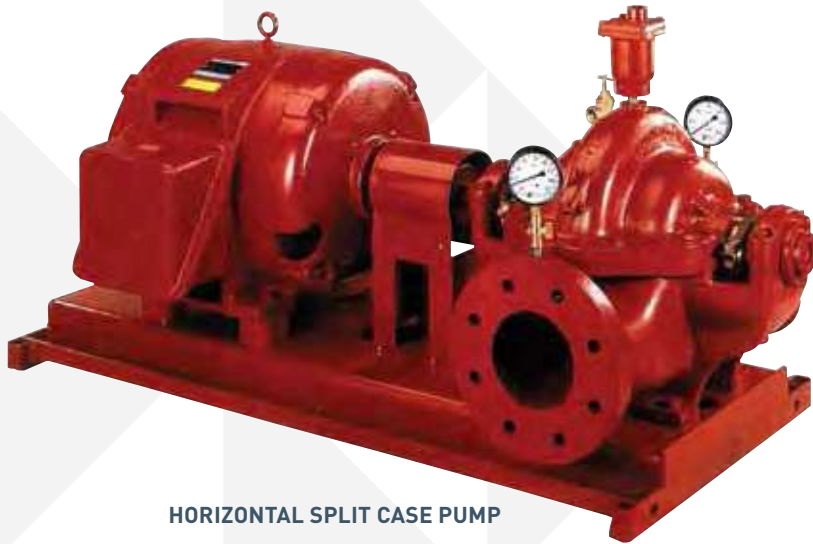


Fire Pumps Full Technical Submittal

Flow rate: 250 GPM at Head: 115 PSI



HORIZONTAL SPLIT CASE PUMP



VERTICAL SPLIT CASE PUMP

FAIRBANKS NIJHUIS™ 900 SERIES SPLIT CASE FIRE PUMPS

Built Per NFPA 20



FAIRBANKS NIJHUIS™ 900 SERIES

Split Case Fire Pumps

Horizontal split case pumps are the most common type of fire pump. These pumps are specifically designed and tested for fire service applications where reliability of performance is of vital importance. Split case pumps are characterized by:

- Easy access to all working parts;
- Rugged construction;
- Liberal water passages; and
- Efficient operation.

Split case fire pumps are specified when the source of water is located above the surface of the ground and provides a positive suction pressure to the pump at any performance point. Single-stage or multistage pumps are available dependent upon discharge pressure requirements.

Fairbanks Nijhuis split case fire pumps are built per the rigid standards of NFPA 20 and are listed by Underwriters Laboratories (UL) and approved by Factory Mutual (FM).

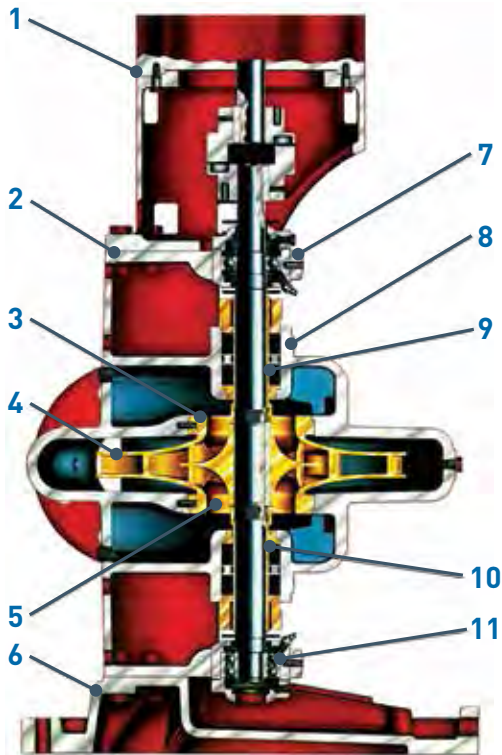
Available in a broad range of operating pressures and flows from a minimum of 250 GPM, Fairbanks Nijhuis split case pumps can be driven by either an electric motor or diesel engine. Fairbanks Nijhuis' UL-Listed, FM-Approved fire pump packages also include the system controller, with a full range of options and accessories available to complete the NFPA-compliant fire pump package.



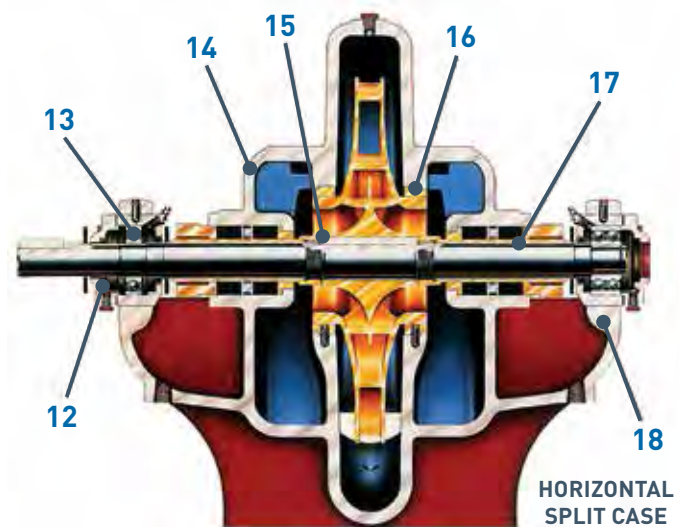
In addition to horizontal split case pumps, Fairbanks Nijhuis also offers split case performance in a vertical format. Vertical fire pumps provide distinct advantages over horizontal pump constructions.

- Less floor space is required.
- In-line piping arrangement allows piping in any direction in most cases.
- Elevated motor protects against potential flooding if the pump station is in a low area.
- Components are register-fitted to prevent misalignment.

