient temperature</li> <li>• Low water level</li> <li>• Motor trouble</li> <li>• Phase reversal (normal power)</li> </ul> <p>Visual and audible</p> <ul style="list-style-type: none"> <li>• Fail to start</li> </ul> <p>Overcurrent</p> <ul style="list-style-type: none"> <li>• Overcurrent</li> <li>• Overvoltage</li> <li>• Phase loss L1</li> <li>• Phase loss L2</li> <li>• Phase loss L3</li> <li>• Phase unbalanced</li> <li>• Pressure transducer fault detected</li> </ul> <p>Pump on demand</p> <ul style="list-style-type: none"> <li>• Pump on demand</li> <li>• Pump room alarm</li> <li>• Service required</li> <li>• Undercurrent</li> <li>• Undervoltage</li> <li>• Check weekly test solenoid</li> <li>• Weekly test cut-in reached</li> </ul> |                                                                                                                                                                    |                                                                                                                                                   |
| <b>Remote Alarm Contacts</b>       | <p>DPDT-8A-250V.AC</p> <ul style="list-style-type: none"> <li>• Power available</li> <li>• Phase reversal</li> <li>• Motor run</li> <li>• Common pump room alarm (field re-assignable)** <ul style="list-style-type: none"> <li>• Overvoltage</li> <li>• Undervoltage</li> <li>• Phase unbalance</li> <li>• Low pump room temperature</li> <li>• High Pump room temperature</li> </ul> </li> <li>• Common motor trouble (field re-assignable)** <ul style="list-style-type: none"> <li>• Overcurrent</li> <li>• Fail to start</li> <li>• Undercurrent</li> <li>• Ground fault</li> </ul> </li> <li>• Free (field programmable)**</li> </ul>                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                    |                                                                                                                                                   |

\*\*Tornatech reserves the right to use any of these three alarm points for special specific application requirements.



|                                                  |                                                                                                                                                                                                                 |                                                                                                                                                               |                                                                                                                                                                  |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ViZiTouch V2<br/>Operator Interface</b>       | <ul style="list-style-type: none"> <li>• Embedded microcomputer with software PLC logic</li> <li>• 7.0" color touch screen (HMI technology)</li> <li>• Upgradable software</li> <li>• Multi-language</li> </ul> |                                                                                                                                                               |                                                                                                                                                                  |
| <b>Communication<br/>Protocol<br/>Capability</b> | <ul style="list-style-type: none"> <li>• Protocol: Modbus</li> <li>• Connection type: Shielded female connector RJ45</li> <li>• Frame Format: TCP/IP</li> <li>• Addresses: See bulletin MOD-GPx</li> </ul>      |                                                                                                                                                               |                                                                                                                                                                  |
| <b>Operation</b>                                 | <b>Automatic Start</b>                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>• Start on pressure drop</li> <li>• Remote start signal from automatic device</li> <li>• Deluge valve start</li> </ul> |                                                                                                                                                                  |
|                                                  | <b>Manual Start</b>                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Start pushbutton</li> <li>• Run test pushbutton</li> <li>• Remote start from manual device</li> </ul>                |                                                                                                                                                                  |
|                                                  | <b>Stopping</b>                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Manual with Stop pushbutton</li> <li>• Automatic after expiration of minimum run timer ***</li> </ul>                |                                                                                                                                                                  |
|                                                  | <b>Timers</b>                                                                                                                                                                                                   | Field Adjustable & Visual Countdown                                                                                                                           | <ul style="list-style-type: none"> <li>• Minimum run timer ***(off delay)</li> <li>• Sequential start timer (on delay)</li> <li>• Periodic test timer</li> </ul> |
|                                                  | <b>Actuation</b>                                                                                                                                                                                                | Visual Indication                                                                                                                                             | <ul style="list-style-type: none"> <li>• Pressure</li> <li>• Non-pressure</li> </ul>                                                                             |
|                                                  | <b>Mode</b>                                                                                                                                                                                                     |                                                                                                                                                               | <ul style="list-style-type: none"> <li>• Automatic</li> <li>• Non-automatic</li> </ul>                                                                           |

\*\*\*Can only be used if approved by the AHJ





|                          |      |                                                                                                                                                                                                                                    |                          |      |                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | A4   | Flow switch provision                                                                                                                                                                                                              | <input type="checkbox"/> | C19  | Emergency start alarm contact (DPDT)                                                                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/> | A8   | Foam pump application w/o pressure transducer and run test solenoid valve.                                                                                                                                                         | <input type="checkbox"/> | C20  | Manual start alarm contact (DPDT)                                                                                                                                                                                                                                                                                                                                                        |
| <input type="checkbox"/> | A9   | Low zone pump control function                                                                                                                                                                                                     | <input type="checkbox"/> | C21  | Deluge valve start alarm contact (DPDT)                                                                                                                                                                                                                                                                                                                                                  |
| <input type="checkbox"/> | A10  | Middle zone pump control function                                                                                                                                                                                                  | <input type="checkbox"/> | C22  | Remote automatic start alarm contact (DPDT)                                                                                                                                                                                                                                                                                                                                              |
| <input type="checkbox"/> | A11  | High zone pump control function                                                                                                                                                                                                    | <input type="checkbox"/> | C23  | Remote manual start alarm contact (DPDT)                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> | A13  | Non-pressure actuated controller w/o pressure transducer and run test solenoid valve                                                                                                                                               | <input type="checkbox"/> | C24  | High pump room temperature alarm contact (DPDT)                                                                                                                                                                                                                                                                                                                                          |
| <input type="checkbox"/> | A16  | Lockout/interlock circuit from equipment installed inside the pump room                                                                                                                                                            | <input type="checkbox"/> | C25  | Second set of standard alarm contacts (DPDT) (Typical for city of Los Angeles and Denver)                                                                                                                                                                                                                                                                                                |
| <input type="checkbox"/> | B11  | Built in alarm panel (120V.AC supervisory power) providing indication for:<br>• Audible alarm & silence pushbutton for motor run, phase reversal, loss of phase.<br>• Pilot lights for loss of phase & supervisory power available | <input type="checkbox"/> | Cx   | Additional visual and alarm contact (Specify function) (DPDT)                                                                                                                                                                                                                                                                                                                            |
| <input type="checkbox"/> | B11B | Built in alarm panel same as B11 but 220-240VAC supervisory power                                                                                                                                                                  | <input type="checkbox"/> | D1   | Low suction pressure transducer for fresh water rated at 0-300PSI with visual indication and alarm contact                                                                                                                                                                                                                                                                               |
| <input type="checkbox"/> | B19A | High motor temperature c/w thermostat relay and alarm contacts (DPDT)                                                                                                                                                              | <input type="checkbox"/> | D1A  | Low suction pressure transducer for sea water rated at 0-300PSI with visual indication and alarm contact                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> | B19B | High motor temperature c/w PT100 relay and alarm contacts (DPDT)                                                                                                                                                                   | <input type="checkbox"/> | D5   | Pressure transducer and run test solenoid valve for fresh water rated for 0-500PSI (for factory calibration purposes only)                                                                                                                                                                                                                                                               |
| <input type="checkbox"/> | B21  | Ground fault alarm detection c/w visual indication and alarm contact (DPDT)                                                                                                                                                        | <input type="checkbox"/> | D5D  | Pressure transducer and run test solenoid valve for sea water rated for 0-500PSI                                                                                                                                                                                                                                                                                                         |
| <input type="checkbox"/> | C1   | Extra motor run alarm contact (DPDT)                                                                                                                                                                                               | <input type="checkbox"/> | D10  | Omit mounting feet (when applicable)                                                                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/> | C4   | Periodic test alarm contact (DPDT)                                                                                                                                                                                                 | <input type="checkbox"/> | D13  | High withstand rating for:<br>• 200V to 208V @ 150HP max. = 150kA*<br>• 200V to 208V @ 200HP = 100kA*<br>• 220V to 240V @ 200HP max. = 150kA*<br>• 220V to 240V @ 250HP = 100kA*<br>• 380V to 415V @ 300HP max. = 150kA*<br>• 380V to 415V @ 350HP to 450HP = 100kA*<br>• 440V to 480V @ 400HP max. = 150kA*<br>• 440V to 480V @ 450HP to 500HP = 100kA*<br>• 600V @ 500HP max. = 100kA* |
| <input type="checkbox"/> | C6   | Low discharge pressure alarm contact (DPDT)                                                                                                                                                                                        | <input type="checkbox"/> | D13A | High withstand rating for:<br>• 380V to 480V = 65kA*<br>• 600V = 25kA*                                                                                                                                                                                                                                                                                                                   |
| <input type="checkbox"/> | C7   | Low pump room temperature alarm contact (DPDT)                                                                                                                                                                                     | <input type="checkbox"/> | D13B | High withstand rating for:<br>• 200V to 208V @ 150HP max. = 200kA*<br>• 220V to 240V @ 200HP max. = 200kA*<br>• 380V to 415V @ 300HP max. = 200kA*<br>• 440V to 480V @ 400HP max. = 200kA*                                                                                                                                                                                               |
| <input type="checkbox"/> | C10  | Low water reservoir level alarm contact (DPDT)                                                                                                                                                                                     | <input type="checkbox"/> | D14  | Anti-condensation heater & thermostat                                                                                                                                                                                                                                                                                                                                                    |
| <input type="checkbox"/> | C11  | High electric motor temperature alarm contact (DPDT)                                                                                                                                                                               | <input type="checkbox"/> | D14A | Anti-condensation heater & humidistat                                                                                                                                                                                                                                                                                                                                                    |
| <input type="checkbox"/> | C12  | High electric motor vibration c/w visual indication and alarm contact (DPDT)                                                                                                                                                       | <input type="checkbox"/> | D14B | Anti-condensation heater & thermostat & humidistat                                                                                                                                                                                                                                                                                                                                       |
| <input type="checkbox"/> | C14  | Pump on demand / automatic start alarm contact (DPDT)                                                                                                                                                                              |                          |      |                                                                                                                                                                                                                                                                                                                                                                                          |
| <input type="checkbox"/> | C15  | Pump fail to start alarm contact (DPDT)                                                                                                                                                                                            |                          |      |                                                                                                                                                                                                                                                                                                                                                                                          |
| <input type="checkbox"/> | C16  | Control voltage healthy alarm contact (DPDT)                                                                                                                                                                                       |                          |      |                                                                                                                                                                                                                                                                                                                                                                                          |
| <input type="checkbox"/> | C17  | Flow meter valve loop open c/w visual indication and alarm contact (DPDT)                                                                                                                                                          |                          |      |                                                                                                                                                                                                                                                                                                                                                                                          |
| <input type="checkbox"/> | C18  | High water reservoir level c/w visual indication and alarm contact (DPDT)                                                                                                                                                          |                          |      |                                                                                                                                                                                                                                                                                                                                                                                          |

\*For fire pump controller section only.

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.



|                               |                                                                                        |
|-------------------------------|----------------------------------------------------------------------------------------|
| <input type="checkbox"/> D15  | Tropicalization                                                                        |
| <input type="checkbox"/> D18  | CE Mark with factory certificate                                                       |
| <input type="checkbox"/> D26  | Modbus with RTU frame format and RS485 connection                                      |
| <input type="checkbox"/> D27  | Motor heater connection (external single phase power source and heater on/off contact) |
| <input type="checkbox"/> D27A | Motor heater connection (internal single phase power source and heater on/off contact) |
| <input type="checkbox"/> D28  | Customized drawing set                                                                 |
| <input type="checkbox"/> D34A | Field programmable I/O board - 5 Input / 5 output                                      |
| <input type="checkbox"/> D43  | Seismic Certification compliant to CBC 2019, IBC 2018 rigid base/wall mounted only     |
| <input type="checkbox"/> D44  | Special Seismic Certification compliant to OSHPD rigid base/wall mounted only          |

|                              |                                        |
|------------------------------|----------------------------------------|
| <input type="checkbox"/> L01 | Other language and English (bilingual) |
| <input type="checkbox"/> L02 | French                                 |
| <input type="checkbox"/> L03 | Spanish                                |
| <input type="checkbox"/> L04 | German                                 |
| <input type="checkbox"/> L05 | Italian                                |
| <input type="checkbox"/> L06 | Polish                                 |
| <input type="checkbox"/> L07 | Romanian                               |
| <input type="checkbox"/> L08 | Hungarian                              |
| <input type="checkbox"/> L09 | Slovak                                 |
| <input type="checkbox"/> L10 | Croatian                               |
| <input type="checkbox"/> L11 | Czech                                  |
| <input type="checkbox"/> L12 | Portuguese                             |
| <input type="checkbox"/> L13 | Dutch                                  |
| <input type="checkbox"/> L14 | Russian                                |
| <input type="checkbox"/> L15 | Turkish                                |
| <input type="checkbox"/> L16 | Swedish                                |
| <input type="checkbox"/> L17 | Bulgarian                              |
| <input type="checkbox"/> L18 | Thai                                   |
| <input type="checkbox"/> L19 | Indonesian                             |
| <input type="checkbox"/> L20 | Slovenian                              |
| <input type="checkbox"/> L21 | Danish                                 |
| <input type="checkbox"/> L22 | Greek                                  |
| <input type="checkbox"/> L23 | Arabic                                 |
| <input type="checkbox"/> L24 | Hebrew                                 |
| <input type="checkbox"/> L25 | Chinese                                |

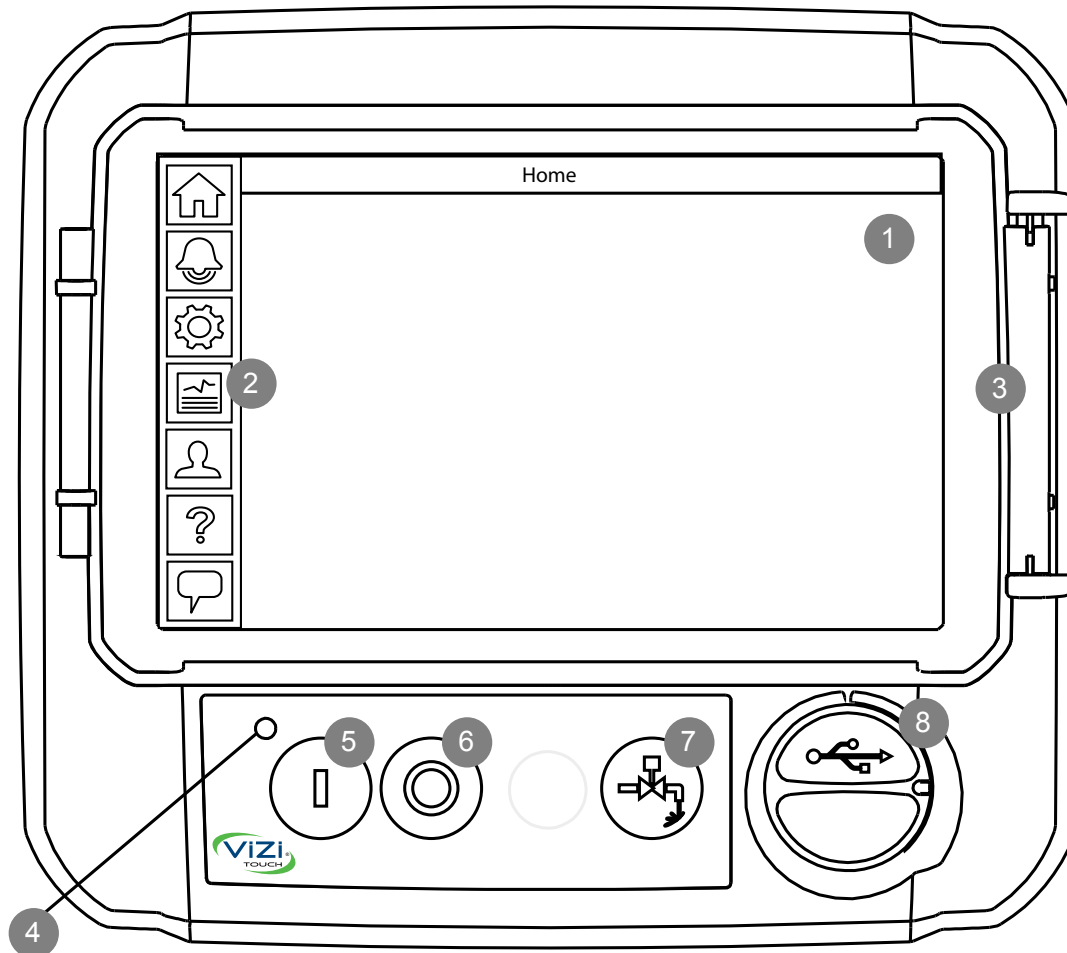
Additional Options:

|                          |       |
|--------------------------|-------|
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |
| <input type="checkbox"/> | _____ |

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.



#### ViZiTouch V2 Operator Interface



1 - Color touch screen

2 - Onscreen menu

- HOME page
- ALARM page
- CONFIGURATION page
- HISTORY page
- SERVICE page
- MANUAL page
- LANGUAGES page

3 - Screen protector

4 - Power LED (3 colors)

5 - START button

6 - STOP button

7 - RUN TEST button

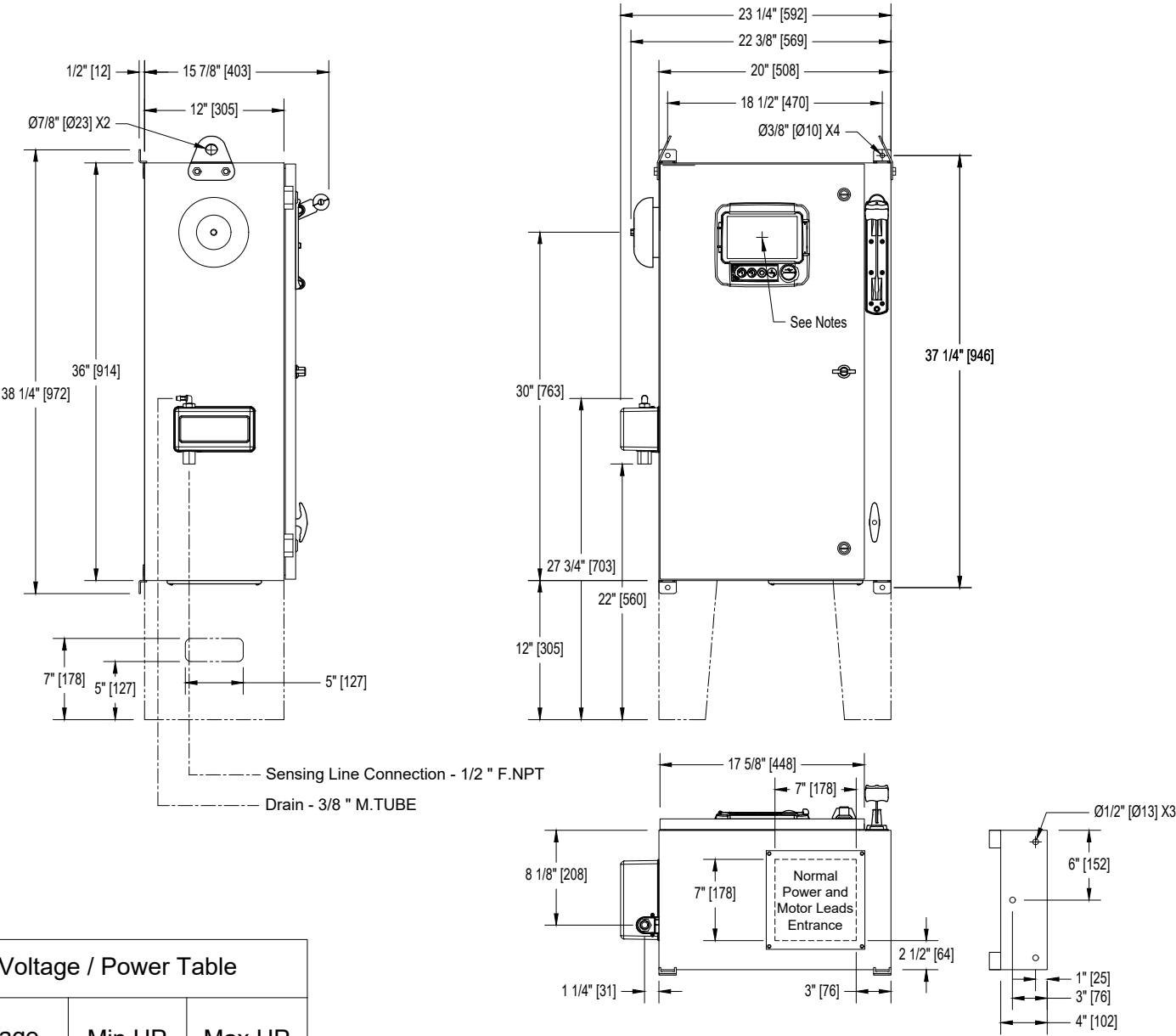
8 - USB port

Electric Fire Pump Controller

Model:GPA/GPY

Dimensions

Built to the latest edition of the NFPA 20 standard

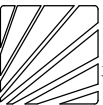


| Voltage / Power Table |        |        |
|-----------------------|--------|--------|
| Voltage               | Min HP | Max HP |
| 208                   | 5      | 30     |
| 220 - 240             | 5      | 30     |
| 380 - 400 - 415       | 5      | 60     |
| 440 - 480             | 5      | 60     |
| 600                   | 5      | 75     |

Notes:

- Standard NEMA: NEMA 2
- Standard paint : textured red RAL 3002.
- All dimensions are in inches [millimeters].
- Center of ViZiTouCh screen: 29-5/8" [751] from bottom (no feet).
- Bottom conduit entrance through removable gland plate recommended.
- Use watertight conduit and connector only.
- Protect equipment against drilling chips.
- Door swing equal to door width.

Drawing for information only.  
Manufacturer reserves the right to modify this drawing without notice.  
Contact manufacturer for "As Built" drawing.



| REV. | DESCRIPTION                     | DD/MM/YY | Drawing number |
|------|---------------------------------|----------|----------------|
| 3.   | Removed Seismic logo (optional) | 18/05/22 | GPX-DI161 /E   |
| 2.   | New Logo                        | 10/05/18 |                |
| 1.   | Valve Change                    | 21/11/17 |                |

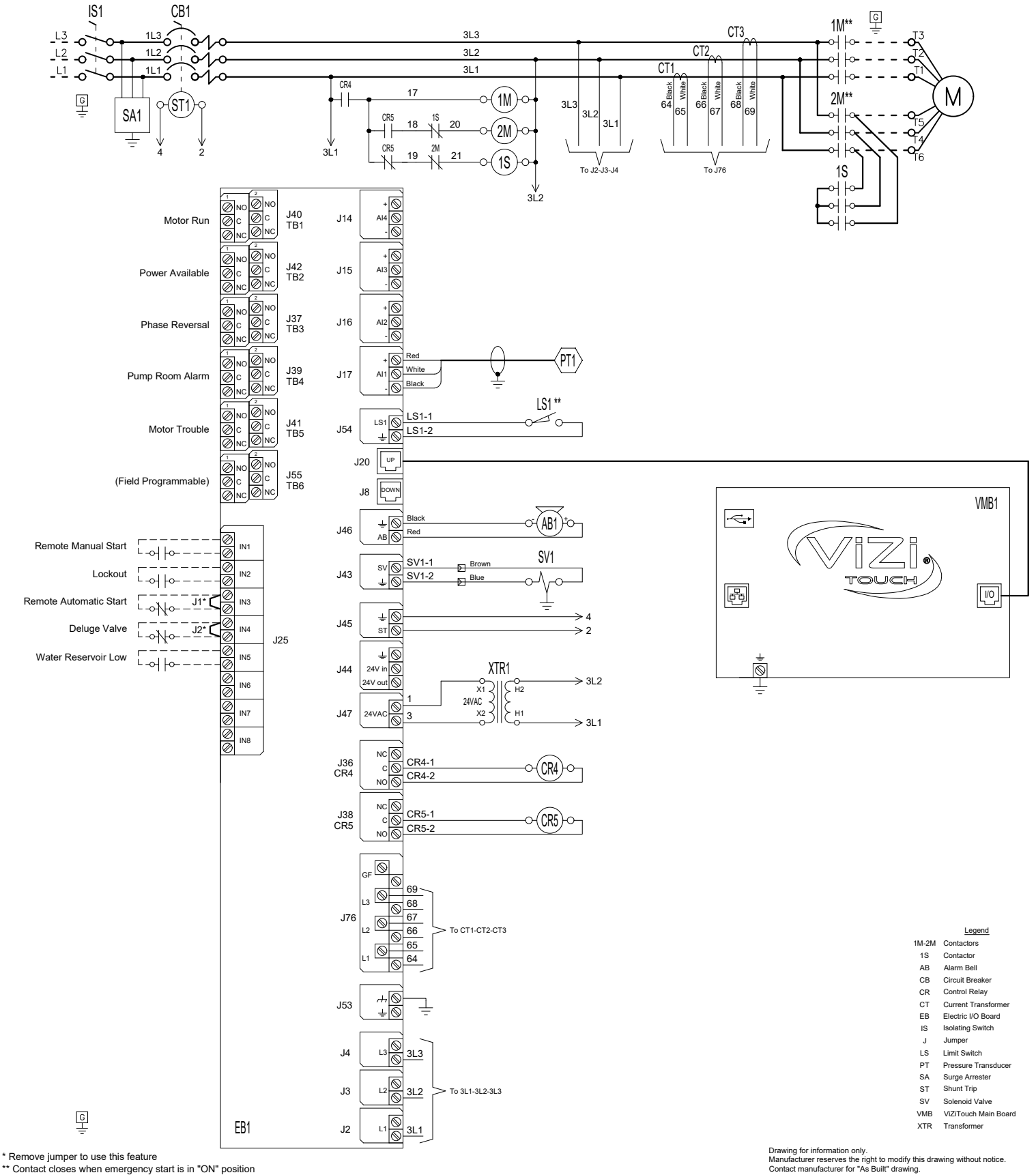


Electric Fire Pump Controller  
Reduced Voltage / Wye-Delta (Open Transition)

Model: GPY

Wiring schematic

Built to the latest edition of the NFPA 20 standard



\* Remove jumper to use this feature  
\*\* Contact closes when emergency start is in "ON" position

Drawing for information only.  
Manufacturer reserves the right to modify this drawing without notice.  
Contact manufacturer for "As Built" drawing.

| REV. | DESCRIPTION                                         | DD/MM/YY | Drawing number |
|------|-----------------------------------------------------|----------|----------------|
| 3    | Removed Seismic logo (optional)                     | 18/05/22 | GPY-WS600 /E   |
| 2    | Update Logo                                         | 23/04/18 |                |
| 1    | Removed (fail safe) text from Power Available relay | 20/02/17 |                |

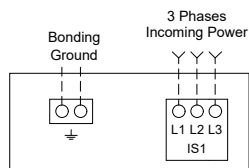


Model: GPX

### Terminal Diagram and Sizing for Isolating Switch

Built to the latest edition of the NFPA 20 standard

## Power Terminals



Notes:

- 1 - For proper wire sizing, refer to NFPA70 and NEC (USA) or CEC (Canada) or local code.
- 2 - Controller suitable for service entrance in USA.
- 3 - For more accurate motor connections refer to motor manufacturer or motor nameplate.
- 4 - Controller is phase sensitive. Incoming lines must be connected in ABC sequence.

**COPPER CONDUCTORS** for Isolating Switch (IS1).

Field Wiring According to Bending Space (AWG or MCM). Terminals L1 - L2 - L3

| Bending Space | 5 " (127 mm)   |                |                |                |                |               |               | 8 " (203 mm)    |                 |                 |
|---------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|-----------------|-----------------|-----------------|
| HP<br>Voltage | 5              | 7.5            | 10             | 15             | 20             | 25            | 30            | 40              | 50              | 60              |
| 208           | 1x (10 to 1/0) | 1x (8 to 1/0)  | 1x (8 to 1/0)  | 1x (6 to 1/0)  | 1x (4 to 1/0)  | 1x (3 to 1/0) | 1x (2 to 1/0) | 1x (1/0 to 3/0) | 1x (3/0 to 250) | 1x (4/0 to 250) |
| 220 to 240    | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (8 to 1/0)  | 1x (6 to 1/0)  | 1x (4 to 1/0)  | 1x (4 to 1/0) | 1x (3 to 1/0) | 1x (1 to 3/0)   | 1x (2/0 to 3/0) | 1x (3/0 to 250) |
| 380 to 416    | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (8 to 1/0)  | 1x (8 to 1/0)  | 1x (6 to 1/0) | 1x (6 to 1/0) | 1x (4 to 1/0)   | 1x (3 to 1/0)   | 1x (3 to 1/0)   |
| 440 to 480    | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (8 to 1/0)  | 1x (8 to 1/0) | 1x (6 to 1/0) | 1x (6 to 1/0)   | 1x (4 to 1/0)   | 1x (3 to 1/0)   |
| 600           | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (8 to 1/0) | 1x (8 to 1/0) | 1x (6 to 1/0)   | 1x (6 to 1/0)   | 1x (4 to 1/0)   |

| Bending Space | 12 " (305 mm)   |                 |                 |                 | 16 " (406 mm)   |                 |                 |                 |                 |                 |                 |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| HP<br>Voltage | 75              | 100             | 125             | 150             | 200             | 250             | 300             | 350             | 400             | 450             | 500             |
| 208           | 2x (1/0 to 500) | 2x (2/0 to 500) | 2x (4/0 to 500) | 2x (250 to 500) | 3x (4/0 to 500) | -----           | -----           | -----           | -----           | -----           | -----           |
| 220 to 240    | 1x (250)        | 2x (2/0 to 500) | 2x (3/0 to 500) | 2x (4/0 to 500) | 2x (350 to 500) | 3x (250 to 500) | -----           | -----           | -----           | -----           | -----           |
| 380 to 416    | 1x (1/0 to 3/0) | 1x (3/0 to 250) | 1x (250)        | 2x (1/0 to 500) | 2x (3/0 to 500) | 2x (4/0 to 500) | 2x (300 to 500) | 2x (400 to 500) | 3x (250 to 500) | 3x (300 to 500) | -----           |
| 440 to 480    | 1x (1 to 3/0)   | 1x (2/0 to 3/0) | 1x (3/0 to 250) | 1x (4/0 to 250) | 2x (1/0 to 500) | 2x (3/0 to 500) | 2x (4/0 to 500) | 2x (300 to 500) | 2x (350 to 500) | 2x (400 to 500) | 3x (250 to 500) |
| 600           | 1x (3 to 1/0)   | 1x (1 to 3/0)   | 1x (2/0 to 3/0) | 1x (3/0 to 250) | 1x (250)        | 2x (2/0 to 500) | 2x (3/0 to 500) | 2x (4/0 to 500) | 2x (250 to 500) | 2x (300 to 500) | 2x (350 to 500) |
| Bending Space | 5 " (127 mm)    | 8 " (203 mm)    |                 |                 |                 | 12 " (305 mm)   |                 |                 |                 |                 |                 |

**ALUMINUM CONDUCTORS** for Isolating Switch (IS1).

Field Wiring According to Bending Space (AWG or MCM). Terminals L1 - L2 - L3

| Bending Space | 5" (127 mm)    |                |                |                |               |               |               | 8" (203 mm)     |                 | 10" (254 mm)                    |
|---------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|-----------------|-----------------|---------------------------------|
| HP<br>Voltage | 5              | 7.5            | 10             | 15             | 20            | 25            | 30            | 40              | 50              | 60                              |
| 208           | 1x (10 to 1/0) | 1x (6 to 1/0)  | 1x (6 to 1/0)  | 1x (4 to 1/0)  | 1x (3 to 1/0) | 1x (1 to 1/0) | 1x (1/0)      | 1x (3/0)        | 1x (4/0 to 250) | 1x (300) ** or<br>1x (250) 90°C |
| 220 to 240    | 1x (10 to 1/0) | 1x (8 to 1/0)  | 1x (6 to 1/0)  | 1x (4 to 1/0)  | 1x (3 to 1/0) | 1x (2 to 1/0) | 1x (1 to 1/0) | 1x (2/0 to 3/0) | 1x (3/0) 90°C * | 1x (250)                        |
| 380 to 416    | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (6 to 1/0)  | 1x (6 to 1/0) | 1x (4 to 1/0) | 1x (4 to 1/0) | 1x (2 to 1/0)   | 1x (1 to 1/0)   | 1x (1/0)                        |
| 440 to 480    | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (8 to 1/0)  | 1x (6 to 1/0) | 1x (6 to 1/0) | 1x (6 to 1/0) | 1x (4 to 1/0)   | 1x (2 to 1/0)   | 1x (1 to 1/0)                   |
| 600           | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (10 to 1/0) | 1x (8 to 1/0) | 1x (6 to 1/0) | 1x (6 to 1/0) | 1x (4 to 1/0)   | 1x (4 to 1/0)   | 1x (2 to 1/0)                   |

| Bending Space | 12 " (305 mm)      |                 |                    |                                      | 16 " (406 mm)   |                 |                 |                                       |                 |                 |                 |
|---------------|--------------------|-----------------|--------------------|--------------------------------------|-----------------|-----------------|-----------------|---------------------------------------|-----------------|-----------------|-----------------|
| HP            | 75                 | 100             | 125                | 150                                  | 200             | 250             | 300             | 350                                   | 400             | 450             | 500             |
| Voltage       | 208                | 2x (2/0 to 500) | 2x (300 to 500)    | 2x (350 to 500)                      | 3x (300 to 500) | -----           | -----           | -----                                 | -----           | -----           | -----           |
| 220 to 240    | 1x (350) **<br>N/A | 2x (3/0 to 500) | 2x (250 to 500)    | 2x (300 to 500)                      | 2x (500)        | 3x (400 to 500) | -----           | -----                                 | -----           | -----           | -----           |
| 380 to 416    | 1x (3/0)           | 1x (250 to 350) | 1x (350) **<br>N/A | 2x (3/0 to 500)                      | 2x (4/0 to 500) | 2x (300 to 500) | 2x (500)        | 3x (300 to 500) **<br>2x (500) 90°C * | 3x (350 to 500) | 3x (400 to 500) | -----           |
| 440 to 480    | 1x (1/0 to 3/0)    | 1x (3/0)        | 1x (250)           | 1x (300 to 350)**<br>1x (250) 90°C * | 2x (3/0 to 500) | 2x (250 to 500) | 2x (300 to 500) | 2x (400 to 500)                       | 2x (500)        | 2x (500) 90°C * | 3x (350 to 500) |
| 600           | 1x (1 to 1/0)      | 1x (2/0 to 3/0) | 1x (3/0) 90°C *    | 1x (4/0 to 250)                      | 1x (350 to 500) | 2x (3/0 to 500) | 2x (4/0 to 250) | 2x (300 to 500)                       | 2x (350 to 500) | 2x (400 to 500) | 2x (500)        |
| Bending Space | 5 " (127 mm)       | 8 " (203 mm)    |                    |                                      | 12 " (305 mm)   |                 |                 |                                       |                 |                 |                 |

\*For standard enclosure, use 90°C aluminium wire. Consult Factory for Use of Conductors Rated Lower than 90°C

\*\* Consult Factory

Drawing for information only.  
 Manufacturer reserves the right to modify this drawing without notice.  
 Contact manufacturer for "As Built" drawing



| REV. | DESCRIPTION                     | DD/MM/YY | Drawing number   |
|------|---------------------------------|----------|------------------|
| 1    | Removed Seismic logo (optional) | 18/05/22 | GPX-TD612 1/2 /E |
| 0    | First issue                     | 22/12/20 |                  |

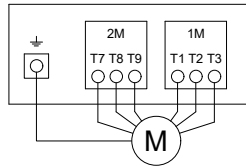
# Electric Fire Pump Controller

# Model: GPX

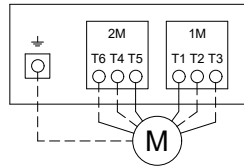
Terminal Diagram and Sizing For GPP,GPY & GPW

Built to the latest edition of the NFPA 20 standard

## Motor Terminals



Model : GPP



Models : GPW & GPY

### Notes:

- 1 - For proper wire sizing, refer to NFPA70 and NEC (USA) or CEC (Canada) or local code.
- 2 - Controller suitable for service entrance in USA.
- 3 - For more accurate motor connections refer to motor manufacturer or motor nameplate.
- 4 - Controller is phase sensitive. Incoming lines must be connected in ABC sequence.

## COPPER CONDUCTORS for Motor Connection (1M-2M).

Field Wiring According to Bending Space (AWG or MCM). Terminals T1-T2-T3-T4-T5-T6-T7-T8-T9

| HP<br>Voltage | 5            | 7.5          | 10           | 15           | 20           | 25           | 30           | 40            | 50            | 60            |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| 208           | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (8 to 4)  | 1x (8 to 4)  | 1x (6 to 4)  | 1x (6 to 4)  | 1x (4 to 2/0) | 1x (2 to 2/0) | 1x (1 to 2/0) |
| 220 to 240    | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (8 to 4)  | 1x (8 to 4)  | 1x (6 to 4)  | 1x (6 to 4)  | 1x (4)        | 1x (3 to 2/0) | 1x (2 to 2/0) |
| 380 to 416    | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (8 to 4)  | 1x (8 to 4)   | 1x (6 to 4)   | 1x (4)        |
| 440 to 480    | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (8 to 4)   | 1x (8 to 4)   | 1x (6 to 4)   |
| 600           | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4) | 1x (10 to 4)  | 1x (8 to 4)   | 1x (8 to 4)   |

| HP<br>Voltage | 75              | 100             | 125             | 150             | 200             | 250             | 300             | 350             | 400             | 450             | 500             |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 208           | 1x (2/0 to 3/0) | 1x (3/0 to 300) | 1x (250 to 300) | 2x (1/0 to 300) | 2x (3/0 to 350) | -----           | -----           | -----           | -----           | -----           | -----           |
| 220 to 240    | 1x (1/0 to 2/0) | 1x (3/0)        | 1x (4/0 to 300) | 1x (300)        | 2x (2/0 to 300) | 2x (4/0 to 350) | -----           | -----           | -----           | -----           | -----           |
| 380 to 416    | 1x (4 to 2/0)   | 1x (2 to 2/0)   | 1x (1/0 to 2/0) | 1x (2/0 to 3/0) | 1x (4/0 to 300) | 1x (300)        | 2x (2/0 to 300) | 2x (3/0 to 300) | 2x (4/0 to 350) | 2x (4/0 to 350) | -----           |
| 440 to 480    | 1x (4 to 2/0)   | 1x (3 to 2/0)   | 1x (2 to 2/0)   | 1x (1/0 to 3/0) | 1x (2/0 to 3/0) | 1x (4/0 to 300) | 1x (300)        | 2x (1/0 to 300) | 2x (2/0 to 300) | 2x (3/0 to 350) | 2x (4/0 to 350) |
| 600           | 1x (6 to 4)     | 1x (4)          | 1x (3 to 2/0)   | 1x (2 to 2/0)   | 1x (1/0 to 3/0) | 1x (2/0 to 3/0) | 1x (4/0 to 300) | 1x (250 to 300) | 1x (300)        | 2x (1/0 to 300) | 2x (2/0 to 300) |

## ALUMINUM CONDUCTORS for Contactor (1M-2M).

Field Wiring According to Bending Space (AWG or MCM). Terminals T1-T2-T3-T4-T5-T6-T7-T8-T9

| HP<br>Voltage | 5                 | 7.5               | 10                | 15                | 20                | 25                | 30                | 40               | 50               | 60               |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|------------------|
| 208           | 1x (12 to 2/0) ** | 1x (10 to 2/0) ** | 1x (10 to 2/0) ** | 1x (8 to 2/0) **  | 1x (6 to 2/0) **  | 1x (4 to 2/0) **  | 1x (4 to 2/0) **  | 1x (2 to 2/0)    | 1x (1/0 to 2/0)  | 1x (2/0)         |
| 220 to 240    | 1x (12 to 2/0) ** | 1x (10 to 2/0) ** | 1x (10 to 2/0) ** | 1x (8 to 2/0) **  | 1x (8 to 2/0) **  | 1x (6 to 2/0) **  | 1x (4 to 2/0) **  | 1x (2 to 2/0) ** | 1x (1 to 2/0)    | 1x (1/0 to 2/0)  |
| 380 to 416    | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (10 to 2/0) ** | 1x (10 to 2/0) ** | 1x (8 to 2/0) **  | 1x (8 to 2/0) **  | 1x (6 to 2/0) ** | 1x (4 to 2/0) ** | 1x (3 to 2/0) ** |
| 440 to 480    | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (10 to 2/0) ** | 1x (10 to 2/0) ** | 1x (8 to 2/0) **  | 1x (8 to 2/0) ** | 1x (6 to 2/0) ** | 1x (4 to 2/0) ** |
| 600           | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (12 to 2/0) ** | 1x (10 to 2/0) ** | 1x (10 to 2/0) ** | 1x (10 to 2/0) ** | 1x (8 to 2/0) ** | 1x (8 to 2/0) ** | 1x (6 to 2/0) ** |

| HP<br>Voltage | 75               | 100              | 125             | 150             | 200             | 250             | 300             | 350             | 400             | 450             | 500             |
|---------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 208           | 1x (3/0)         | Consult Factory  | 1x (300) 90°C * | 2x (3/0 to 300) | 2x (250 to 350) | -----           | -----           | -----           | -----           | -----           | -----           |
| 220 to 240    | 1x (2/0) 90°C *  | Consult Factory  | 1x (300)        | 1x (300) 90°C * | 2x (4/0 to 300) | 2x (300 to 350) | -----           | -----           | -----           | -----           | -----           |
| 380 to 416    | 1x (2 to 2/0)    | 1x (1/0 to 2/0)  | 1x (1/0 to 2/0) | 1x (3/0) 90°C * | 1x (300)        | 1x (300) 90°C * | 2x (4/0 to 300) | 2x (250 to 300) | 2x (300 to 350) | 2x (300 to 350) | -----           |
| 440 to 480    | 1x (3 to 2/0) ** | 1x (2 to 2/0)    | 1x (2/0) 90°C * | 1x (2/0 to 3/0) | 1x (3/0) 90°C * | 1x (300)        | 1x (300) 90°C * | 2x (3/0 to 300) | 2x (4/0 to 300) | 2x (250 to 350) | 2x (300 to 350) |
| 600           | 1x (4 to 2/0) ** | 1x (3 to 2/0) ** | 1x (2 to 2/0)   | 1x (1/0 to 3/0) | 1x (3/0)        | 1x (3/0) 90°C * | 1x (300)        | 1x (300) 90°C * | Consult Factory | 2x (3/0 to 300) | 2x (4/0 to 300) |

\*For standard enclosure, use 90°C aluminium wire. Consult Factory for Use of Conductors Rated Lower than 90°C.