Pump Features



**VERTICAL
SPLIT CASE**



**HORIZONTAL
SPLIT CASE**

- 1. Computer Machined**
major components with 360 degree registered fits to assure concentricity of parts.
- 2. Integral Bearing Arms**
eliminate bearing misalignment and simplify maintenance.
- 3. Enclosed Impeller Design**
provides high efficiency and performance.
- 4. Dynamically Balanced Impeller**
is keyed to the shaft and secured by adjustable shaft sleeves.
- 5. Double Suction Impeller**
balances hydraulic thrust loads.
- 6. Cast Iron Drip Rim Base**
directs condensation and any stuffing box leakage to drain.
- 7. Short Bearing Span**
holds shaft deflection to .002" at face of stuffing box at maximum load.
- 8. Internal Water Seal Passages**
between volute and stuffing box cannot be damaged.
- 9. Interwoven, Graphite Impregnated T.F.E.**
diagonally cut packing rings seal the pump shaft.
- 10. Stuffing Boxes**
are extra deep for proper sealing. Split packing glands simplify packing maintenance.
- 11. Double Row Thrust**
ball bearing.
- 12. Grease Seals**
and nonsparking neoprene rotating slingers protect both bearings during pump operation and washdown.
- 13. Bearings**
selected for 50,000 hour minimum life at maximum load. Average bearing life 5 x minimum.
- 14. Split Case Design**
simplifies disassembly. The suction and discharge piping and shaft alignment are not disturbed.
- 15. O-Ring Sealed Shaft Sleeves**
prevent corrosion of the shaft. This eliminates the need for stainless steel shafts.
- 16. Case Wearing Rings**
and throttle bushings protect the casing from wear and are easily and inexpensively replaced.
- 17. Bronze Shaft Sleeve**
prevents shaft wear, is slip fit over the shaft, keylocked, and extends the entire length of the seal box.
- 18. Certified Performance Test with Positive Suction Pressure**
is provided for each fire pump for customer approval. Pumps are also hydrostatically tested per NFPA 20 at no less than 250 psi.

Fire Pump Feature Selector

Standard

- Bronze fitted pump construction
- Bronze shaft sleeves
- Bronze case wearing rings
- Dynamically balanced impellers
- Stainless steel impeller key
- Carbon steel shaft
- Corrosion-resistant lantern rings*
- Bronze stuffing box bushings
- Bronze or stainless steel glands
- Interwoven graphite-impregnated T.F.E. packing rings
- Cast integral bearing arms (most models)
- Regreaseable ball bearings
- Double row thrust bearing (outboard side)
- Upper casing lifting lugs
- Water slingers and grease seals
- Hydrostatic and Certified Performance test**
- Coupling guard
- Suction and discharge gauges with shutoff cocks
- Automatic air release valve
- Casing relief valve (electric driven units only)

Optional

- Ductile iron casings (available in selected 1800 and 1900 models)
- Some models available in 316 SST, duplex and super duplex
- Right- or left-hand rotation
- Impeller wearing rings
- Stainless steel shafts
- Double row ball bearings on inboard side
- External bypass line from casing to stuffing boxes (optional on Model 1800s and 1900s, standard on Model 2800s and 5800s)
- Formed steel drip-rim base (horizontal electric driven units only)
- 15' Suction lift test to verify performance at 150% of rated flow
- Available accessories include valves, headers, main relief valves, increasers and reducers, waste cones, and more.



www.FairbanksNijhuis.com

800 AIRPORT ROAD, NORTH AURORA, ILLINOIS 60542 USA
PARALLELWEG 4, 7102 DE, WINTERSWIJK, THE NETHERLANDS
NO. 10 JIA YE ROAD BIN HU DISTRICT, WUXI CITY, JIANG SU PROVINCE, CHINA 214124

Because we are continuously improving our products and services, Pentair reserves the right to change specifications without prior notice.
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Electric Pump



SECTION A

ELECTRIC DRIVEN PUMP

A.1. Pump Base (UL Listed & FM Approved):

Fairbanks Nijhuis Fire pumps

- Horizontal Splitcase 2-1/2"-1823BF
- Flow: 250 GPM
- Pressure rated: 115 Psi
- Speed: 2950 RPM
- Shutoff head: 120 Psi

Pump Construction:

- Material of construction: Cast Iron casing.
- Impeller Material: Bronze
- Pump rotation: Right handed
- Flange rating (Suction/Discharge): 125/125 LB (3"/2.5")
- Pump base: Steel bent form base
- Shaft Material: Carbon Steel AISI C1045

A.2. Pump Motor (UL Listed):

- Manufacturer: USEM
- Horsepower: 40 HP
- Enclosure: ODP
- Speed: 3000 RPM
- Frequency: 50 Hz
- Voltage: 380 V
- Transition: Wye-Delta-Open.
- Insulation Class F, Design B, NEMA MG-1