\*\*Option V659 required.

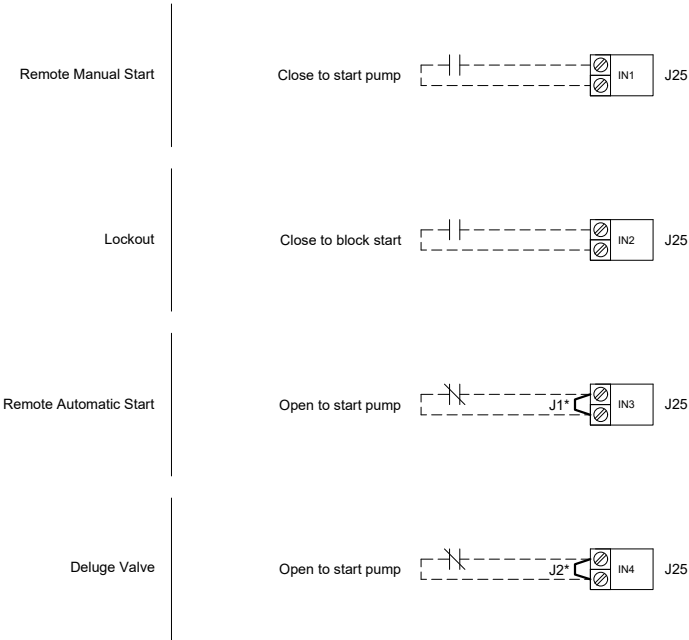
Drawing for information only.  
Manufacturer reserves the right to modify this drawing without notice.  
Contact manufacturer for "As Built" drawing.



| REV. | DESCRIPTION                     | DD/MM/YY | Drawing number   |
|------|---------------------------------|----------|------------------|
| 1    | Removed Seismic logo (optional) | 18/05/22 | GPX-TD612 2/2 /E |
| 0    | First issue                     | 22/12/20 |                  |

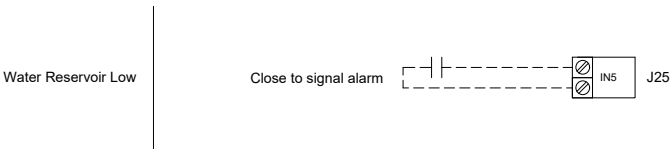
Control Terminals (EB1)

Terminals Wire Size:  
24 - 12 AWG  
0.5 Nm



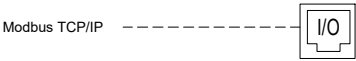
Alarm Inputs (EB1)

Terminals Wire Size:  
24 - 12 AWG  
0.5 Nm



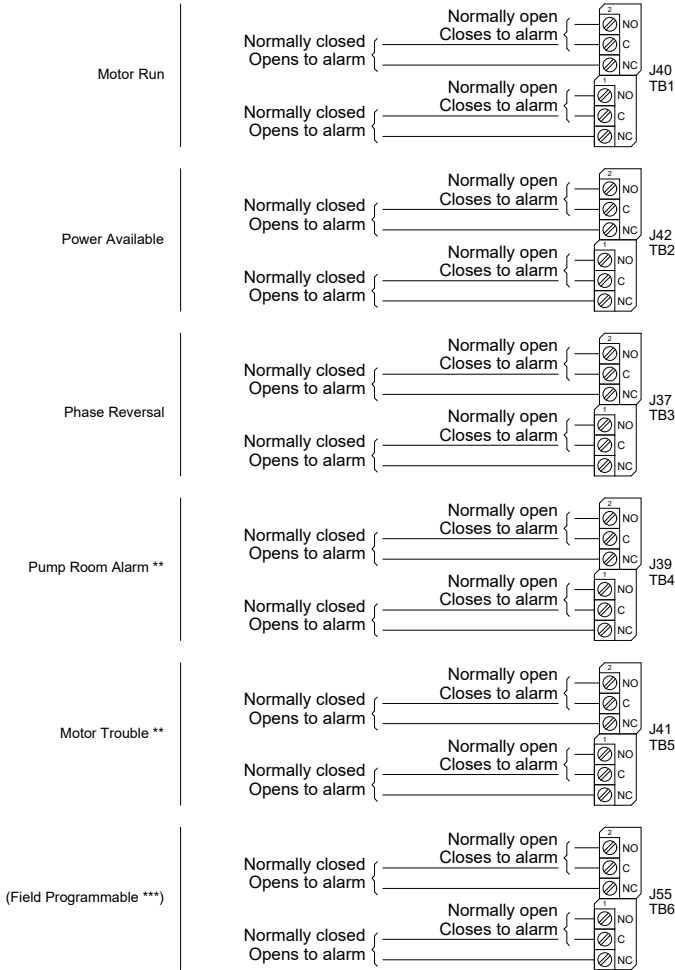
Network Connection (VMB1)

Shielded Female Connector RJ45



Remote Alarm Terminals (EB1)

Terminals Wire Size:  
24 - 12 AWG  
0.5 Nm



\* Remove jumper to use this feature  
\*\* Re-assignable  
\*\*\* Not available on GPS models

Drawing for information only.  
Manufacturer reserves the right to modify this drawing without notice.  
Contact manufacturer for "As Built" drawing.





|               |  |                     |  |
|---------------|--|---------------------|--|
|               |  | Vendor Ref. No.     |  |
|               |  |                     |  |
|               |  | Contractor Ref. No. |  |
| Project Name: |  | Contractor Job No.  |  |

JOCKEY PUMP

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

# PACIFIC STAINLESS STEEL WATER PUMP



HIGH PERFORMANCE PUMPS FOR ALL WATER APPLICATIONS

## Product introduction

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## Construction

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## Instruction and codes

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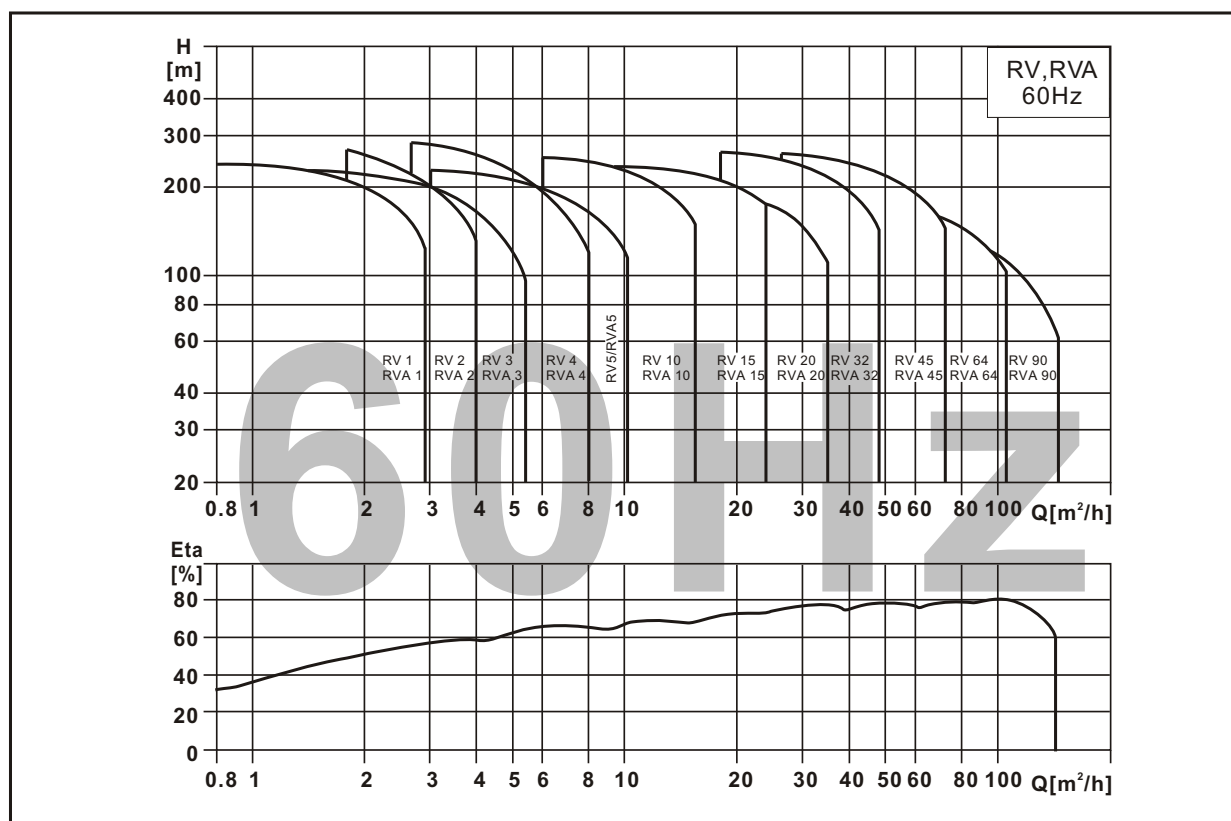
## Performance Curves and Technical Data

|            |       |
|------------|-------|
| RVA1 ..... | 16~17 |
| RV1 .....  | 18~19 |
| RVA2 ..... | 20~21 |
| RV2 .....  | 22~23 |
| RVA3 ..... | 24~25 |
| RV3 .....  | 26~27 |
| RVA4 ..... | 28~29 |
| RV4 .....  | 30~31 |

|                          |       |
|--------------------------|-------|
| RVA5 .....               | 32~33 |
| RV5 .....                | 34~35 |
| RVA10 .....              | 36~37 |
| RV10 .....               | 38~39 |
| RVA15 .....              | 40~41 |
| RV15 .....               | 42~43 |
| RVA20 .....              | 44~45 |
| RV20 .....               | 46~47 |
| RVA32 .....              | 48~49 |
| RV32 .....               | 50~51 |
| RVA45 .....              | 52~53 |
| RV45 .....               | 54~55 |
| RVA64 .....              | 56~57 |
| RV64 .....               | 58~59 |
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# Product introduction

## Performance range





## Applications

| Application                                            | RVA | RV |
|--------------------------------------------------------|-----|----|
| <b>Water supply</b>                                    |     |    |
| Filtration and transfer at waterworks                  | ●   | ●  |
| Distribution from waterworks                           | ●   | ●  |
| Pressure boosting in mains                             | ●   | ●  |
| Pressure boosting in high-rise buildings, hotels, etc. | ●   | ●  |
| Pressure boosting for industrial water supply          | ●   | ●  |
| <b>Industry</b>                                        |     |    |
| <b>Pressure boosting</b>                               |     |    |
| Process water systems                                  | ●   | ●  |
| Washing and cleaning systems                           | ●   | ●  |
| Vehicle washing tunnels                                | ●   | ●  |
| Fire fighting systems                                  | ●   | ●  |
| <b>Liquid transfer</b>                                 |     |    |
| Cooling and air-conditioning systems (refrigerants)    | ●   | ●  |
| Boiler feed and condensate systems                     | ●   | ●  |
| Machine tools (cooling lubricants)                     | ●   | ●  |
| Aquafarming                                            | ●   | ●  |
| <b>Transfer</b>                                        |     |    |
| Oil and alcohol                                        | ●   | ●  |
| Glycol and coolants                                    | ●   | ●  |
| <b>Water treatment</b>                                 |     |    |
| Ultra-filtration systems                               | ●   | ○  |
| Reverse osmosis systems                                | ●   | ○  |
| Softening, ionising, demineralizing systems            | ●   | ○  |
| Distillation systems                                   | ●   | ○  |
| Separators                                             | ●   | ○  |
| Swimming baths                                         | ●   | ●  |
| <b>Irrigation</b>                                      |     |    |
| Field irrigation (flooding)                            | ●   | ●  |
| Sprinkler irrigation                                   | ●   | ●  |
| Drip-feed irrigation                                   | ●   | ●  |

- Recommended pump model
- Option pump model

# Product introduction

Vertical Multistage Centrifugal Pump

## Product range

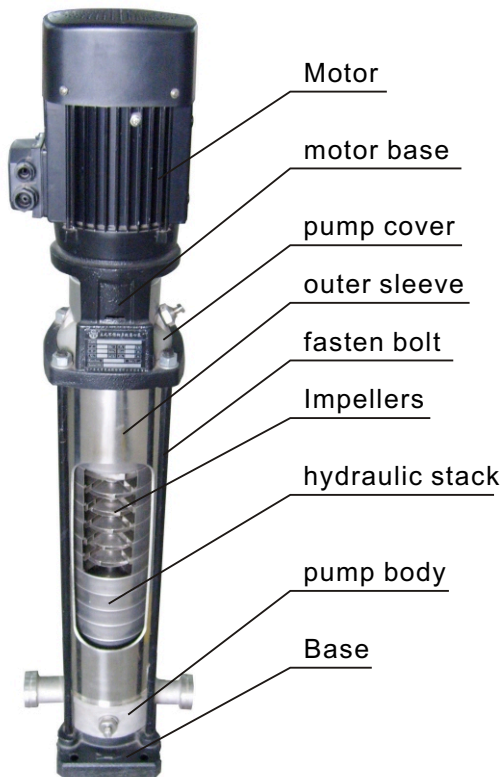
| Range                                     | RV1<br>RVA1                            | RV2<br>RVA2                            | RV3<br>RVA3                            | RV4<br>RVA4                            | RV5<br>RVA5                            | RV10<br>RVA10                        | RV15<br>RVA15                  | RV20<br>RVA20                  | RV32<br>RVA32 | RV45<br>RVA45 | RV64<br>RVA64 | RV90<br>RVA90 |
|-------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------|--------------------------------|---------------|---------------|---------------|---------------|
| Nominal rated [m <sup>3</sup> /h]         | 1                                      | 2                                      | 3                                      | 4                                      | 5                                      | 10                                   | 15                             | 20                             | 32            | 45            | 64            | 90            |
| Temperature range [°C]                    | -20~+104                               |                                        |                                        |                                        |                                        |                                      |                                |                                |               |               |               |               |
| Temperature on range [°C]                 | -40~+180                               |                                        |                                        |                                        |                                        |                                      |                                |                                |               | -40~+180      |               |               |
| Max Efficiency [%]                        | 44                                     | 45                                     | 56                                     | 58                                     | 65                                     | 66                                   | 68                             | 69                             | 77            | 78            | 80            | 81            |
| RV pump                                   |                                        |                                        |                                        |                                        |                                        |                                      |                                |                                |               |               |               |               |
| Flow range [m <sup>3</sup> /h]            | 0.7-2.4                                | 1-3.2                                  | 1.2-4.5                                | 2-4.8                                  | 2.5-8                                  | 5-13                                 | 9-24                           | 10-29                          | 14-40         | 20-56         | 30-85         | 40-120        |
| Max Pressure [bar]                        | 22                                     | 25                                     | 24                                     | 25                                     | 24                                     | 22                                   | 23                             | 25                             | 28            | 26            | 20            | 20            |
| High Pressure on request [bar]            | 47                                     | 47                                     | 47                                     | 47                                     | 47                                     | 47                                   | 47                             | 47                             | 39            | 40            | 39            | 39            |
| Motor power [kW]                          | 0.37-2.2                               | 0.37-3                                 | 0.37-3                                 | 0.37-4                                 | 0.37-5.5                               | 0.37-7.5                             | 1.1-15                         | 1.1-18.5                       | 1.5-30        | 3-45          | 4-45          | 5.5-45        |
| Material type                             |                                        |                                        |                                        |                                        |                                        |                                      |                                |                                |               |               |               |               |
| RV<br>cast iron, S.S<br>EN1.4301/AISI 304 | ●                                      | ●                                      | ●                                      | ●                                      | ●                                      | ●                                    | ●                              | ●                              | ●             | ●             | ●             | ●             |
| RVA<br>S.S<br>EN1.4301/AISI 304           | ●                                      | ●                                      | ●                                      | ●                                      | ●                                      | ●                                    | ●                              | ●                              | ●             | ●             | ●             | ●             |
| RVN<br>S.S<br>EN1.4401/AISI 316           | ●                                      | ●                                      | ●                                      | ●                                      | ●                                      | ●                                    | ●                              | ●                              | ●             | ●             | ●             | ●             |
| RV pump pipe connection                   |                                        |                                        |                                        |                                        |                                        |                                      |                                |                                |               |               |               |               |
| Flange                                    | DN25<br>DN32                           | DN25<br>DN32                           | DN25<br>DN32                           | DN25<br>DN32                           | DN25<br>DN32                           | DN40                                 | DN50                           | DN50                           | DN65          | DN80          | DN100         | DN100         |
| Flange on request                         | —                                      | —                                      | —                                      | —                                      | —                                      | DN50                                 | DN65                           | DN65                           | DN80          | DN100         | DN125         | DN125         |
| RVA/RV pump pipe connection               |                                        |                                        |                                        |                                        |                                        |                                      |                                |                                |               |               |               |               |
| column pipe thread★                       | G1<br>G1 <sup>1</sup> / <sub>4</sub>   | G1<br>G1 <sup>1</sup> / <sub>4</sub>   | G1<br>G1 <sup>1</sup> / <sub>4</sub>   | G1<br>G1 <sup>1</sup> / <sub>4</sub>   | G1<br>G1 <sup>1</sup> / <sub>4</sub>   | G1 <sup>1</sup> / <sub>2</sub><br>G2 | G2 <sup>1</sup> / <sub>2</sub> | G2 <sup>1</sup> / <sub>2</sub> | —             | —             | —             | —             |
| column pipe thread on request★            | G1 <sup>1</sup> / <sub>2</sub>         | G1 <sup>1</sup> / <sub>2</sub>         | G1 <sup>1</sup> / <sub>2</sub>         | G1 <sup>1</sup> / <sub>2</sub>         | G1 <sup>1</sup> / <sub>2</sub>         | —                                    | G2                             | G2                             | —             | —             | —             | —             |
| Flange                                    | DN25<br>DN32                           | DN25<br>DN32                           | DN25<br>DN32                           | DN25<br>DN32                           | DN25<br>DN32                           | DN40                                 | DN50                           | DN50                           | DN65          | DN80          | DN100         | DN100         |
| Flange on request                         | —                                      | —                                      | —                                      | —                                      | —                                      | DN50                                 | DN65                           | DN65                           | DN80          | DN100         | DN125         | DN125         |
| Cutting ferrule joint [PJE] ★             | G1 <sup>1</sup> / <sub>4</sub><br>DN32 | G1 <sup>1</sup> / <sub>4</sub><br>DN32 | G1 <sup>1</sup> / <sub>4</sub><br>DN32 | G1 <sup>1</sup> / <sub>4</sub><br>DN32 | G1 <sup>1</sup> / <sub>4</sub><br>DN32 | G2<br>DN50                           | G2<br>DN50                     | G2<br>DN50                     | —             | —             | —             | —             |

★NPT thread are on request

## Pump

RVA and RV are non-self priming vertical multistage centrifugal pump, the pumps are available with standard motor, the inlet and outlet are located at the pump bottom at the same plane (inline type). All pumps are equipped with a maintenance-free mechanical seal set of the cartridge type.

**Fig.1 RVA**



## Motor

RVA and RV are fitted with a totally enclosed, fan-cooled, 2-pole, three-phase standard motor. From 0.37kW to 2.2kW, are also available with single-phase motor. (1\*220-230V/240V).

## Motor Protection

Single-phase motor have a built-in thermal overload switch. Three-phase motors must be connected to a motor protective circuit breaker according to local regulations.

## Ambient temperature

Ambient temperature: maximum +40°C, if the ambient temperature exceeds +40°C, or the pump is installed at an altitude exceeding 1000 meters, the motor must not be fully loaded due to the risk of overheating. Overheating may result from excessive ambient temperatures or the low density and consequently low cooling effect of the air. In such cases, it may be necessary to use a motor with a higher rated output.

## Terminal box positions

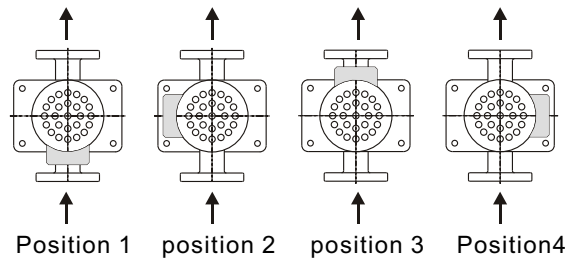
As standard the terminal box is mounted on the suction side of the pump, meanwhile, 0°, 90°, 180°, 270° could be adjusted according to the following proceeding:

1. If necessary, disassembling the protective cover of the shaft connector, but did not disassembling the shaft connector.
2. Disassembling the motor fixation screws.
3. Turn the motor to the required direction.
4. Fasten the motor screws.
5. Install the shaft connector's protective cover.

The voltage and frequency are marked on the label, the correct power should be confirm with the label before usage.

To ensure the electric connection is conformity to the drawing marked on the label inside the terminal box.