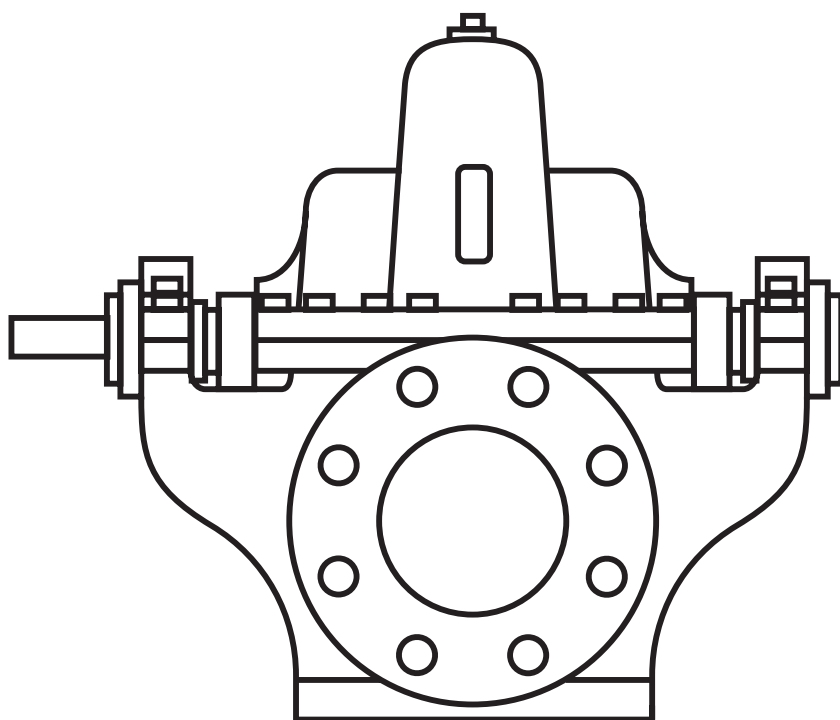
A.3. Pump Controller (UL Listed & FM Approved):

- Manufacturer: Tornatech GPY
- Horsepower: 40 HP
- Enclosure: NEMA 2
- Frequency: 50 Hz
- Voltage: 380 V
- Transition: Wye-Delta-Open

A.4. Pump Accessories:

- Casing relief valve: UL listed & FM approved.
- Air release valve.
- 2 Pressure gauges for suction & discharge.

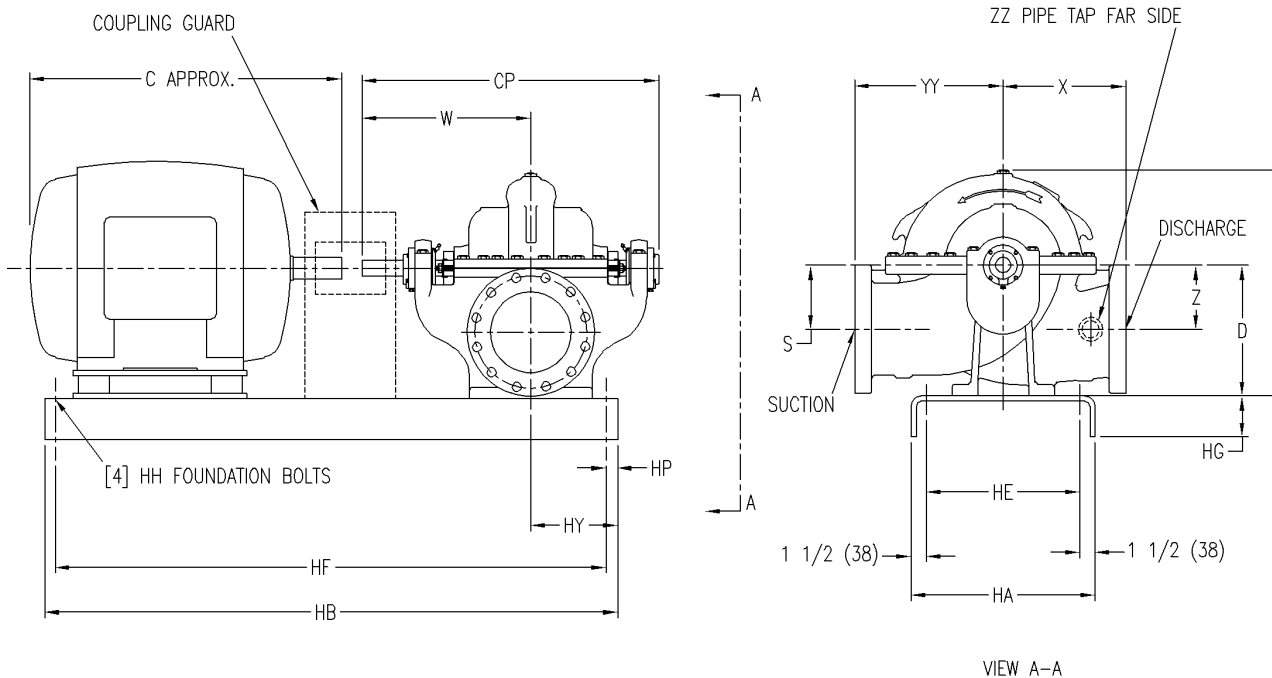
(Dimensions & Curves)



General Arrangement

WARNING

DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARD IN PLACE. ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARD CAN RESULT IN SEVERE BODILY INJURY.



CP	W	X	YY	D	Z	S	HY	ZZ
610	343	248	254	203	102	102	127	31.75

C	HA	HB	HE	HF	HG	HH	HP	O
610	381	1,118	305	483	85.72	15.87	610	406

NOTES:

Not for construction, installation, or application purposes unless certified.

All dimensions are in mm

Dimensions may vary $\pm 1/2"$ (13mm) due to normal manufacturing tolerances.