**Fig2. Terminal box positions**

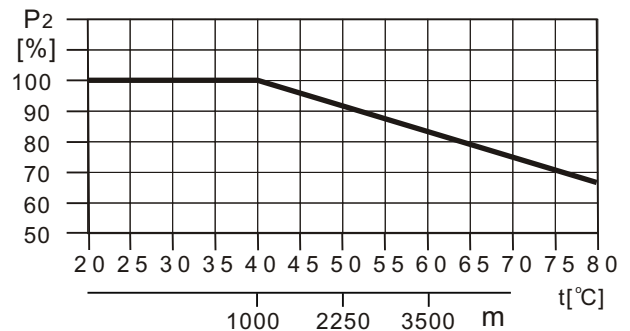


## Viscosity

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in the power consumption.

In such situations the pump should be fitted with a larger motor, if in doubt.

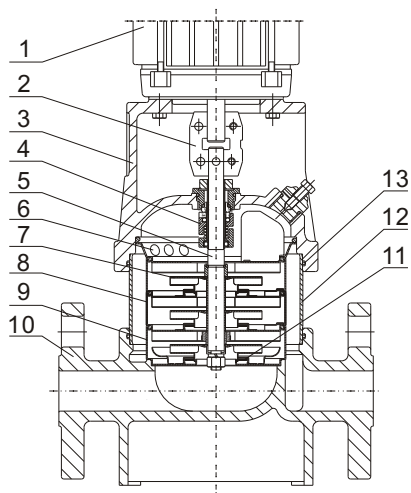
**Fig.3 Relationship between motor output (P2) and temperature**



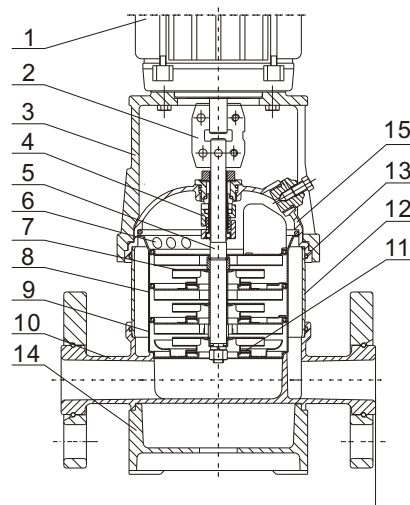
## Example:

From the Fig.3, the pump is installed at an altitude exceeding 3500 meters, P2 will decrease to 88%, if the ambient temperature is up to 70°C, P2 will decrease to 78%.

**RV1,2,3,4,5**  
**Sectional drawing**



**RVA1,2,3,4,5**  
**Sectional drawing**



**Material RV**

| No. | Description     | Material | EN/DIN    | AISI/ASTM |
|-----|-----------------|----------|-----------|-----------|
| 1   | Motor           |          |           |           |
| 2   | Shaft connector |          |           |           |
| 3   | Pump head       | Castiron | EN-JL1030 | ASTM25B   |
| 4   | Mechanical seal |          |           |           |
| 5   | Shaft           | S.S      |           | AISI420   |
| 6   | Outlet          | S.S      | 1.4301    | AISI304   |
| 7   | Impeller        | S.S      | 1.4301    | AISI304   |
| 8   | Hydraulic stack | S.S      | 1.4301    | AISI304   |
| 9   | Inlet           | S.S      | 1.4301    | AISI304   |
| 10  | Pump body       | Castiron | EN-JL1030 | ASTM25B   |
| 11  | Neck ring       | PTFE     |           |           |
| 12  | Outer sleeve    | S.S      | 1.4301    | AISI304   |
| 13  | O-ring          | EPDM/FKM |           |           |
|     |                 |          |           |           |
|     |                 |          |           |           |

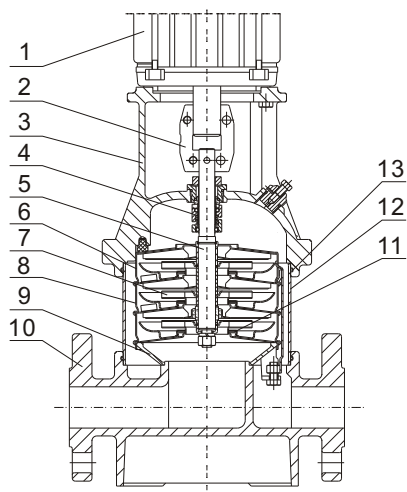
**Material RVA**

| No. | Description     | Material | EN/DIN    | AISI/ASTM |
|-----|-----------------|----------|-----------|-----------|
| 1   | Motor           |          |           |           |
| 2   | Shaft connector |          |           |           |
| 3   | Pump head       | Castiron | EN-JL1030 | ASTM25B   |
| 4   | Mechanical seal |          |           |           |
| 5   | Shaft           | S.S      | 1.4057    | AISI431   |
| 6   | Outlet          | S.S      | 1.4301    | AISI304   |
| 7   | Impeller        | S.S      | 1.4301    | AISI304   |
| 8   | Hydraulic stack | S.S      | 1.4301    | AISI304   |
| 9   | Inlet           | S.S      | 1.4301    | AISI304   |
| 10  | Pump body       | S.S      | 1.4301    | AISI304   |
| 11  | Neck ring       | PTFE     |           |           |
| 12  | Outer sleeve    | S.S      | 1.4301    | AISI304   |
| 13  | O-ring          | EDM/FKM  |           |           |
| 14  | Bottom base     | Castiron | EN-JL1030 | ASTM25B   |
| 15  | Pump cover      | S.S      | 1.4301    | AISI304   |



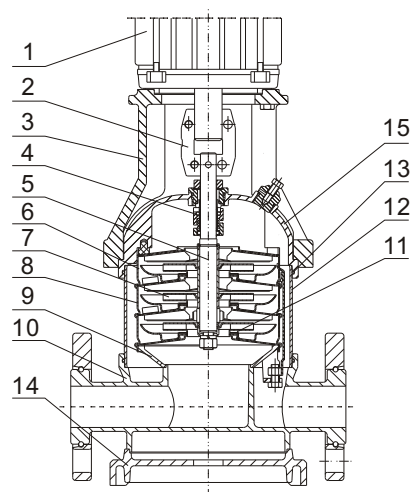
RV10,15,20

**Sectional drawing**



RVA10,15,20

**Sectional drawing**



**Material RV**

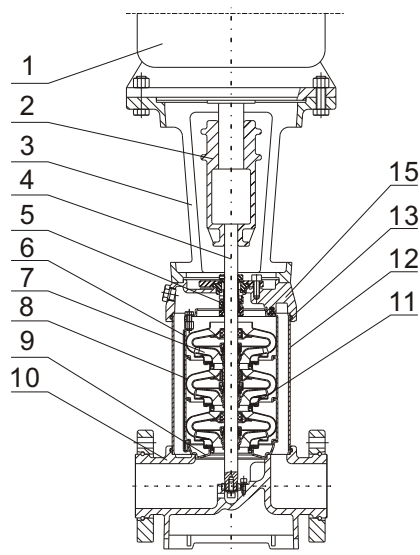
| No. | Description     | Material  | EN/DIN    | AISI/ASTM |
|-----|-----------------|-----------|-----------|-----------|
| 1   | Motor           |           |           |           |
| 2   | Shaft connector |           |           |           |
| 3   | Pump head       | Cast iron | EN-JL1030 | ASTM25B   |
| 4   | Mechanical seal |           |           |           |
| 5   | Shaft           | S.S       |           | AISI420   |
| 6   | Outlet          | S.S       | 1.4301    | AISI304   |
| 7   | Impeller        | S.S       | 1.4301    | AISI304   |
| 8   | Hydraulic stack | S.S       | 1.4301    | AISI304   |
| 9   | Settled cover   | S.S       | 1.4301    | AISI304   |
| 10  | Pump body       | Cast iron | EN-JL1030 | ASTM25B   |
| 11  | Neck ring       | PTFE      |           |           |
| 12  | Outer sleeve    | S.S       | 1.4301    | AISI304   |
| 13  | O-ring          | EPDM/FKM  |           |           |
|     |                 |           |           |           |
|     |                 |           |           |           |

**Material RVA**

| No. | Description     | Material  | EN/DIN    | AISI/ASTM |
|-----|-----------------|-----------|-----------|-----------|
| 1   | Motor           |           |           |           |
| 2   | Shaft connector |           |           |           |
| 3   | Pump head       | Cast iron | EN-JL1030 | ASTM25B   |
| 4   | Mechanical seal |           |           |           |
| 5   | Shaft           | S.S       | 1.4057    | AISI431   |
| 6   | Outlet          | S.S       | 1.4301    | AISI304   |
| 7   | Impeller        | S.S       | 1.4301    | AISI304   |
| 8   | Hydraulic stack | S.S       | 1.4301    | AISI304   |
| 9   | Settled cover   | S.S       | 1.4301    | AISI304   |
| 10  | Pump body       | S.S       | 1.4301    | AISI304   |
| 11  | Neck ring       | PTFE      |           |           |
| 12  | Outer sleeve    | S.S       | 1.4301    | AISI304   |
| 13  | O-ring          | EPDM/FKM  |           |           |
| 14  | Bottom base     | Cast iron | EN-JL1030 | ASTM25B   |
| 15  | Pump cover      | S.S       | 1.4301    | AISI304   |

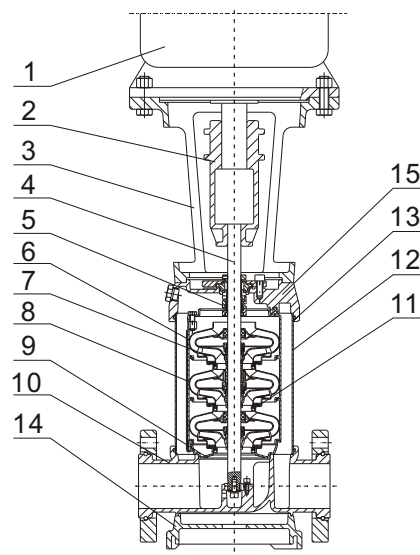
RV32,45,64,90

### Sectional drawing



RVA32,45,64,90

### Sectional drawing



### Material RV

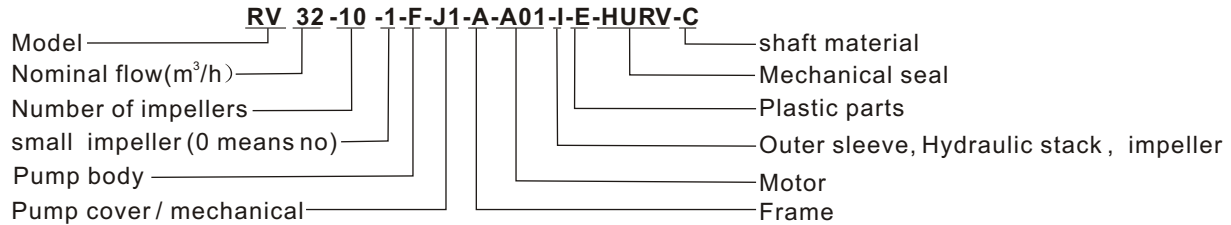
| No. | Description     | Material  | EN/DIN    | AISI/ASTM |
|-----|-----------------|-----------|-----------|-----------|
| 1   | Motor           |           |           |           |
| 2   | Shaft connector |           |           |           |
| 3   | Pump head       | Cast iron | EN-JL1030 | ASTM25B   |
| 4   | Shaft           | S.S       |           | AISI420   |
| 5   | Mechanical sea  |           |           |           |
| 6   | Outlet          | S.S       | 1.4301    | AISI304   |
| 7   | Impeller        | S.S       | 1.4301    | AISI304   |
| 8   | Hydraulic stack | S.S       | 1.4301    | AISI304   |
| 9   | Inlet           | S.S       | 1.4301    | AISI304   |
| 10  | Pump body       | Cast iron | EN-JL1030 | ASTM25B   |
| 11  | Neck ring       | PTFE      |           |           |
| 12  | Outer sleeve    | S.S       | 1.4301    | AISI304   |
| 13  | O-ring          | EPDM/FKM  |           |           |
| 14  | Pump cover      | Cast iron | EN-JL1030 | ASTM25B   |
|     |                 |           |           |           |

### Material RVA

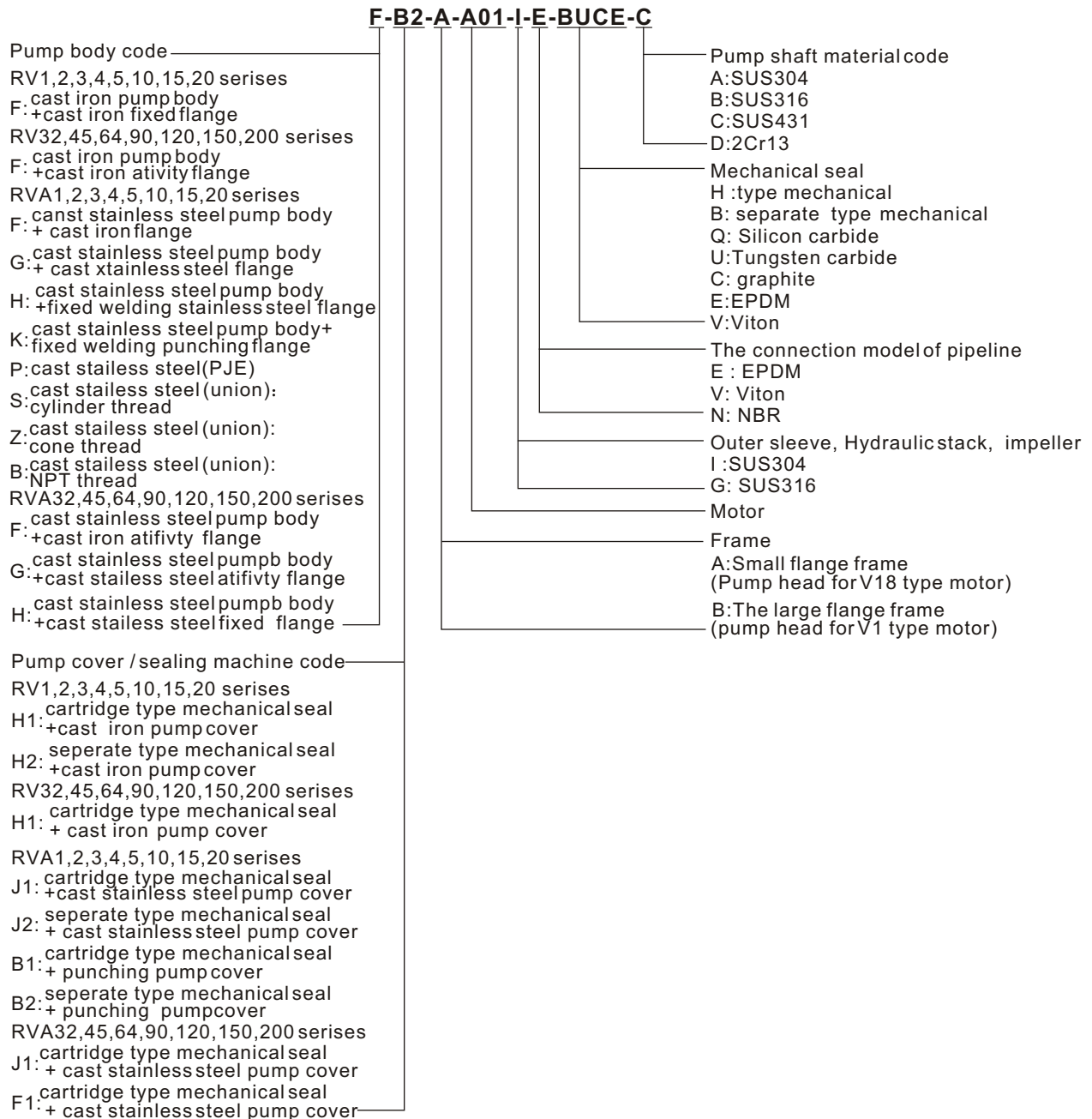
| No. | Description     | Material  | EN/DIN    | AISI/ASTM |
|-----|-----------------|-----------|-----------|-----------|
| 1   | Motor           |           |           |           |
| 2   | Shaft connector |           |           |           |
| 3   | Pump head       | Cast iron | EN-JL1030 | ASTM25B   |
| 4   | Shaft           | S.S       | 1.4057    | AISI431   |
| 5   | Mechanical seal |           |           |           |
| 6   | Outlet          | S.S       | 1.4301    | AISI304   |
| 7   | Impeller        | S.S       | 1.4301    | AISI304   |
| 8   | Hydraulic stack | S.S       | 1.4301    | AISI304   |
| 9   | Inlet           | S.S       | 1.4301    | AISI304   |
| 10  | Pump body       | S.S       | 1.4301    | AISI304   |
| 11  | Neck ring       | PTFE      |           |           |
| 12  | Outer sleeve    | S.S       | 1.4301    | AISI304   |
| 13  | O-ring          | EPDM/FKM  |           |           |
| 14  | Bottom base     | Cast iron | EN-JL1030 | ASTM25B   |
| 15  | Pump cover      | S.S       | 1.4301    | AISI304   |

## Model instruction

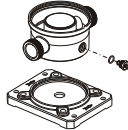
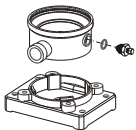
RV/RVA1,2,3,4,5,10,15 and 20... ..



## Codes



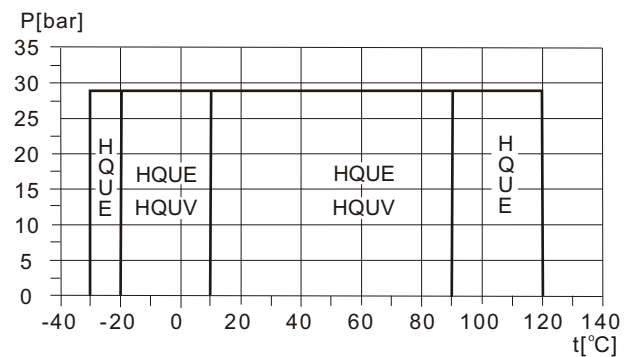
## Maximum operating pressure and temperature range

|                            | DIN-FGJ                                                                           | UNION                                                                              | PJE                                                                                 |
|----------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                            |  |  |  |
|                            | Max. permissible operating pressure                                               |                                                                                    | Liquid temperature range                                                            |
| RV,RVA1                    | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA2                    | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA3                    | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA4                    | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA5                    | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA10-1→RV,RVA10-10     | 16bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA10-12→RV,RVA10-17    | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA15-1→RV,RVA15-8      | 16bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA15-9→RV,RVA15-12     | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA20-1→RV,RVA20-7      | 16bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA20-8→RV,RVA20-10     | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA32-1-1→RV,RVA32-5    | 16bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA32-6-2→RV,RVA32-8    | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA32-9-2→RV,RVA32-10-2 | 30bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA45-1-1→RV,RVA45-4    | 16bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA45-5-2→RV,RVA45-6-1  | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA45-6→RV,RVA45-7      | 30bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA64-1-1→RV,RVA64-3    | 16bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA64-4-2→RV,RVA64-5-2  | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA90-1-1→RV,RVA90-3    | 16bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |
| RV,RVA90-4-2               | 25bar                                                                             |                                                                                    | -20 °C to +104 °C                                                                   |

## Operating range of the shaft seal

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The range shown in fig 4. Applies to cleanwater and water with glycol liquids.

Fig.4 Operating range of standard shaft seals





## maximum inlet pressure

The following table shows the maximum permissible inlet pressure. However, the actual inlet pressure the pressure against a closed valve must always be lower than the maximum permissible operating pressure. If the maximum permissible operating pressure is exceeded, the bearing in the motor may be damaged and the life of the shaft seal reduced.

|                              |  |       |
|------------------------------|--|-------|
| <b>RV,RVA 1</b>              |  |       |
| RV,RVA1-2 → RV,RVA1-25       |  | 10bar |
| RV,RVA1-27                   |  | 15bar |
| <b>RV,RVA 2</b>              |  |       |
| RV,RVA2-2 → RV,RVA2-26       |  | 10bar |
| <b>RV,RVA 3</b>              |  |       |
| RV,RVA3-2 → RV,RVA3-15       |  | 10bar |
| RV,RVA3-17 → RV,RVA3-25      |  | 15bar |
| <b>RV,RVA 4</b>              |  |       |
| RV,RVA4-2 → RV,RVA4-22       |  | 15bar |
| <b>RV,RVA 5</b>              |  |       |
| RV,RVA5-2 → RV,RVA5-9        |  | 10bar |
| RV,RVA5-10 → RV,RVA5-24      |  | 15bar |
| <b>RV,RVA 10</b>             |  |       |
| RV,RVA10-1 → RV,RVA10-5      |  | 8bar  |
| RV,RVA10-6 → RV,RVA10-17     |  | 10bar |
| <b>RV,RVA 15</b>             |  |       |
| RV,RVA 15-1 → RV,RVA 15-2    |  | 8bar  |
| RV,RVA 15-3 → RV,RVA 15-12   |  | 10bar |
| <b>RV,RVA20</b>              |  |       |
| RV,RVA20-1                   |  | 8bar  |
| RV,RVA20-2 → RV,RVA20-10     |  | 10bar |
| <b>RV,RVA 32</b>             |  |       |
| RV,RVA32-1-1 → RV,RVA32-2    |  | 4bar  |
| RV,RVA32-3-2 → RV,RVA32-6    |  | 10bar |
| RV,RVA32-7-2 → RV,RVA32-10-2 |  | 15bar |
| <b>RV,RVA 45</b>             |  |       |
| RV,RVA45-1-1 → RV,RVA45-1    |  | 4bar  |
| RV,RVA45-2-2 → RV,RVA45-3    |  | 10bar |
| RV,RVA45-4-2 → RV,RVA45-7    |  | 15bar |
| <b>RV,RVA 64</b>             |  |       |
| RV,RVA64-1-1                 |  | 4bar  |
| RV,RVA64-1 → RV,RVA64-2-1    |  | 10bar |
| RV,RVA64-2 → RV,RVA64-5-2    |  | 15bar |
| <b>RV,RVA 90</b>             |  |       |
| RV,RVA90-1-1 → RV,RVA90-2-2  |  | 10bar |
| RV,RVA90-2-1 → RV,RVA90-4-2  |  | 15bar |

## Example of operating and inlet pressures :

The values for operating and inlet pressures shown in the table must not be considered individually but must always be compared, see the following examples.

### Example 1:

pump model: RVA-5-20-A-FGJ-E-HQUE

Max. operating pressure: 25bar

Max. inlet pressure: 15bar

discharge pressure against a closed valve: 13.7bar, see page 31.

the pump is not allowed to start at an inlet pressure of 15 bar, but at an inlet pressure of  $25 - 13.7 = 11.3$  bar.

### Example 2:

MODEL: RVA15-3-A-P-E-HQUE

Max. operating pressure: 16bar

Max. inlet pressure: 8bar

discharge pressure against a closed valve: 4.2bar, see page 39 curves chart.

This pump is allowed to start at an inlet pressure of 6bar, as the discharge pressure against a closed valve is only 4.2bar, which results in an operating pressure of  $6 + 4.2 = 10.2$  bar. On the contrary, the max. Operating pressure of this pump limited to 12.2bar, as a higher operating pressure bigger than 8bar will require on the Inlet.

## selection of pumps

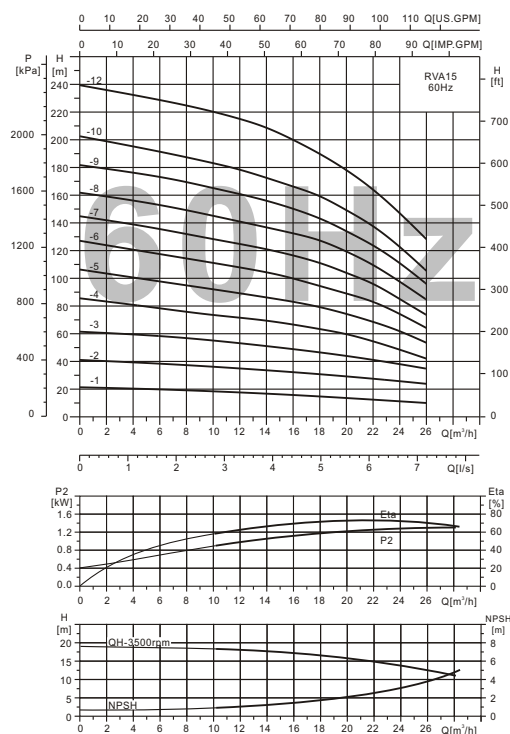
selection of pumps should be based on:

- the duty point of the pump(see page12).
- dimensional data such as pressure loss as a
- result of height differences,friction loss in the pipework,pump efficiency etc.(see page12).
- pump materials(see page6,7,8)
- pump connections(see page13)
- shaft seal(see page13)

### 1. Duty point of the pump

From a duty point it is possible to select a pump on the basis of the curve charts shown in "performance curves/technical" data.

Fig.5 example of curve chart



### 2. dimensional data

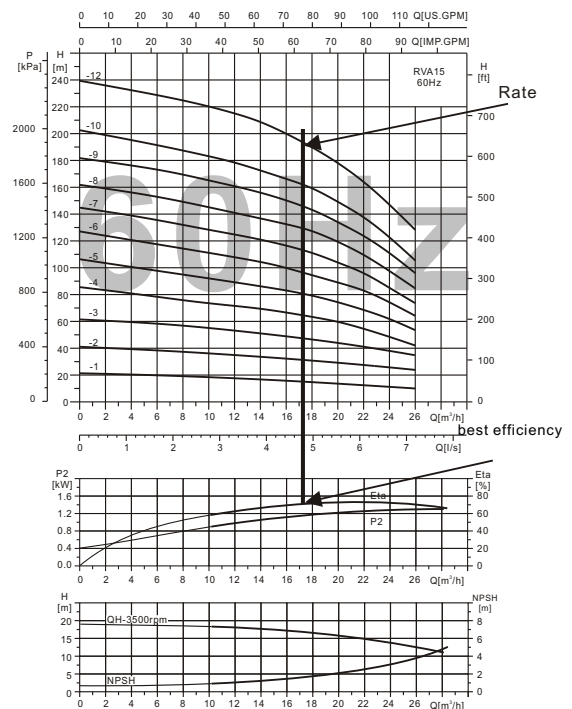
When sizing a pump the following must be taken into accounting:

- Required flow and pressure at the draw-off point.
- Pressure loss as a result of height differences( $H_{geo}$ ).
- Friction loss in the pipework( $H_f$ ) It may.
- Best efficiency at the estimated duty point.
- NPSH value.
- For calculation of the NPSH value, see corresponding curves chart.

### pump efficiency

Before determining the best efficiency point, the operation pattern of the pump needs to be identified. If the pump expected to operate as the same duty point, then select a RVA pump which is operating at a duty point corresponding with the best efficiency of the pump.

Fig.6 example of duty point



As the pump is sized on the basis of the highest possible flow, it is important always to have the duty point to the right on the efficiency curve(eta) in order to keep efficiency high when the flow drops.

Fig.7 best efficiency

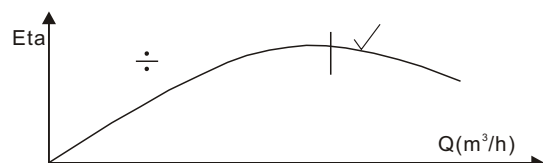
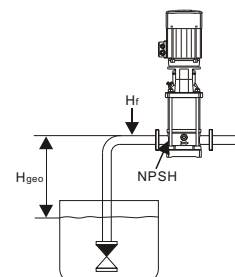


Fig.8 dimensional data



## 3. pump material

The material variant(RV,RVA)should be selected based of the liquid to be pump.

RVA wetted parts are made of AISI304.

RV pump body is made of cast-iron and .

Wetted parts are made of AISI304.

## 4. Pump connections

selection of pump connection depend on the rated pressure and pipework. To meet any requirement the RV, RVA pump offer a wide range of flexible connection such as:

- DIN frange.
- PJE coupling.
- union connection.
- Other connections on request.

## 5.shaft seal

As standard, the RV AND RVA range is fitted with a cartridge type suitable for themost common applications. The following key parameters must be taken into account ,when selecting the shaft seal:

- type of pumped liquid.
- liquid temperature and
- maximum pressure.

## Inlet pressure and operating pressure

The limit values stated on page 10 and page 11 must not be exceeded as regards

- maximum inlet pressure and
- maximum operating pressure.

Fig. 9 RV pump

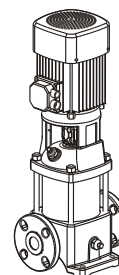
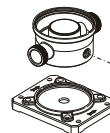


Fig. 10 pump connections

DIN-FGJ



UNION



PJE

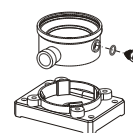


Fig.11 Shaft seal (cartridge type)

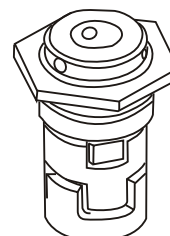
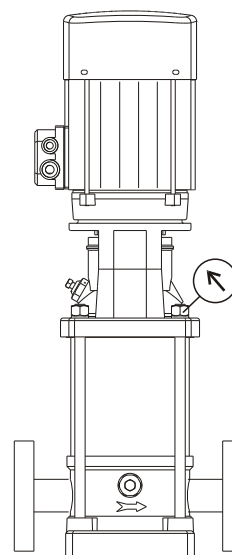


Fig.12 Inlet pressure and operating pressure



## Minimum inlet pressure-NPSH

Calculation of the inlet pressure "H" is recommended in these situations :

- the liquid temperature is high.
  - the flow is significantly higher than the rated flow.
  - water is drawn from depths.
  - water is drawn through long pipes.
- inlet conditions are poor. to avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump.

The maximum suction lift "H" in metres head can be calculated as follows:

$$H = P_b * 10.2 - \text{NPSH} - H_f - H_v - H_s$$

$P_b$  = Barometric pressure in bar.  
(Barometric pressure can be set to 1 bar).  
in closed systems,  $P_b$  indicates the system pressure in bar.

NPSH = Net positive suction Head in metres head.  
(To be read from the NPSH curve at the highest flow the pump will be delivering).

$H_f$  = Friction loss in suction pipe(unit:m).  
(At the highest flow the pump will be delivering.)

$H_v$  = Vapour pressure (unit:m).  
(To be read from the vapour pressure scale).

$H_s$  = safety margin=minimum 0.5 metres head.

If the "H" calculated is positive, the pump can operate at a suction lift of maximum "H" metres head. If the "H" calculated is negative, an inlet pressure of minimum "H" metres head is required.

Example:

$P_b = 1 \text{ bar}$

pump model: RVA10,50Hz

flow:  $10 \text{ m}^3/\text{h}$

NPSH(P36 reference: 2.1 metres head.

liquid temperature:  $+50^\circ\text{C}$

$H_v$ (reference picture4): 1.3 metres head.

$H = P_b * 10.2 - \text{NPSH} - H_f - H_v - H_s$

$H = 1 * 10.2 - 2.1 - 3.0 - 1.3 - 0.5 = 3.3 \text{ (metres)}$

It means the pump can operate at a suction lift of maximum 3.3 metres head.

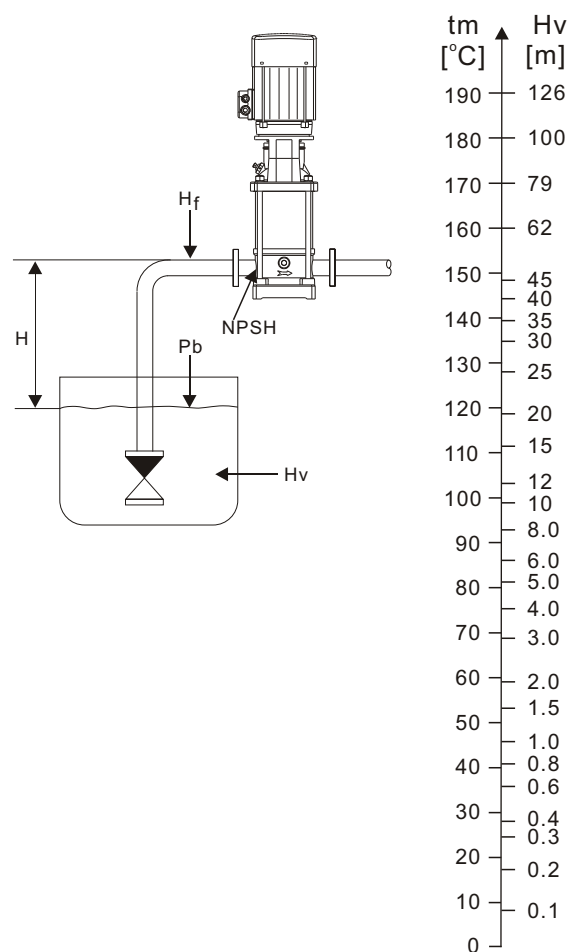
exchanged meter head to bar:

1 metre head =  $1 * 0.0981 = 0.0981 \text{ bar}$

exchanged metre head to kpa:

1 metre head =  $1 * 9.81 = 9.81 \text{ kpa}$ .

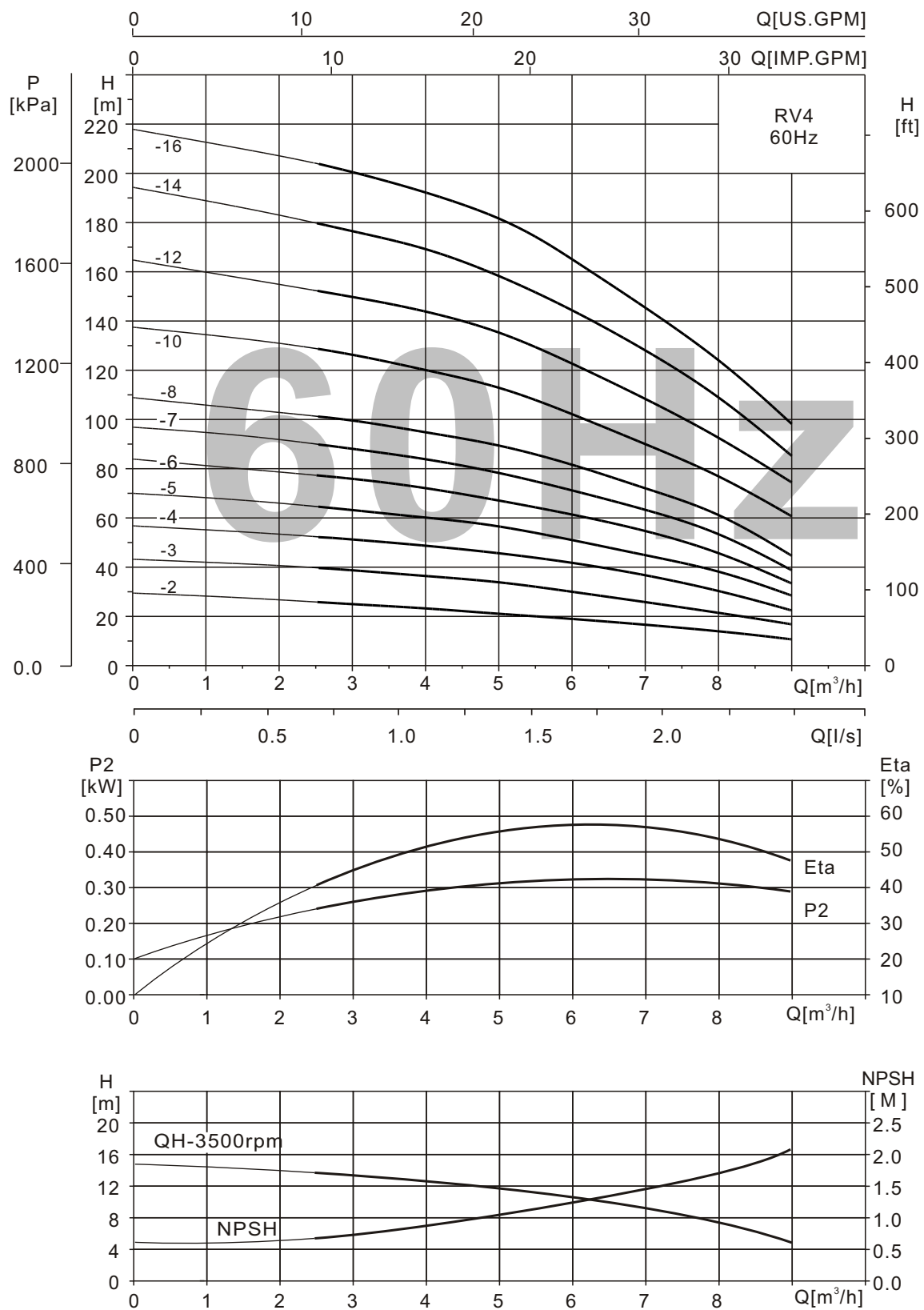
Fig.13 Minimum inlet pressure-NPSH





# Performance Curve

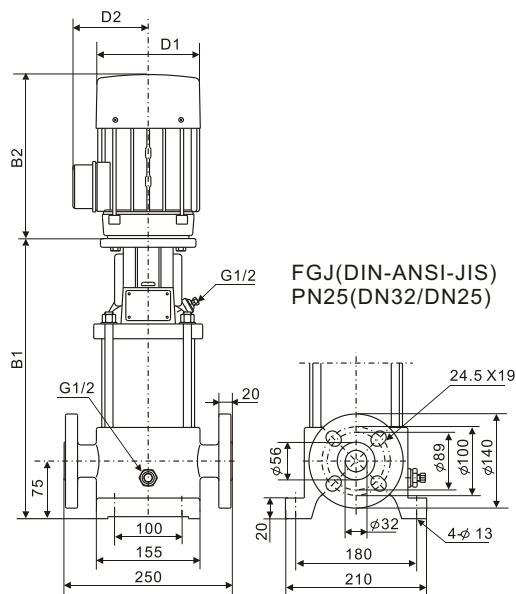
RV4-60Hz



## Performance Table

| Model         | Power<br>P <sub>2</sub> (kW) | Q<br>(m <sup>3</sup> /h) | 2.5 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 |
|---------------|------------------------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| RV4-2         | 0.75                         | H<br>(m)                 | 26  | 25  | 23  | 21  | 19  | 16  | 14  | 11  |
| RV4-3         | 1.1                          |                          | 39  | 38  | 36  | 32  | 28  | 24  | 21  | 18  |
| RV4-4         | 1.5                          |                          | 52  | 50  | 48  | 44  | 38  | 35  | 31  | 22  |
| RV4-5         | 2.2                          |                          | 65  | 62  | 60  | 55  | 49  | 44  | 39  | 27  |
| RV4-6         | 2.2                          |                          | 78  | 75  | 72  | 67  | 59  | 54  | 47  | 33  |
| RV4-7         | 3.0                          |                          | 92  | 88  | 84  | 78  | 69  | 62  | 55  | 38  |
| RV4-8         | 3.0                          |                          | 104 | 100 | 95  | 90  | 79  | 72  | 63  | 44  |
| RV4-10        | 4.0                          |                          | 130 | 125 | 120 | 113 | 102 | 90  | 80  | 61  |
| RV4-12        | 4.0                          |                          | 156 | 150 | 145 | 136 | 122 | 109 | 96  | 74  |
| <b>RV4-14</b> | 5.5                          |                          | 182 | 176 | 170 | 159 | 145 | 129 | 112 | 86  |
| RV4-16        | 5.5                          |                          | 207 | 201 | 196 | 183 | 165 | 146 | 128 | 98  |
|               |                              |                          |     |     |     |     |     |     |     |     |
|               |                              |                          |     |     |     |     |     |     |     |     |
|               |                              |                          |     |     |     |     |     |     |     |     |
|               |                              |                          |     |     |     |     |     |     |     |     |
|               |                              |                          |     |     |     |     |     |     |     |     |

## Installation sketches



## Dimensions and weights

| Model  | Dimensions(mm) |         |       |     |     |     | Weight<br>(kg) |
|--------|----------------|---------|-------|-----|-----|-----|----------------|
|        | B1             | B2      | B1+B2 | D   | D1  | D2  |                |
| RV4-2  | 262            | 205     | 467   | -   | 133 | 102 | 25             |
| RV4-3  | 286            | 241     | 527   | -   | 154 | 111 | 28             |
| RV4-4  | 304            | 241/293 | 545   | -   | 151 | 111 | 30             |
| RV4-5  | 330            | 275/293 | 605   | -   | 177 | 116 | 38             |
| RV4-6  | 348            | 275/293 | 623   | -   | 177 | 116 | 39             |
| RV4-7  | 366            | 293     | 641   | -   | 177 | 116 | 43             |
| RV4-8  | 384            | 293     | 659   | -   | 177 | 116 | 44             |
| RV4-10 | 440            | 305     | 745   | -   | 197 | 148 | 45             |
| RV4-12 | 476            | 305     | 781   | -   | 197 | 148 | 46             |
| RV4-14 | 517            | 390     | 907   | 300 | 275 | 210 | 74             |
| RV4-16 | 553            | 390     | 943   | 300 | 275 | 210 | 75             |
|        |                |         |       |     |     |     |                |
|        |                |         |       |     |     |     |                |
|        |                |         |       |     |     |     |                |
|        |                |         |       |     |     |     |                |