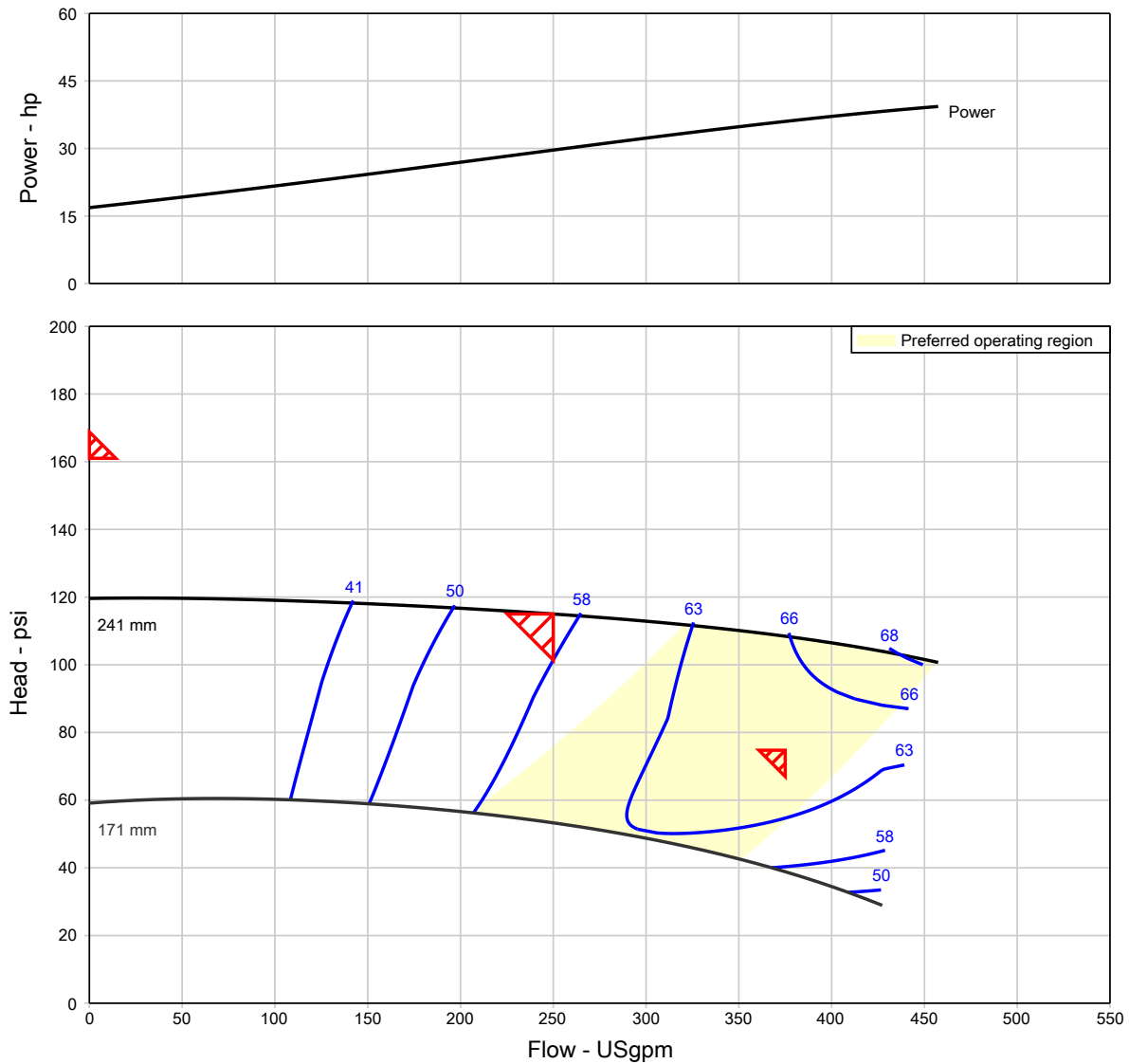
Bases are designed to be completely filled with grout.

Coupling gap may vary $1/8"$ (3mm) through $2 1/16"$ (52mm)

See configuration for estimated total weight.

Pump Data	
Series	Horizontal Splitcase
Model	2-1/2"-1823BF
Size	2.5x3x10B
Flow	250.0 USgpm
Rated Pressure	7.93 bar.g
RPM	2950 rpm
Rotation	Right handed
Liquid Type	Water
Discharge Size	63.50 mm
Suction Size	76.20 mm
Impeller Diameter	241 mm
Connection Type	125/125
Base Type	Steel bent form base
-	-
Pump Materials of Construction	
Pump	Bronze fitted with Cast Iron casing
Shaft	Carbon Steel AISI C1045
Motor Data	
Power	40.00 hp
Phase	3
Frequency	50 Hz
Volts	380 V
RPM	3000
Service Factor	1.15
Enclosure	ODP
Manufacturer	USEM
Site Information	
Elevation	91.44 m
Temperature	25.00 deg C
Estimated Weights	
Pump	159.7 kg
Driver	186.0 kg

Quote Information		
Customer	EGS	
Customer Quote		
Job Name	BDC New Aswan Branch BLDG.	
Market	-	
	Quote Item	001
	Quote Date	



Item number	: 001	Size	: 2-1/2"-1823BF
Service	:	Stages	: 1
Quantity	: 1	Driver type	: Motor
Quote number	:	Frequency	: 50 Hz
Date last saved	:	Speed, rated	: 2950 rpm
Flow, rated	: 250.0 USgpm	Based on curve number	: 184-2.5X3X10B-2950
Differential head / pressure, rated	: 115.0 psi	Efficiency	: 56.58 %
Flange rating (suction / discharge)	: 125/125	Max working pressure, allowable	: 12.07 bar.g
Secondary Point (150% of rated flow)	: 375.0 USgpm	Shutoffhead, Typical	: 119.6 psi
Secondary Point (65% of rated head)	: 74.75 psi	Max suction pressure, allowable	: 3.82 bar.g
Max Shutoff per NFPA	: 161.0 psi	Suction pressure, max (user specified)	: 0.00 bar.g
		Pump shutoff w/ suction pressure	: 8.25 bar.g
		Power driver, minimum	: 40.00 hp