# Technical Data

## Standard motor

| Power<br>$P_2$ (kW) | Voltage<br>(V)    | Current<br>$I_N$ (A) | Power factor<br>$\cos \varphi$ | EFFiciency<br>(%) | $I_{st}/I_N$ |
|---------------------|-------------------|----------------------|--------------------------------|-------------------|--------------|
| 0.37                | $\Delta$ 220/Y380 | $\Delta$ 1.8/Y1.0    | 0.78                           | 70.0              | 6.2          |
| 0.55                | $\Delta$ 220/Y380 | $\Delta$ 2.5/Y1.5    | 0.81                           | 71.0              | 6.4          |
| 0.75                | $\Delta$ 220/Y380 | $\Delta$ 3.3/Y1.9    | 0.82                           | 72.0              | 6.5          |
| 1.1                 | $\Delta$ 220/Y380 | $\Delta$ 4.6/Y2.7    | 0.82                           | 76.5              | 7.2          |
| 1.5                 | $\Delta$ 220/Y380 | $\Delta$ 6.2/Y3.6    | 0.83                           | 76.8              | 7.3          |
| 2.2                 | $\Delta$ 220/Y380 | $\Delta$ 8.5/Y4.9    | 0.84                           | 81.1              | 7.5          |
| 3.0                 | $\Delta$ 220/Y380 | $\Delta$ 11.5/Y6.7   | 0.84                           | 81.5              | 7.5          |
| 4.0                 | $\Delta$ 380/Y660 | $\Delta$ 8.2/Y4.7    | 0.88                           | 84.2              | 7.5          |
| 5.5                 | $\Delta$ 380/Y660 | $\Delta$ 11.1/Y6.4   | 0.88                           | 85.7              | 8.1          |
| 7.5                 | $\Delta$ 380/Y660 | $\Delta$ 14.9/Y8.6   | 0.88                           | 87.0              | 8.3          |
| 11                  | $\Delta$ 380/Y660 | $\Delta$ 21.2/Y12.2  | 0.89                           | 88.4              | 8.4          |
| 15                  | $\Delta$ 380/Y660 | $\Delta$ 28.6/Y16.5  | 0.89                           | 89.4              | 8.5          |
| 18.5                | $\Delta$ 380/Y660 | $\Delta$ 34.7/Y20.0  | 0.90                           | 90.0              | 8.5          |
| 22                  | $\Delta$ 380/Y660 | $\Delta$ 41.0/Y23.6  | 0.90                           | 90.5              | 8.4          |
| 30                  | $\Delta$ 380/Y660 | $\Delta$ 55.4/Y31.9  | 0.90                           | 91.4              | 7.5          |
| 37                  | $\Delta$ 380/Y660 | $\Delta$ 67.9/Y39.1  | 0.90                           | 92.0              | 7.5          |
| 45                  | $\Delta$ 380/Y660 | $\Delta$ 82.1/Y47.3  | 0.90                           | 92.5              | 7.5          |

## High efficiency motor

| Power<br>$P_2$ (kW) | Voltage<br>(V)    | Current<br>$I_N$ (A) | Power factor<br>$\cos \varphi$ | EFFiciency<br>(%) | $I_{st}/I_N$ |
|---------------------|-------------------|----------------------|--------------------------------|-------------------|--------------|
| 0.75                | $\Delta$ 220/Y380 | $\Delta$ 3.1/Y1.8    | 0.83                           | 77.6              | 6.7          |
| 1.1                 | $\Delta$ 220/Y380 | $\Delta$ 4.2/Y2.4    | 0.83                           | 82.9              | 7.4          |
| 1.5                 | $\Delta$ 220/Y380 | $\Delta$ 5.6/Y3.2    | 0.84                           | 84.2              | 7.7          |
| 2.2                 | $\Delta$ 220/Y380 | $\Delta$ 7.9/Y4.6    | 0.85                           | 85.7              | 7.6          |
| 3.0                 | $\Delta$ 220/Y380 | $\Delta$ 10.4/Y6.0   | 0.87                           | 86.8              | 7.6          |
| 4.0                 | $\Delta$ 380/Y660 | $\Delta$ 7.9/Y4.5    | 0.88                           | 87.7              | 7.6          |
| 5.5                 | $\Delta$ 380/Y660 | $\Delta$ 10.7/Y6.2   | 0.88                           | 88.7              | 7.6          |
| 7.5                 | $\Delta$ 380/Y660 | $\Delta$ 14.5/Y8.3   | 0.88                           | 89.6              | 7.3          |
| 11                  | $\Delta$ 380/Y660 | $\Delta$ 21.0/Y12.1  | 0.88                           | 90.6              | 7.4          |
| 15                  | $\Delta$ 380/Y660 | $\Delta$ 28.3/Y16.3  | 0.88                           | 91.4              | 7.6          |
| 18.5                | $\Delta$ 380/Y660 | $\Delta$ 34.8/Y20.0  | 0.88                           | 91.9              | 7.7          |
| 22                  | $\Delta$ 380/Y660 | $\Delta$ 41.2/Y23.7  | 0.88                           | 92.3              | 7.6          |
| 30                  | $\Delta$ 380/Y660 | $\Delta$ 55.8/Y32.1  | 0.88                           | 92.9              | 7.1          |
| 37                  | $\Delta$ 380/Y660 | $\Delta$ 68.4/Y39.4  | 0.88                           | 93.4              | 7.1          |
| 45                  | $\Delta$ 380/Y660 | $\Delta$ 83.0/Y47.8  | 0.88                           | 93.6              | 7.1          |

Remark: Special motor is available on request.

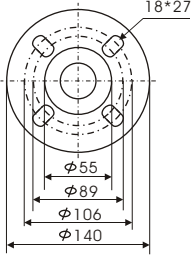
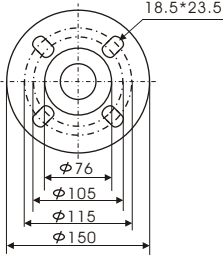
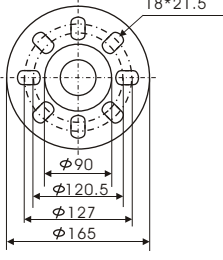
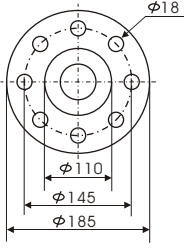
## Pipe connection

Various sets of counter flanges and couplings are available.

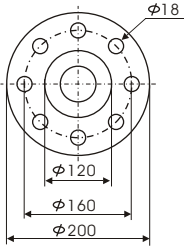
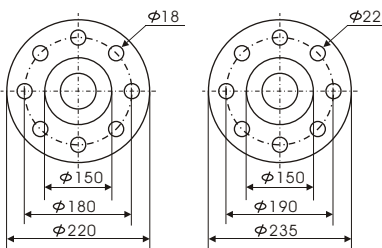
Counter flange for RV series

A set consists of one counter flange, one gasket, bolts and nuts.

(Remarks: The above accessories are not necessary for pumps, there will be extra charge for them if needed)

| counter flange                                                                      | pump type                       | description |                        | rated pressure | pipe work Connection           | product Number |
|-------------------------------------------------------------------------------------|---------------------------------|-------------|------------------------|----------------|--------------------------------|----------------|
|    | RV1<br>RV2<br>RV3<br>RV4<br>RV5 | Threaded    | 16 bar, EN 1092-2      |                | G1                             |                |
|                                                                                     |                                 | For welding | 25 bar, EN 1092-2      |                | 25mm, nominal                  |                |
|                                                                                     |                                 | Threaded    | 16 bar, EN 1092-2      |                | G1 <sup>1</sup> / <sub>4</sub> |                |
|                                                                                     |                                 | For welding | 25 bar, EN 1092-2      |                | 32mm, nominal                  |                |
|   | RV10                            | Threaded    | 16 bar, EN 1092-2      |                | G1 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                 |             | 16 bar, EN 1092-2      |                | G2                             |                |
|                                                                                     |                                 | For welding | 25 bar, EN 1092-2      |                | 40mm, nominal                  |                |
|                                                                                     |                                 | For welding | 40 bar, special flange |                | 50mm, nominal                  |                |
|  | RV15<br>RV20                    | Threaded    | 16 bar, EN 1092-2      |                | G2                             |                |
|                                                                                     |                                 | Threaded    | 16 bar, special flange |                | G2 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                 | Threaded    | 16 bar, special flange |                | G2 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                 | For welding | 25 bar, EN 1092-2      |                | 50mm, nominal                  |                |
|                                                                                     |                                 | For welding | 40 bar, special flange |                | 65mm, nominal                  |                |
|  | RV32                            | Threaded    | 16 bar, EN 1092-2      |                | G2 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                 | Threaded    | 16 bar, special flange |                | G3                             |                |
|                                                                                     |                                 | For welding | 16 bar, EN 1092-2      |                | 65mm, nominal                  |                |
|                                                                                     |                                 | For welding | 40 bar, DIN 2635       |                | 65mm, nominal                  |                |
|                                                                                     |                                 | For welding | 16 bar, special flange |                | 80mm, nominal                  |                |



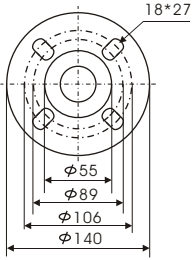
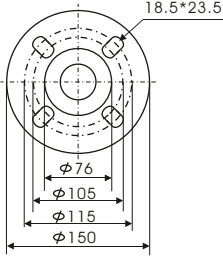
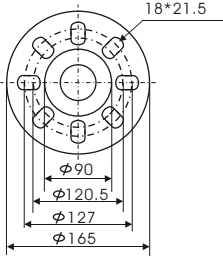
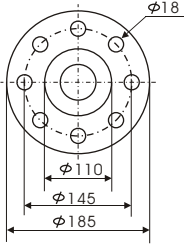
| counter flange                                                                    | pump type    | description | rated pressure | pipe work<br>Connection | product<br>Number |
|-----------------------------------------------------------------------------------|--------------|-------------|----------------|-------------------------|-------------------|
|  | RV45         | Threaded    | 16 bar         | G3                      |                   |
|                                                                                   |              | For welding | 16 bar         | 80mm,nominal            |                   |
|                                                                                   |              | For welding | 40 bar         | 80mm,nominal            |                   |
|  | RV64<br>RV90 | Threaded    | 16 bar         | G4                      |                   |
|                                                                                   |              | For welding | 16 bar         | 100mm,nominal           |                   |
|                                                                                   |              | For welding | 25 bar         | 100mm,nominal           |                   |

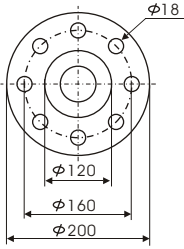
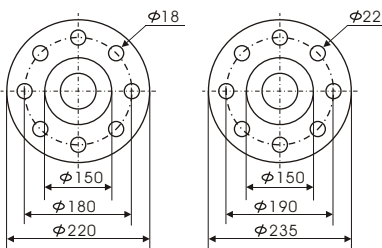
## Counter flange for RVA series

they are made of stainless steel EN1.4403(AISI304)

A set consists of one counter flange, one gasket, bolts and nuts.

(Remarks: The above accessories are not necessary for pumps, there will be extra charge for them if needed)

| counter flange                                                                      | pump type                            | description | rated pressure         | pipe work Connection           | product Number |
|-------------------------------------------------------------------------------------|--------------------------------------|-------------|------------------------|--------------------------------|----------------|
|    | RVA1<br>RVA2<br>RVA3<br>RVA4<br>RVA5 | Threaded    | 16 bar, EN 1092-2      | G1                             |                |
|                                                                                     |                                      | For welding | 25 bar, EN 1092-2      | 25mm, nominal                  |                |
|                                                                                     |                                      | Threaded    | 16 bar, EN 1092-2      | G1 <sup>1</sup> / <sub>4</sub> |                |
|                                                                                     |                                      | For welding | 25 bar, EN 1092-2      | 32mm, nominal                  |                |
|   | RVA10                                | Threaded    | 16 bar, EN 1092-2      | G1 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                      | Threaded    | 16 bar, EN 1092-2      | G2                             |                |
|                                                                                     |                                      | For welding | 25 bar, EN 1092-2      | 40mm, nominal                  |                |
|                                                                                     |                                      | For welding | 25 bar, special flange | 50mm, nominal                  |                |
|  | RVA15<br>RVA20                       | Threaded    | 16 bar, EN 1092-2      | G2                             |                |
|                                                                                     |                                      | Threaded    | 16 bar, special flange | G2 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                      | Threaded    | 16 bar, special flange | G2 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                      | For welding | 25 bar, EN 1092-2      | 50mm, nominal                  |                |
|                                                                                     |                                      | For welding | 25 bar, special flange | 65mm, nominal                  |                |
|  | RVA32                                | Threaded    | 16 bar                 | G2 <sup>1</sup> / <sub>2</sub> |                |
|                                                                                     |                                      | Threaded    | 16 bar, special flange | G3                             |                |
|                                                                                     |                                      | For welding | 16 bar                 | 65mm, nominal                  |                |
|                                                                                     |                                      | For welding | 40 bar                 | 65mm, nominal                  |                |
|                                                                                     |                                      | For welding | 16 bar, special flange | 80mm, nominal                  |                |
|                                                                                     |                                      | For welding | 25 bar, special flange | 80mm, nominal                  |                |

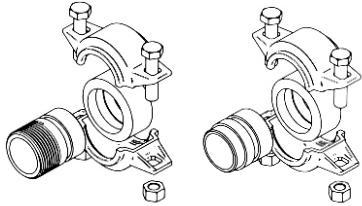
| counter flange                                                                    | pump type      | description | rated pressure | pipe work<br>Connection | product<br>Number |
|-----------------------------------------------------------------------------------|----------------|-------------|----------------|-------------------------|-------------------|
|  | RVA45          | Threaded    | 16 bar         | G3                      |                   |
|                                                                                   |                | For welding | 16 bar         | 80mm,nominal            |                   |
|                                                                                   |                | For welding | 40 bar         | 80mm,nominal            |                   |
|  | RVA64<br>RVA90 | Threaded    | 16 bar         | G4                      |                   |
|                                                                                   |                | For welding | 16 bar         | 100mm,nominal           |                   |
|                                                                                   |                | For welding | 40 bar         | 100mm,nominal           |                   |

## PJE Couplings for RVA series

they are made of stainless steel EN1.4403(AISI304)

A set consists of one clamp, one gasket, bolts and nuts.

(Remarks: The above accessories are not necessary for pumps, there will be extra charge for them if needed)

| counter flange                                                                    | pump type                            | description | PN    | pipe work Connection           | rubber parts | Number of coupling sets needed |
|-----------------------------------------------------------------------------------|--------------------------------------|-------------|-------|--------------------------------|--------------|--------------------------------|
|  | RVA1<br>RVA2<br>RVA3<br>RVA4<br>RVA5 | Threaded    | 80bar | G1 <sup>1</sup> / <sub>4</sub> | EPDM         | 2                              |
|                                                                                   |                                      |             |       |                                | FKM          | 2                              |
|                                                                                   |                                      | For welding | 80bar | DN32                           | EPDM         | 2                              |
|                                                                                   |                                      |             |       |                                | FKM          | 2                              |
|                                                                                   | RVA10<br>RVA15<br>RVA20              | Threaded    | 70bar | G2                             | EPDM         | 2                              |
|                                                                                   |                                      |             |       |                                | FKM          | 2                              |
|                                                                                   |                                      | For welding | 70bar | DN50                           | EPDM         | 2                              |
|                                                                                   |                                      |             |       |                                | FKM          | 2                              |



Edition:2013.08

The technical data are subject to amend without notice.



Vendor Ref. No.

Contractor Ref. No

Project Name:

Contractor Job No.

JOCKEY PUMP  
CONTROLLER

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |



# TORNATECH

Project: \_\_\_\_\_

Customer: \_\_\_\_\_

Engineer: \_\_\_\_\_

Pump Manufacturer: \_\_\_\_\_

## Technical Data Submittal Document

### Model JP3

Across the Line Start  
Jockey Pump Controller



#### Contents:

Data Sheets

Dimensional Data

Wiring Schematics

Field Connections

**Note:** The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.



N.Y.C.  
APPROVED



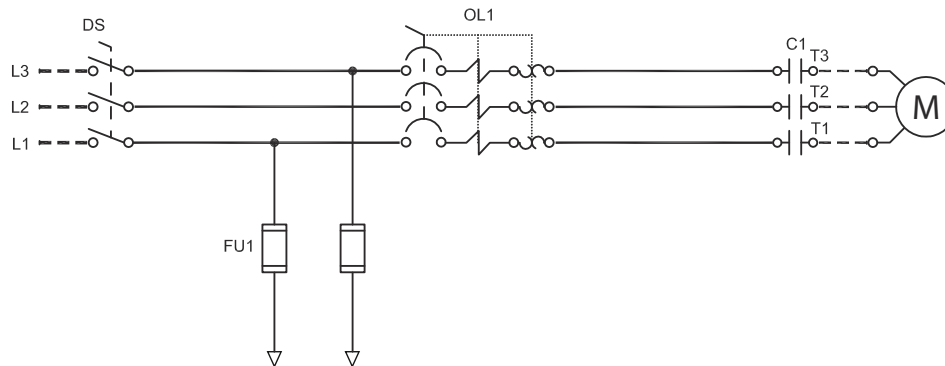
November 2020



# TORNATECH

## Technical Data

### Model JP3 Jockey Pump Controller



N.Y.C.  
APPROVED



OPTIONAL



|           |                                           |                                                                         |                               |
|-----------|-------------------------------------------|-------------------------------------------------------------------------|-------------------------------|
| Listing   | Underwriters Laboratory (UL)              | UL508A - Industrial Pump Controllers                                    |                               |
|           | New York City                             | Accepted for use in the City of New York by the Department of Buildings |                               |
|           | Seismic Certification                     | See page 4 for details                                                  |                               |
|           | Optional                                  |                                                                         |                               |
|           | <input type="checkbox"/> CE Mark          | Various EN, IEC & CEE directives and standards                          |                               |
| Enclosure | Protection Rating                         |                                                                         |                               |
|           | <input type="checkbox"/> Standard: NEMA 2 |                                                                         |                               |
|           | Optional                                  |                                                                         |                               |
|           | <input type="checkbox"/> NEMA 12          | <input type="checkbox"/> NEMA 4X-304 sst painted                        | <input type="checkbox"/> IP54 |
|           | <input type="checkbox"/> NEMA 3           | <input type="checkbox"/> NEMA 4X-304 sst brushed finish                 | <input type="checkbox"/> IP55 |
|           | <input type="checkbox"/> NEMA 3R          | <input type="checkbox"/> NEMA 4X-316 sst painted                        | <input type="checkbox"/> IP65 |
|           | <input type="checkbox"/> NEMA 4           | <input type="checkbox"/> NEMA 4X-316 sst brushed finish                 | <input type="checkbox"/> IP66 |
|           | Accessories                               |                                                                         | Paint Specifications          |
|           | • Wall mounting lugs ( x4)                |                                                                         | • Red RAL3002                 |
|           |                                           |                                                                         | • Powder coating              |
|           |                                           | • Glossy textured finish                                                |                               |

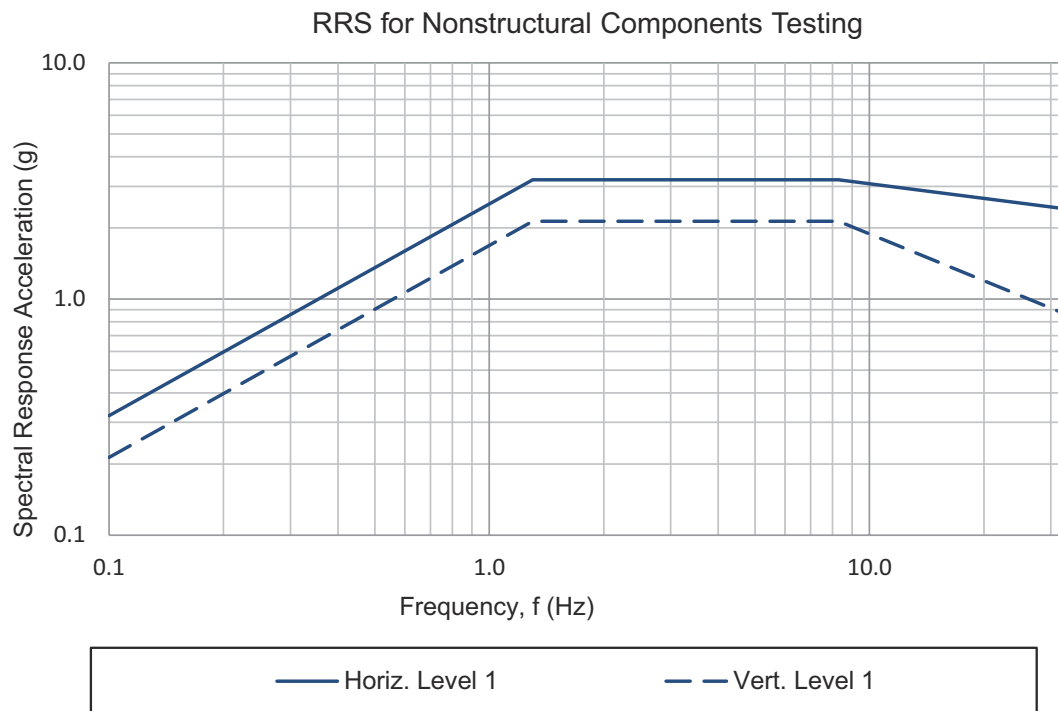


|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                     |                                                                                                                           |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Fuseless Motor Starter</b>  | <ul style="list-style-type: none"> <li>• Main disconnect – padlockable – rotary type handle – door interlocked</li> <li>• Thermo-magnetic motor protector</li> <li>• Contactor</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                     |                                                                                                                           |
| <b>Control Circuit</b>         | <ul style="list-style-type: none"> <li>• 24V.AC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                           |
| <b>iPD+ Operator Interface</b> | <ul style="list-style-type: none"> <li>• Solid state controls</li> <li>• All adjustments on door front</li> <li>• Navigation pushbuttons</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                     |                                                                                                                           |
| <b>Pressure Sensing</b>        | <ul style="list-style-type: none"> <li>• Pressure transducer for fresh water application 316 stainless steel construction</li> <li>• Rated for 0-600psi working pressure</li> <li>• Pressure sensing line connection 1/2" brass Male NPT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                            |                                     |                                                                                                                           |
| <b>Visual Indications</b>      | <ul style="list-style-type: none"> <li>• Manual motor start/run LED</li> <li>• Automatic motor start/run LED</li> <li>• Motor overload</li> <li>• Pressure reading <ul style="list-style-type: none"> <li>• Start pressure</li> <li>• Stop pressure</li> <li>• System pressure</li> </ul> </li> <li>• System pressure diagnostic LED's <ul style="list-style-type: none"> <li>• Green: system pressure at or above stop pressure</li> <li>• Yellow: system pressure between start and stop pressure</li> <li>• Red: system pressure at or below start pressure</li> </ul> </li> <li>• AUTO mode</li> <li>• OFF mode</li> </ul> |                                     |                                                                                                                           |
| <b>Timers</b>                  | <ul style="list-style-type: none"> <li>• Minimum run timer (off delay)</li> <li>• Delay start timer (on delay)</li> <li>• Visual countdown</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                     |                                                                                                                           |
| <b>Counters</b>                | <ul style="list-style-type: none"> <li>• Pump start counter</li> <li>• Elapsed timer meter (hours / non-resettable)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                     |                                                                                                                           |
| <b>Operators</b>               | <ul style="list-style-type: none"> <li>• OFF-AUTO pushbutton</li> <li>• Start and Stop pushbutton</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     |                                                                                                                           |
| <b>Operation</b>               | Automatic Start                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Start on pressure drop              |                                                                                                                           |
|                                | Manual Start                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Start pushbutton                    |                                                                                                                           |
|                                | Stopping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Stop pushbutton                     |                                                                                                                           |
|                                | Timers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Field adjustable & visual countdown | <ul style="list-style-type: none"> <li>• Minimum run timer (off delay)</li> <li>• Delay start timer (on delay)</li> </ul> |





|                       |                               |                                                     |               |                      |                 |     |                         |                    |                    |                    |                    |
|-----------------------|-------------------------------|-----------------------------------------------------|---------------|----------------------|-----------------|-----|-------------------------|--------------------|--------------------|--------------------|--------------------|
| Seismic Certification | Seismic Certification Company | TRU Compliance, LLC<br>A Tobalski Watkins Affiliate |               |                      |                 |     | TWEI Project No.: 15014 |                    |                    |                    |                    |
|                       | Mounting details              | Rigid wall mounting                                 |               |                      |                 |     |                         |                    |                    |                    |                    |
|                       | Seismic Information           | Building Code                                       | Test Criteria | Seismic Parameters   | S <sub>Ds</sub> | z/h | I <sub>p</sub>          | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|                       |                               | IBC 2015, CBC 2016                                  | ICC-ES AC156  | ASCE 7-10 Chapter 13 | 2.0             | 1.0 | 1.5                     | 3.20               | 2.40               | 1.33               | 0.53               |
|                       |                               |                                                     |               |                      | 3.2             | 0.0 | 1.5                     | 3.20               | 1.28               | 2.13               | 0.85               |