(UL Listing Certificate)



Model 2-1/2-1823BF

File Number: EX743

COMPANY

PENTAIR PUMP GROUP INC, DBA FAIRBANKS NIJHUIS

800 AIRPORT RD

NORTH AURORA, IL 60542 United States

MODEL INFO

2-1/2-1823BF

Centrifugal Fire Pumps, Split Case, Single Stage

RATING DETAILS

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)
250 (946)	3	2-1/2	51 (351)	115 (792)	2950	250 (1,723)
250 (946)	3	2-1/2	52 (358)	167 (1,151)	3560	250 (1,723)

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(FM Approval)



Fire Pump Components | Fire Pumps | **Centrifugal Fire Pumps, Horizontal Split-Case Type (Horizontal Mounted)**

2-1/2-1823BF

Details

Category	Centrifugal Fire Pumps, Horizontal Split-Case Type (Horizontal Mounted)
Class of Work	1311 - Centrifugal Fire Pumps, Horz
Approval Standard	FM 1311 - Centrifugal Fire Pumps Split-Case Type (Axial or Radial)
Certification Type	FM Approved
Rated Capacity, (gal/min)	250
Rated Capacity, (dm³/min)	945
Rated Net Head at Rated Capacity, psi	50-115
Rated Net Head at Rated Capacity, kPa	345-795
Rated Speed, r/min	2950
Suction Inlet, dia., in.	3
Discharge Outlet, dia., in.	2 1/2
Stage(s)	1
Listing Country	United States of America

Company

Fairbanks Nijhuis, A Member of the Pentair Pump Group
 800 Airport Rd, North Aurora , Illinois 60542
 United States of America
<http://fairbanksnijhuis.com>

(Electric Controller)





TORNATECH

Project: _____

Customer: _____

Engineer: _____

Pump Manufacturer: _____

Technical Data Submittal Document

GPx Series

Full Service
Electric Fire Pump Controller



Contents:

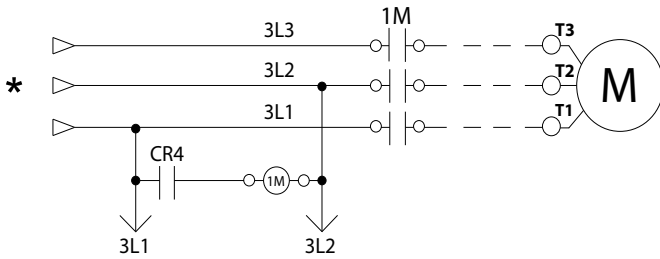
Data Sheets
Dimensional Data
Wiring Schematics
Field Connections

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.

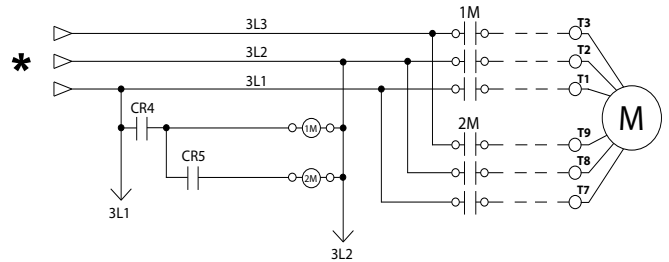


Select starting method

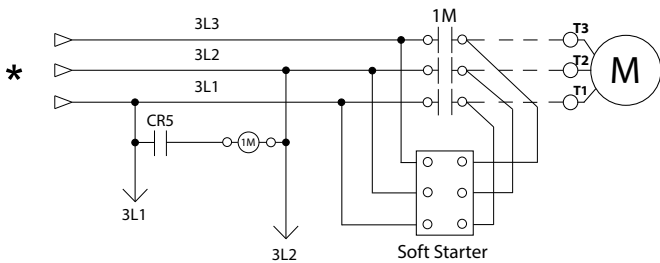
Model GPA Across the line



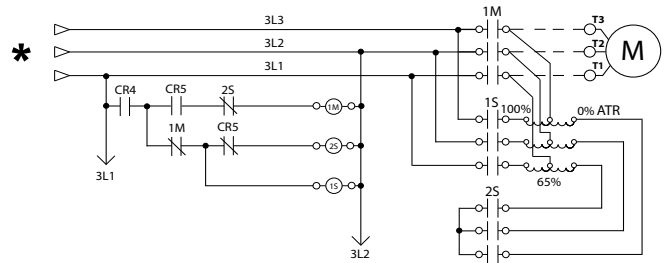
Model GPP Partwinding



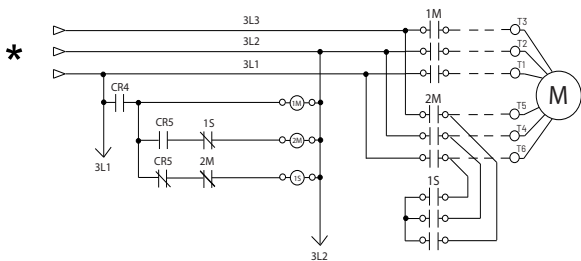
Model GPS Soft Start Soft Stop



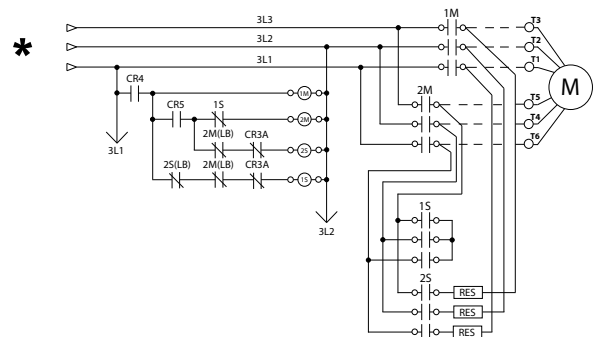
Model GPR Autotransformer



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	
	Seismic Certification	See page 7 for details	
	CE Mark	Various EN, IEC & CEE directives and standards	
	Built in Canada or U.A.E	Built in Europe	
	CE Mark Option	Supplied as Standard	
Enclosure	Protection Rating		
	Built in Canada or U.A.E	Built in Europe	
	Standard: NEMA 2	Standard: IP55	
	Optional		
	NEMA 12	NEMA 4X-304 sst painted	IP54
	NEMA 3	NEMA 4X-304 sst brushed finish	IP55
	NEMA 3R	NEMA 4X-316 sst painted	IP65
	NEMA 4	NEMA 4X-316 sst brushed finish	IP66
	Accessories • Bottom entry gland plate • Lifting Lugs • Keylock handle	Paint Specifications • Red RAL3002 • Powder coating • Glossy textured finish	

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



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



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

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

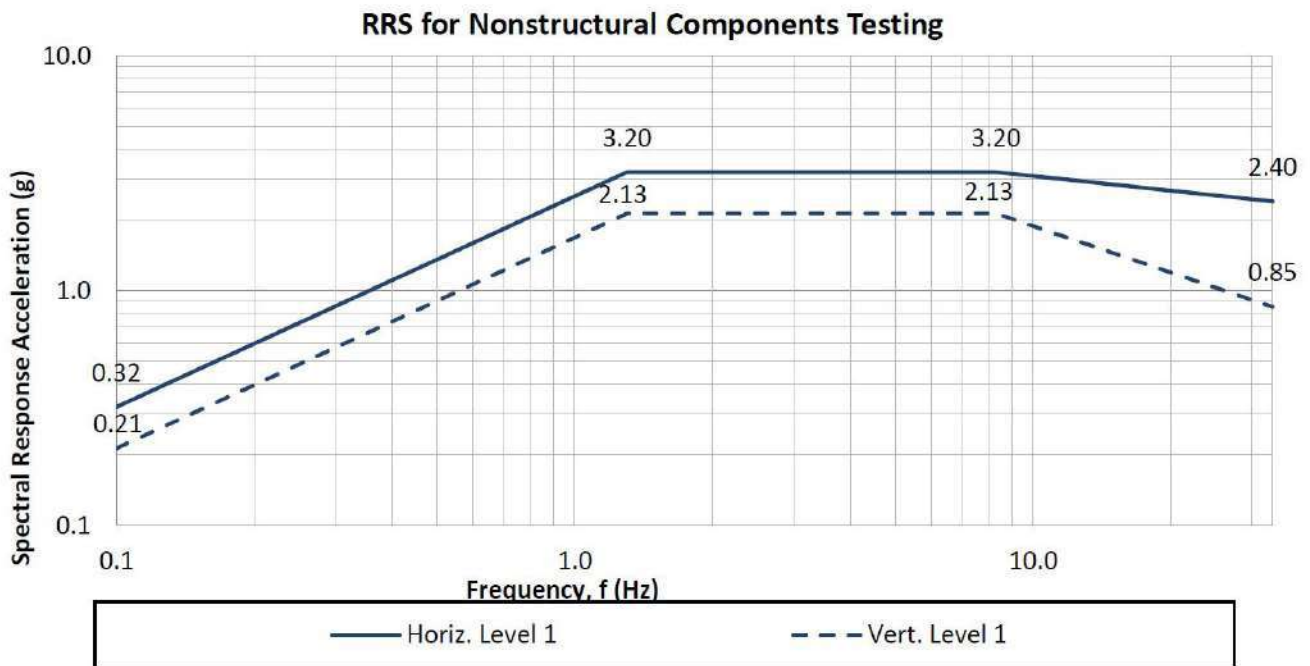


ViZiTouch V2 Operator Interface	<ul style="list-style-type: none"> • Embedded microcomputer with software PLC logic • 7.0" color touch screen (HMI technology) • Upgradable software • Multi-language 			
Communication Protocol Capability	<ul style="list-style-type: none"> • Protocol: Modbus • Connection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

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



Seismic Certification	Seismic Certification Company	TRU Compliance, LLC A Tobalski Watkins Affiliate					TWEI Project No.: 2100139 - CR - 001				
	Mounting details	Rigid base and wall mounting									
	Seismic Information	Building Code	Test Criteria	Seismic Parameters	S_{DS}	z/h	I_p	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
	IBC 2018, CBC 2019	ICC-ES AC156	ASCE Standard 7 - Section 13.2	2.0 3.2	1.0 0.0	1.5 1.5	3.20	2.40	2.13	0.85	



Notes:

- Components are tested in accordance with ICC-ES AC156, IBC 2018 & CBC 2019.
- OSHPD (OSP) Seismic Certification Preapproval.