#### Notes:

- Components are tested in accordance with ICC-ES AC156, IBC 2015 & CBC 2016.
- OSHPD Special Seismic Certification Preapproval (OSP)

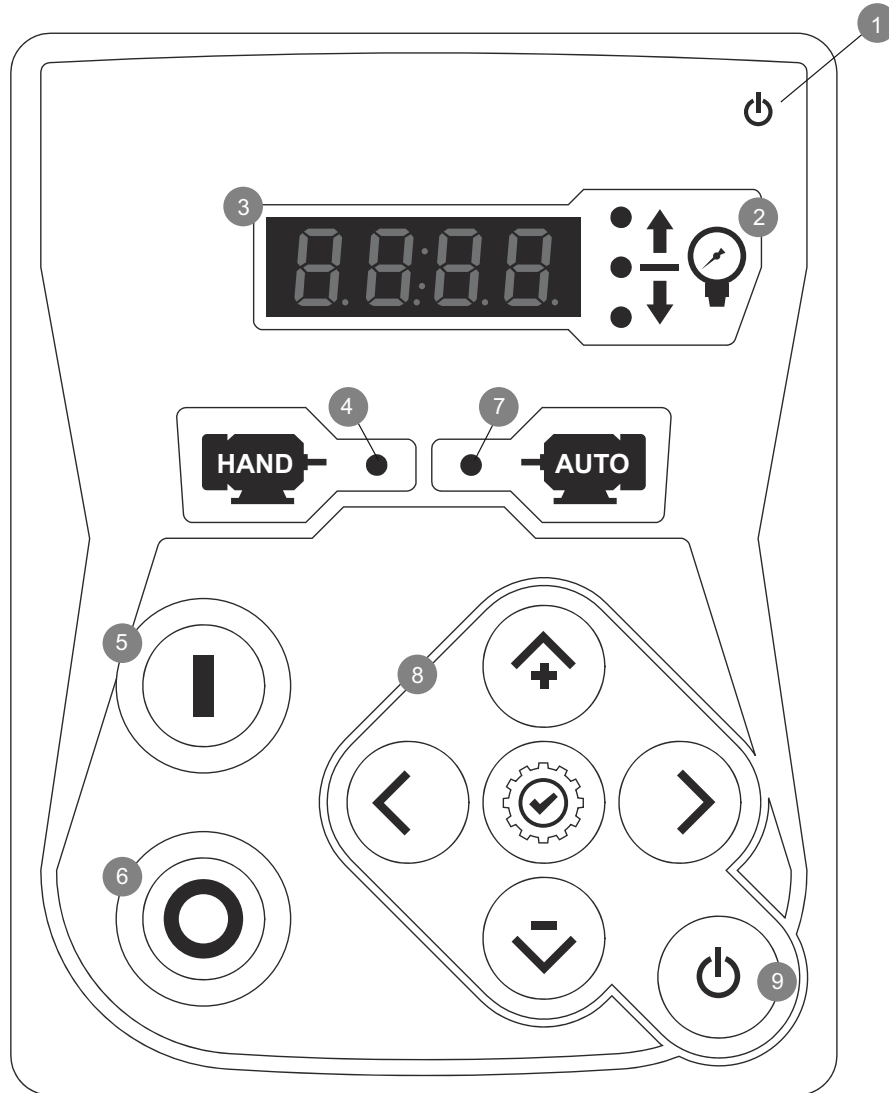


|                               |                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> A4   | Elapsed time meter (time totalizer)                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> A5   | Motor run alarm contact                                                                                                                                                                                                                                                                                                                                             |
| <input type="checkbox"/> A6   | Loss of power alarm contact                                                                                                                                                                                                                                                                                                                                         |
| <input type="checkbox"/> A7   | Overload or short circuit alarm contact                                                                                                                                                                                                                                                                                                                             |
| <input type="checkbox"/> D11D | Pressure transducer 0-600psi with ½" MNPT 316 stainless steel bushing                                                                                                                                                                                                                                                                                               |
| <input type="checkbox"/> D14  | Export packing for 1 controller                                                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/> D13A | Externally mounted wetted parts                                                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/> D14  | Export packing for 1 controller                                                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/> D18  | Audible alarm                                                                                                                                                                                                                                                                                                                                                       |
| <input type="checkbox"/> D19  | Anti-condensation heater and thermostat                                                                                                                                                                                                                                                                                                                             |
| <input type="checkbox"/> D20  | Anti-condensation heater and humidistat                                                                                                                                                                                                                                                                                                                             |
| <input type="checkbox"/> D21  | Tropicalization                                                                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/> D22  | Phase reversal / failure pilot light and alarm contact                                                                                                                                                                                                                                                                                                              |
| <input type="checkbox"/> D23  | Controller power healthy pilot light and alarm contact                                                                                                                                                                                                                                                                                                              |
| <input type="checkbox"/> D24  | Pump failure via current sensing relay with pilot light and dry alarm contact                                                                                                                                                                                                                                                                                       |
| <input type="checkbox"/> D25  | Low zone pump control function                                                                                                                                                                                                                                                                                                                                      |
| <input type="checkbox"/> D26  | Mid zone pump control function                                                                                                                                                                                                                                                                                                                                      |
| <input type="checkbox"/> D27  | High zone pump control function                                                                                                                                                                                                                                                                                                                                     |
| <input type="checkbox"/> D28  | Selector switch in auto alarm contacts                                                                                                                                                                                                                                                                                                                              |
| <input type="checkbox"/> D29  | Selector switch in off alarm contacts                                                                                                                                                                                                                                                                                                                               |
| <input type="checkbox"/> D30  | Motor heater circuit                                                                                                                                                                                                                                                                                                                                                |
| <input type="checkbox"/> D32  | Service entrance rated - 100kA short circuit withstand rating:<br><ul style="list-style-type: none"> <li>• 120V/1ph (0.5hp max.)</li> <li>• 240V/1ph (1hp max.)</li> <li>• 200V-208V - 60hz (2hp max.)</li> <li>• 220V-240V - 60hz (3hp max.)</li> <li>• 380V-416V - 50hz - 60hz (5hp max.)</li> <li>• 440V-480V - 60hz (5hp max.)</li> </ul>                       |
| <input type="checkbox"/> D33  | Service entrance rated - 65kA short circuit withstand rating:<br><ul style="list-style-type: none"> <li>• 120V/1ph (0.5hp max.)</li> <li>• 240V/1ph (1hp max.)</li> <li>• 200V-208V - 60hz (3hp-15hp max.)</li> <li>• 220V-240V - 60hz (515hp max.)</li> <li>• 380V-416V - 50hz - 60hz (7.5hp - 40hp max.)</li> <li>• 440V-480V - 60hz (7.5hp-40hp max.)</li> </ul> |
| <input type="checkbox"/> D34  | Service entrance rated - 42kA short circuit withstand rating:<br><ul style="list-style-type: none"> <li>• 600V - 60hz (7.5hp max.)</li> </ul>                                                                                                                                                                                                                       |

|                              |                                        |
|------------------------------|----------------------------------------|
| <input type="checkbox"/> L01 | Other language and English (bilingual) |
| <input type="checkbox"/> L02 | French                                 |
| <input type="checkbox"/> L03 | Spanish                                |
| <input type="checkbox"/> L04 | German                                 |
| <input type="checkbox"/> L05 | Italian                                |
| <input type="checkbox"/> L06 | Polish                                 |
| <input type="checkbox"/> L07 | Romanian                               |
| <input type="checkbox"/> L08 | Hungarian                              |
| <input type="checkbox"/> L09 | Slovak                                 |
| <input type="checkbox"/> L10 | Croatian                               |
| <input type="checkbox"/> L11 | Czech                                  |
| <input type="checkbox"/> L12 | Portuguese                             |
| <input type="checkbox"/> L13 | Dutch                                  |
| <input type="checkbox"/> L14 | Russian                                |
| <input type="checkbox"/> L15 | Turkish                                |
| <input type="checkbox"/> L16 | Swedish                                |
| <input type="checkbox"/> L17 | Bulgarian                              |
| <input type="checkbox"/> L18 | Thai                                   |
| <input type="checkbox"/> L19 | Indonesian                             |
| <input type="checkbox"/> L20 | Slovenian                              |
| <input type="checkbox"/> L21 | Danish                                 |
| <input type="checkbox"/> L22 | Greek                                  |
| <input type="checkbox"/> L23 | Arabic                                 |
| <input type="checkbox"/> L24 | Hebrew                                 |
| <input type="checkbox"/> L25 | Chinese                                |

Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.

### iPD+ Operator Interface



- |                       |                         |
|-----------------------|-------------------------|
| 1 - Power on LED      | 6 - STOP pushbutton     |
| 2 - System status LED | 7 - Auto start LED      |
| 3 - Digital display   | 8 - Navigation keypad   |
| 4 - Hand start LED    | 9 - ON - OFF pushbutton |
| 5 - START pushbutton  |                         |

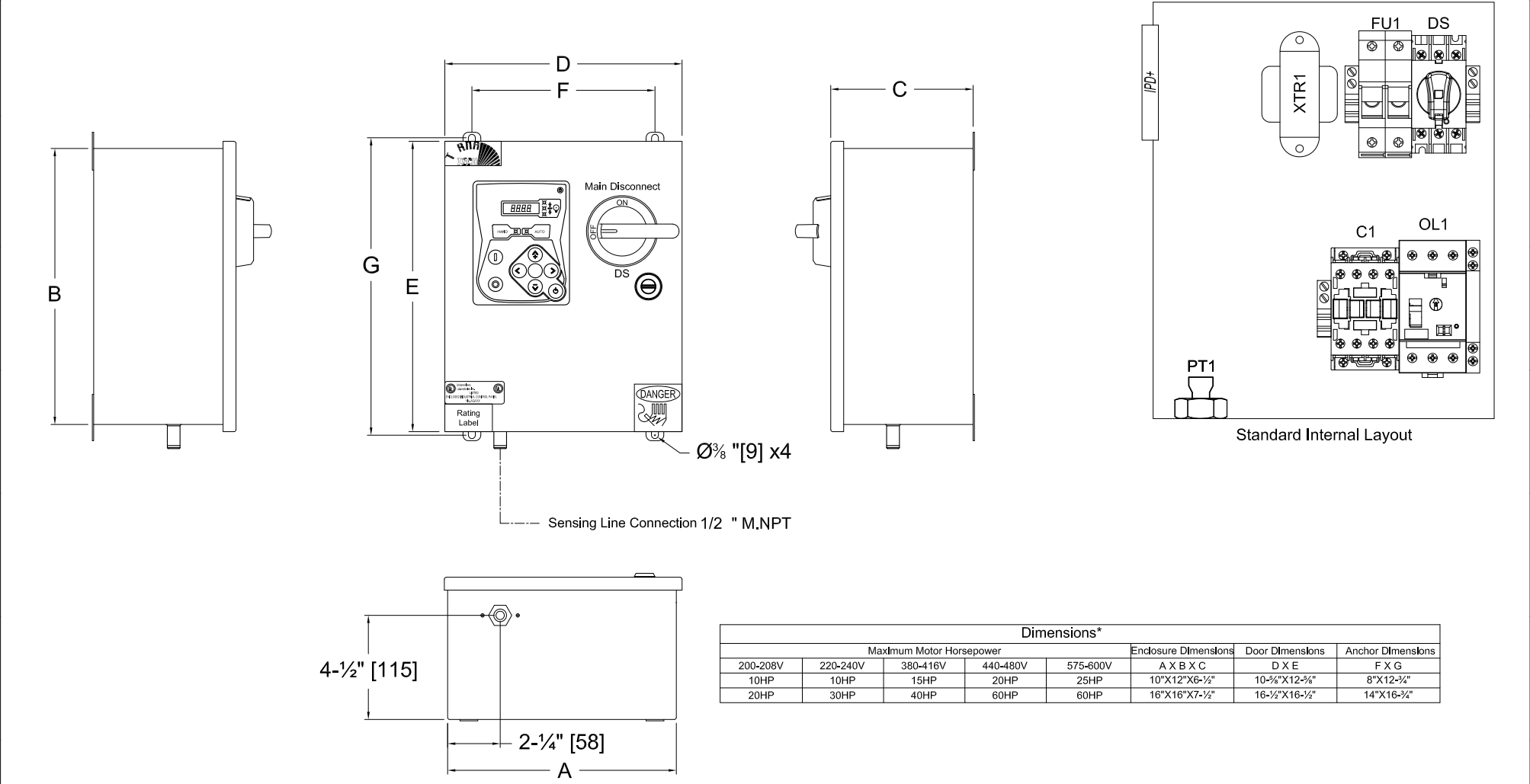
# Jockey Pump Controller

Across the Line / 3 Phase

Model:JP3

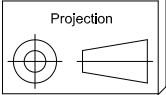
## Dimensions

|                       |                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------|----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| PER QUOTE DRAWING No. |                                  |  |  |  |  |
| DESCRIPTION           |                                  | DD/MM/YY                                                                          |                                                                                   |                                                                                   |                                                                                   |
| REV.                  |                                  |                                                                                   |                                                                                   |                                                                                   | Drawing No.                                                                       |
| 7                     | Revised logo                     |                                                                                   |                                                                                   | 18/06/18                                                                          | JP3-DI500/E                                                                       |
| 8                     | Sensing line connection changed  |                                                                                   |                                                                                   | 25/03/25                                                                          |                                                                                   |
| 9                     | UL logo updated CSA logo removed |                                                                                   |                                                                                   | 14/07/20                                                                          |                                                                                   |



- Notes:
- Standard NEMA: NEMA 2
  - Standard Paint: Textured Red RAL 3002.
  - All Dimensions are in Inches [Millimeters]
  - Use Watertight Conduit and Connector Only.
  - Protect Equipment Against Drilling Chips.
  - Door Swing Equal to Door Width

Drawing for information only.  
Manufacturer reserves the right to modify this drawing without notice.  
Contact manufacturer for "As Built" drawing.  
\*Dimensions may change depending on option required. Consult Factory for exact dimensions.



# Jockey Pump Controller

Across the Line / 3 Phase

## Wiring schematic

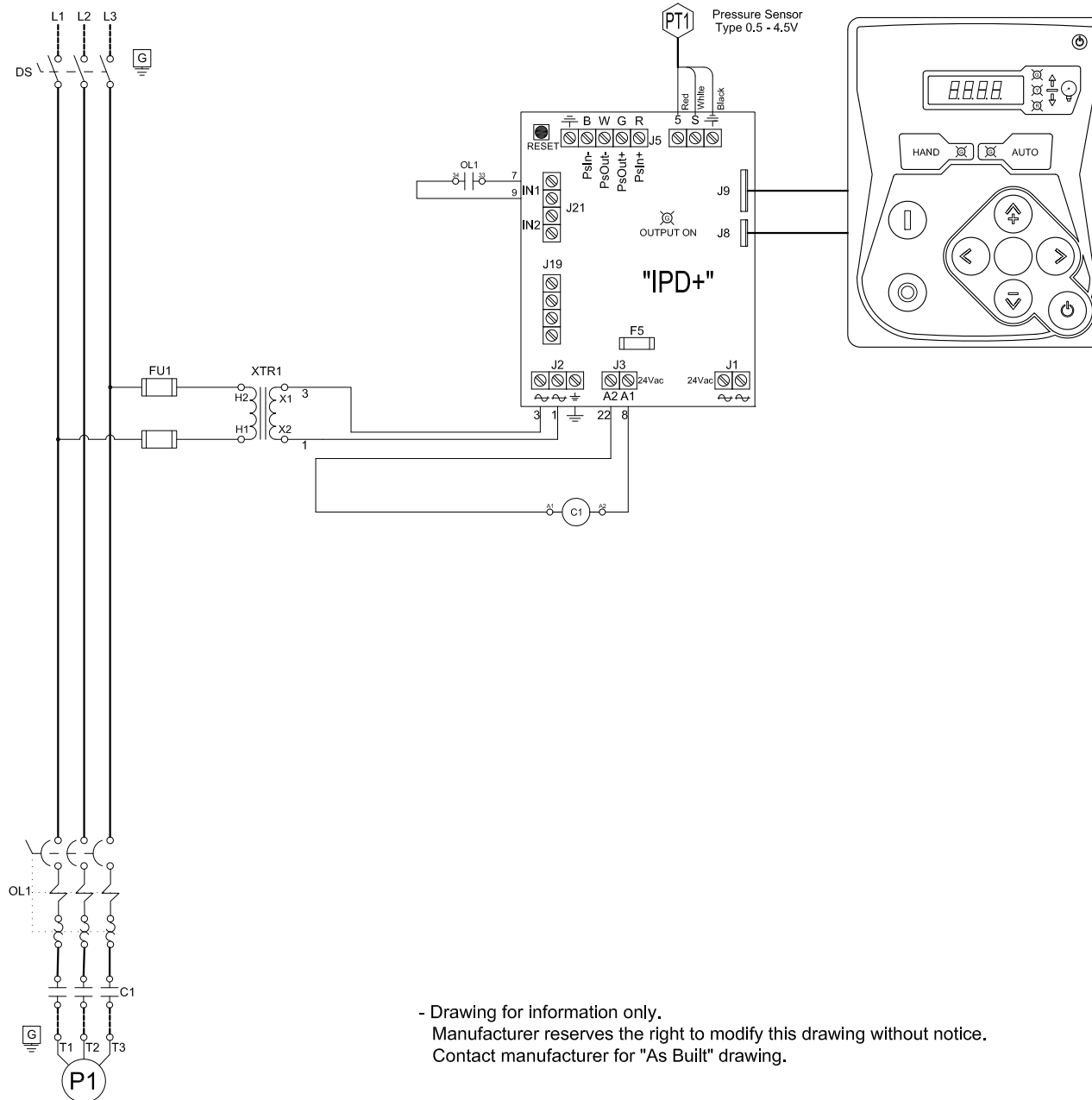
Model:JP3

PER QUOTE DRAWING No.



| REV. | DESCRIPTION                      | DD/MM/YY |
|------|----------------------------------|----------|
| 6    | Modified J19 Outputs ID          | 10/06/16 |
| 7    | Revised logo                     | 18/06/18 |
| 8    | UL logo updated CSA logo removed | 14/07/20 |

Drawing No.  
**JP3-WS500/E**



- Drawing for information only.  
Manufacturer reserves the right to modify this drawing without notice.  
Contact manufacturer for "As Built" drawing.