A4	Flow switch provision
A8	Foam pump application w/o pressure transducer and run test solenoid valve.
A9	Low zone pump control function
A10	Middle zone pump control function
A11	High zone pump control function
A13	Non-pressure actuated controller w/o pressure transducer and run test solenoid valve
A16	Lockout/interlock circuit from equipment installed inside the pump room
B11	Built in alarm panel (120V.AC supervisory power) providing indication for: • Audible alarm & silence pushbutton for motor run, phase reversal, loss of phase. • Pilot lights for loss of phase & supervisory power available
B11B	Built in alarm panel same as B11 but 220-240VAC supervisory power
B19A	High motor temperature c/w thermostat relay and alarm contacts (DPDT)
B19B	High motor temperature c/w PT100 relay and alarm contacts (DPDT)
B21	Ground fault alarm detection c/w visual indication and alarm contact (DPDT)
C1	Extra motor run alarm contact (DPDT)
C4	Periodic test alarm contact (DPDT)
C6	Low discharge pressure alarm contact (DPDT)
C7	Low pump room temperature alarm contact (DPDT)
C10	Low water reservoir level alarm contact (DPDT)
C11	High electric motor temperature alarm contact (DPDT)
C12	High electric motor vibration c/w visual indication and alarm contact (DPDT)
C14	Pump on demand / automatic start alarm contact (DPDT)
C15	Pump fail to start alarm contact (DPDT)
C16	Control voltage healthy alarm contact (DPDT)
C17	Flow meter valve loop open c/w visual indication and alarm contact (DPDT)
C18	High water reservoir level c/w visual indication and alarm contact (DPDT)

C19	Emergency start alarm contact (DPDT)
C20	Manual start alarm contact (DPDT)
C21	Deluge valve start alarm contact (DPDT)
C22	Remote automatic start alarm contact (DPDT)
C23	Remote manual start alarm contact (DPDT)
C24	High pump room temperature alarm contact (DPDT)
C25	Second set of standard alarm contacts (DPDT) (Typical for city of Los Angeles and Denver)
Cx	Additional visual and alarm contact (Specify function) (DPDT)
D1	Low suction pressure transducer for fresh water rated at 0-300PSI with visual indication and alarm contact
D1A	Low suction pressure transducer for sea water rated at 0-300PSI with visual indication and alarm contact
D5	Pressure transducer and run test solenoid valve for fresh water rated for 0-500PSI (for factory calibration purposes only)
D5D	Pressure transducer and run test solenoid valve for sea water rated for 0-500PSI
D10	Omit mounting feet (when applicable)
D13	High withstand rating for: • 200V to 208V @ 150HP max. = 150kA* • 200V to 208V @ 200HP = 100kA* • 220V to 240V @ 200HP max. = 150kA* • 220V to 240V @ 250HP = 100kA* • 380V to 415V @ 300HP max. = 150kA* • 380V to 415V @ 350HP to 450HP = 100kA* • 440V to 480V @ 400HP max. = 150kA* • 440V to 480V @ 450HP to 500HP = 100kA* • 600V @ 500HP max. = 100kA*
D13A	High withstand rating for: • 380V to 480V = 65kA* • 600V = 25kA*
D13B	High withstand rating for: • 200V to 208V @ 150HP max. = 200kA* • 220V to 240V @ 200HP max. = 200kA* • 380V to 415V @ 300HP max. = 200kA* • 440V to 480V @ 400HP max. = 200kA*
D14	Anti-condensation heater & thermostat
D14A	Anti-condensation heater & humidistat
D14B	Anti-condensation heater & thermostat & humidistat

*For fire pump controller section only.

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



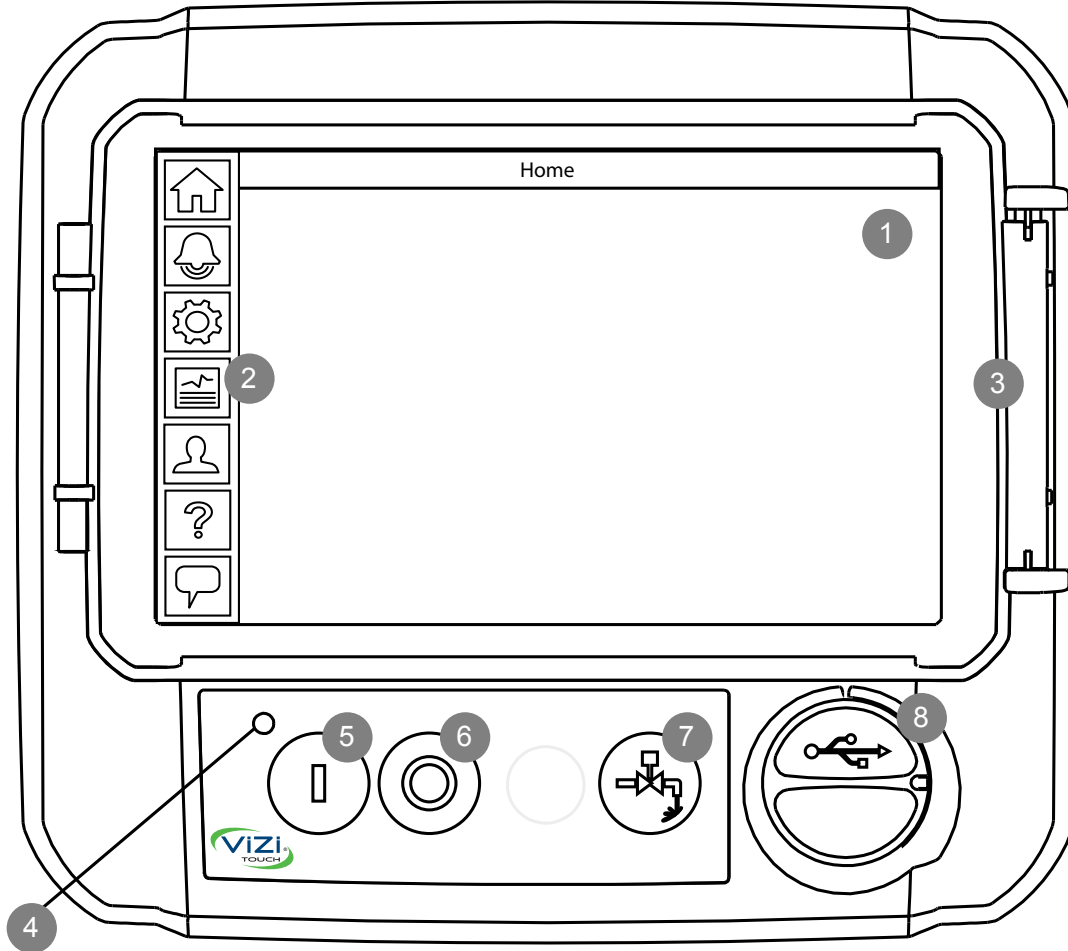
D15	Tropicalization
D18	CE Mark with factory certificate
D26	Modbus with RTU frame format and RS485 connection
D27	Motor heater connection (external single phase power source and heater on/off contact)
D27A	Motor heater connection (internal single phase power source and heater on/off contact)
D28	Customized drawing set
D34A	Field programmable I/O board - 5 Input / 5 output