Jockey Pump Controller

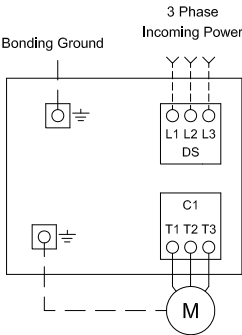
Across the Line / 3 Phase

Model:JP3

Line and Motor Terminal Size

|                       |                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------|----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| PER QUOTE DRAWING No. |                                  |  |  |  |  |
|                       |                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| REV.                  | DESCRIPTION                      | DD/MM/YY                                                                          |                                                                                   | Drawing No.                                                                       |                                                                                   |
| 6                     | Modified J19 Outputs ID          | 10/06/16                                                                          |                                                                                   | JP3-TD500/E                                                                       |                                                                                   |
| 7                     | Revised logo                     | 18/06/18                                                                          |                                                                                   |                                                                                   |                                                                                   |
| 8                     | UL logo updated CSA logo removed | 14/07/20                                                                          |                                                                                   |                                                                                   |                                                                                   |

Power Connections and Motor Connections



| Line Terminals (L1,L2,L3,GND) |          |          |          |          |                       |        |                              |
|-------------------------------|----------|----------|----------|----------|-----------------------|--------|------------------------------|
| Maximum Motor Horsepower      |          |          |          |          | Wire Size Copper Only | Torque | Wire Size Ground Copper Only |
| 200-208V                      | 220-240V | 380-416V | 440-480V | 575-600V |                       |        |                              |
| 10HP                          | 10HP     | 20HP     | 20HP     | 25HP     | #14 AWG - #6 AWG      | 2 Nm   | #14 AWG - #2 AWG             |
| 20HP                          | 30HP     | 40HP     | 60HP     | 60HP     | #12 AWG - #1 AWG      | 6 Nm   | #6 AWG - #2 AWG              |

| Motor Terminals (T1,T2,T3,GND) |          |          |          |          |                       |         |                              |
|--------------------------------|----------|----------|----------|----------|-----------------------|---------|------------------------------|
| Maximum Motor Horsepower       |          |          |          |          | Wire Size Copper Only | Torque  | Wire Size Ground Copper Only |
| 200-208V                       | 220-240V | 380-416V | 440-480V | 575-600V |                       |         |                              |
| 5HP                            | 7.5HP    | 10HP     | 15HP     | 20HP     | #14 AWG - #10 AWG     | 1.8 Nm  | #14 AWG - #2 AWG             |
| 10HP                           | 10HP     | 15HP     | 20HP     | 25HP     | #14 AWG - #6 AWG      | 2.5 Nm  | #12 AWG - #2 AWG             |
| 15HP                           | 20HP     | 30HP     | 50HP     | 50HP     | #10 AWG - #3 AWG      | 5 Nm    | #12 AWG - #2 AWG             |
| 20HP                           | 30HP     | 40HP     | 60HP     | 60HP     | #10 AWG - #2 AWG      | 11.3 Nm | #12 AWG - #2 AWG             |



|               |  |                     |  |
|---------------|--|---------------------|--|
|               |  | Vendor Ref. No.     |  |
|               |  |                     |  |
|               |  | Contractor Ref. No. |  |
| Project Name: |  | Contractor Job No.  |  |

ACCESSORIES

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

|                                                                                   |                 |                     |
|-----------------------------------------------------------------------------------|-----------------|---------------------|
|  | Vendor Ref. No. |                     |
|                                                                                   |                 |                     |
|                                                                                   |                 | Contractor Ref. No. |
| Project Name:                                                                     |                 | Contractor Job No.  |

Flow Meter

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |



# GERAND ENGINEERING

## "MODEL G" FIRE PUMP TEST METERS

Accurate Pump Performance and Quality Service for 50 Years

**NEW**

**BEST VALUE  
IN THE  
INDUSTRY**

**5 YEAR  
WARRANTY**

**MANUFACTURED  
IN THE USA**

**HIGH GRADE  
MATERIALS:**  
CARBON STEEL,  
STAINLESS STEEL,  
EPOXY AND  
MONEL



### MODEL-G METERS

-- RATING 500 PSI --  
(Buttweld, Grooved,  
300# Flanged)

-- RATING 275 PSI --  
(150# Flanged)

CALIBRATED VENTURI &  
ATTACHED GPM METER

4½" DIAL METER  
MOUNTS ON  
VENTURI BRACKET



**ADDITIONAL SIZES LISTED  
AT [WWW.GERAND.COM](http://WWW.GERAND.COM)**

| PUMP<br>GPM | PIPE SIZE | VENTURI<br>STYLE | METER<br>RANGE<br>(GPM) | VENTURI<br>LENGTH<br>(BUTTWELD OR<br>GROOVED) | VENTURI<br>LENGTH<br>(150#<br>FLANGED) | VENTURI<br>LENGTH<br>(300#<br>FLANGED) |
|-------------|-----------|------------------|-------------------------|-----------------------------------------------|----------------------------------------|----------------------------------------|
| 50          | 2"        | 685              | 25-100                  | 4½" THREADED                                  | -                                      | -                                      |
| 100         | 2 1/2"    | 746              | 50-200                  | 3" BUTTWELD<br>4" GROOVED                     | 9½"                                    | 10"                                    |
| 250         | 4"        | 744              | 125-500                 | 3½" BUTTWELD<br>3¾" GROOVED                   | 9½"                                    | 10¾"                                   |
| 300         | 4"        | 744              | 150-600                 |                                               |                                        |                                        |
| 450         | 4"        | 744              | 225-900                 |                                               |                                        |                                        |
| 500         | 5"        | 715              | 250-1000                | 5"                                            | 12"                                    | 13¾"                                   |
| 500         | 6"        | 743              | 250-1000                |                                               |                                        |                                        |
| 750         | 6"        | 743              | 375-1500                | 6"                                            | 13"                                    | 14¾"                                   |
| 1000        | 6"        | 743              | 500-2000                |                                               |                                        |                                        |
| 1250        | 6"        | 743              | 625-2500                |                                               |                                        |                                        |
| 1500        | 8"        | 750              | 750-3000                |                                               |                                        |                                        |
| 2000        | 8"        | 750              | 1000-4000               | 7"                                            | 15"                                    | 16¾"                                   |
| 2500        | 8"        | 750              | 1250-5000               |                                               |                                        |                                        |

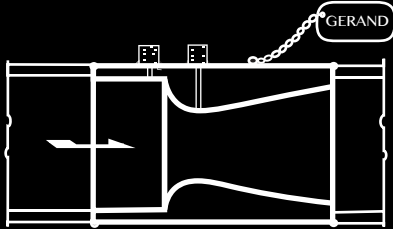
[WWW.GERAND.COM](http://WWW.GERAND.COM) FOR MORE INFORMATION

\*Venturi available in Raised or Flat Face; Steel, Stainless Steel or Monel

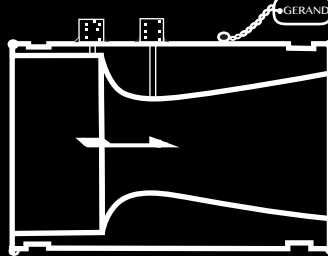
\*\*Dual LPM/GPM Scales Available

# VENTURI STYLES

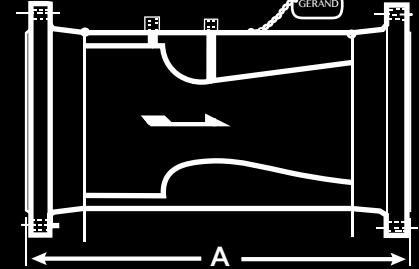
BUTTWELD



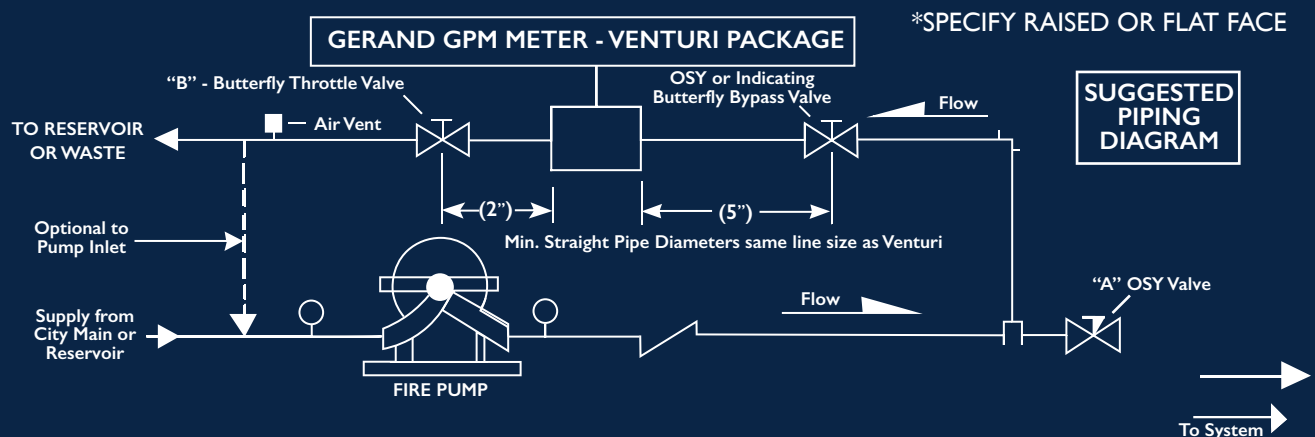
GROOVED



FLANGED



## OPERATING INSTRUCTIONS



1. Close system OSY valve "A"
2. Open by-pass valve and "B" butterfly throttle valve
3. Purge meter, located on venturi, as follows:
  - a) Open station shut-off valves on venturi & vent valves attached to meter. When a steady stream of water passes through hose, meter is purged of air.
  - b) Close the vent valves after purging.

4. Start the fire pump, and read meter in GPM.
5. Refer to pump GPM requirement and adjust throttle valve to meet the requirement.
6. After the test, open valve "A" and close the by-pass and "B" valves.





|                                                                                   |                 |                     |
|-----------------------------------------------------------------------------------|-----------------|---------------------|
|  | Vendor Ref. No. |                     |
|                                                                                   | Vendor Doc. No. |                     |
|                                                                                   |                 | Contractor Ref. No. |
| Project Name:                                                                     |                 | Contractor Job No.  |

Pressure Gauge

|     |                        |          |         |          |      |
|-----|------------------------|----------|---------|----------|------|
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
|     |                        |          |         |          |      |
| 0   | SUBMITTED FOR APPROVAL | MS       | KY      |          |      |
| Rev | Description            | Prepared | Checked | Approved | Date |

# Bourdon Tube Pressure Gauges Standard Series Type 111.10SP

WIKA Datasheet 111.10SP

## Applications

- Fire sprinkler systems
- Suitable for all media that will not obstruct the pressure system or attack copper alloy parts

## Product Features

- UL-listed (UL-393), United States and Canada
- Factory Mutual (FM) approved
- Reliable and economical



Bourdon Tube Pressure Gauge Type 111.10SP

## Specifications

### Design

EN 837-1 & ASME B40.100

### Sizes

4" (100 mm)

### Accuracy class

± 3/2/3% of span (ASME B40.100 Grade B)

### Ranges

0/80 psi (5,5 bar), retard to 250 psi (17 bar), air  
0/300 psi (20 bar), water  
0/400 psi (28 bar), water  
0/600 psi (40 bar), water

### Working pressure

Steady: 3/4 of full scale value  
Fluctuating: 2/3 of full scale value  
Short time: full scale value

### Operating temperature

Ambient: -40°F to 140°F (-40°C to 60°C)  
Media: 140°F (+60°C) maximum

### Temperature error

Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% of span for every 18°F (10°K) rising or falling.

### Bourdon tube

Material: copper alloy  
C-shape

### Pressure connection

Material: copper alloy  
1/4" NPT lower mount (LM)

### Movement

Copper alloy

### Dial

White aluminum with stop pin; black and red lettering

### Pointer

Black aluminum

### Case

Black polycarbonate

### Window

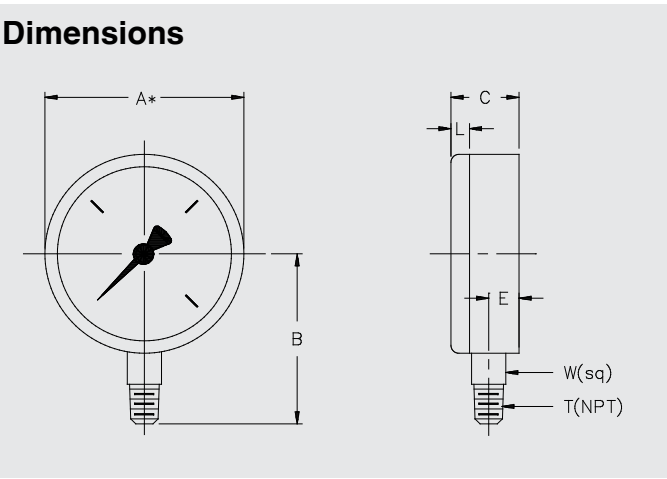
Snap-in clear polycarbonate

### Approvals

UL listed (UL-393)  
Factory Mutual

**Optional Extras**  
(not all options are UL or FM approved)

- Brass restrictor
- Black-painted steel case
- Custom dial layout
- Other dual scales in combination with psi are available:  
bar, kPa, MPa, kg/cm<sup>2</sup>



| Size |    | A   | B    | C    | E    | L    | T    | W    | Weight   |
|------|----|-----|------|------|------|------|------|------|----------|
| 4"   | mm | 100 | 71   | 30   | 11.5 | 3.75 |      | 14   |          |
|      | in | 4.0 | 2.79 | 1.18 | 0.45 | 0.15 | 1/4" | 0.55 | 0.35 lb. |

**Ordering information**  
Pressure gauge model / Nominal size / Scale range / Size of connection / Optional extras required  
Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.  
Modifications may take place and materials specified may be replaced by others without prior notice.

# Bourdon tube pressure gauge Model 111.11, welding gauge to ISO 5171

WIKA data sheet PM 01.03



for further approvals  
see page 2

## Applications

- For equipment and plants for welding, cutting and allied processes

## Special features

- Design per ISO 5171
- Pressure relief in case back
- Reliable and cost-effective



Bourdon tube pressure gauge model 111.11

## Description

### Design

ISO 5171

### Nominal size in mm

40, 50, 63

### Accuracy class

2.5

### Scale ranges

Welding engineering standard ranges for oxygen and acetylene to ISO 5171, as well as 0 ... 1 to 0 ... 400 bar to EN 837-1

### Pressure limitation

Steady: 3/4 x full scale value

Fluctuating: 2/3 x full scale value

Short time: Full scale value

### Permissible temperature

Ambient: -20 ... +60 °C

Medium: +60 °C maximum

### Temperature effect

When the temperature of the measuring system deviates from the reference temperature (+20 °C): max.  $\pm 0.4 \text{ } \%/10 \text{ K}$  of the span

## Standard version

### Process connection

Copper alloy, lower mount (LM), with restrictor

NS 40: G 1/8 B (male), 14 mm flats

NS 50,63: G 1/4 B (male), 14 mm flats

### Pressure element

Copper alloy (with acetylene, max. 70 % copper content),  
C-type or helical type

### Movement

Copper alloy

### Dial

Plastic, white, with pointer stop pin

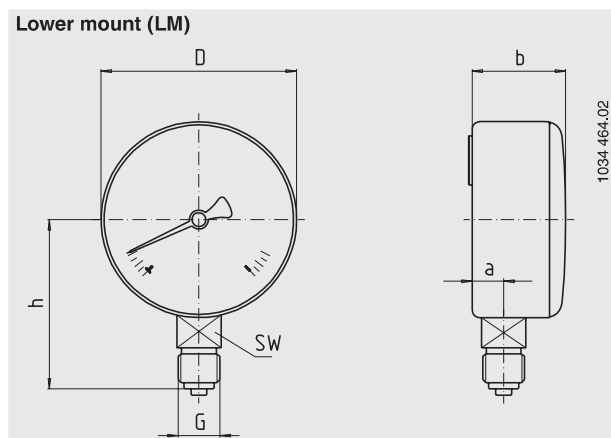
Black lettering

### Pointer

Plastic, black

## Dimensions in mm

### Standard version



| NS | Dimensions in mm |    |    |         |      |    | Weight in kg |
|----|------------------|----|----|---------|------|----|--------------|
|    | a                | b  | D  | G       | h ±1 | SW |              |
| 40 | 9.5              | 26 | 39 | G 1/8 B | 36   | 14 | 0.09         |
| 50 | 9.5              | 28 | 49 | G 1/4 B | 45   | 14 | 0.11         |
| 63 | 9.5              | 28 | 62 | G 1/4 B | 53.5 | 14 | 0.15         |

Process connection per EN 837-1 / 7.3

### Ordering information

Model / Nominal size / Scale range / Connection size / Options

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The specifications given in this document represent the state of engineering at the time of publishing.  
We reserve the right to make modifications to the specifications and materials.

### Case

Steel, brass-coloured,  
with pressure relief in case back

### Window

Polycarbonate, snap-fitted in case

## Options

- Other process connection
- Sealings (model 910.17, see data sheet AC 09.08)
- Case brass or stainless steel
- Slip-on bezel
- Back mount (BM)
- Acetylene pressure gauge for pressure regulators for manifold systems per ISO 7291 (BAM tested)

## CE conformity

### Pressure equipment directive

97/23/EC, PS > 200 bar, module A, pressure accessory

## Approvals

- GOST, metrology/measurement technology, Russia
- GOST-R, import certificate, Russia
- CRN, safety (e.g. electr. safety, overpressure, ...), Canada

## Certificates <sup>1)</sup>

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy)
- 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)

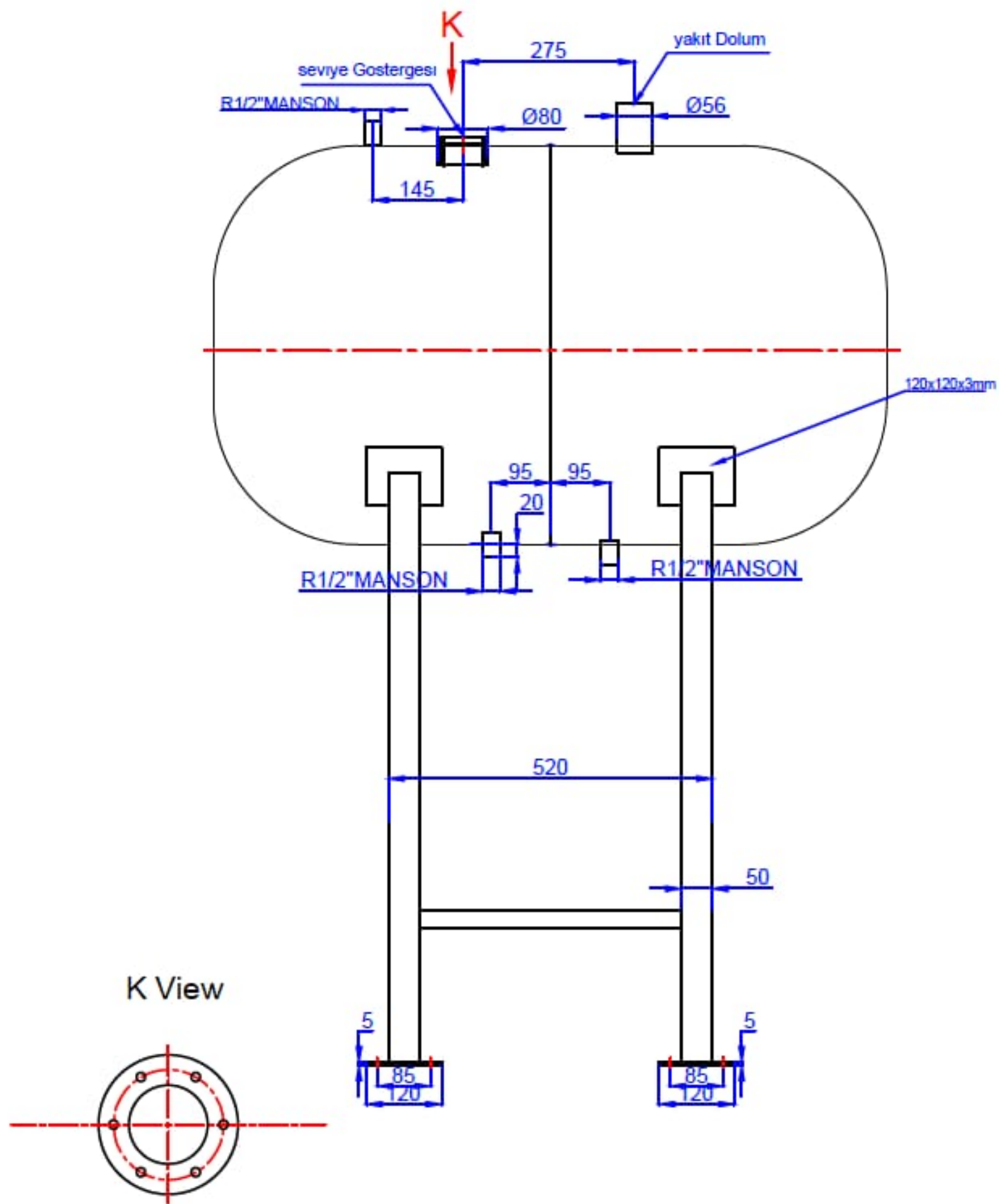
1) Option

Approvals and certificates, see website



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63911 Klingenberg/Germany  
Tel. +49 9372 132-0  
Fax +49 9372 132-406  
info@wika.de  
www.wika.de





The level indicator  
flange will look like this.

300 LT DIESEL TANK