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

Additional Options:

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

ViZiTouch V2 Operator Interface



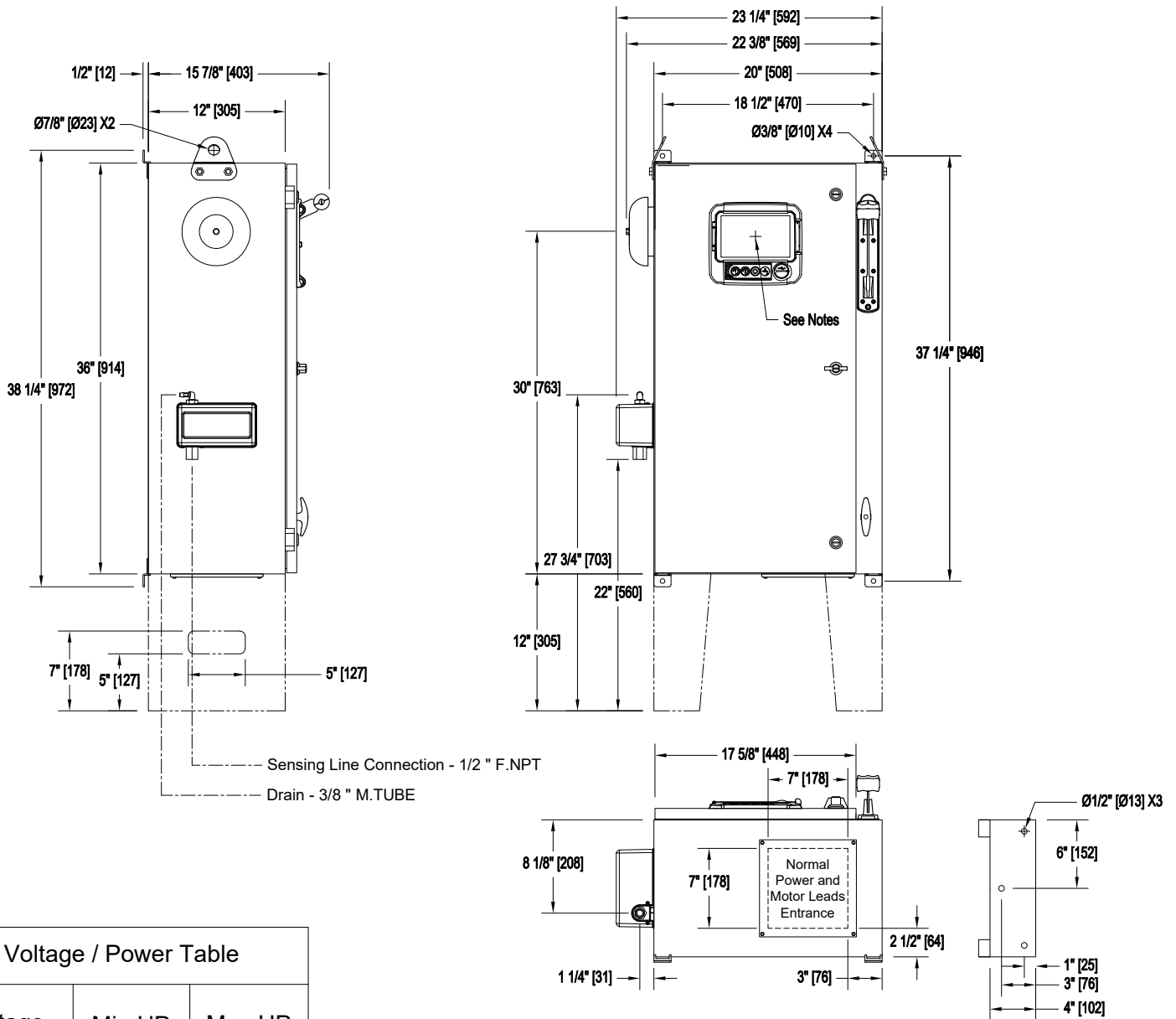
- | | |
|------------------------|--------------------------|
| 1 - Color touch screen | 3 - Screen protector |
| 2 - Onscreen menu | 4 - Power LED (3 colors) |
| • HOME page | 5 - START button |
| • ALARM page | 6 - STOP button |
| • CONFIGURATION page | 7 - RUN TEST button |
| • HISTORY page | 8 -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

Electric Fire Pump Controller

Model: GPA/GPP/GPY

Dimensions

Built to the latest edition of the NFPA 20 standard

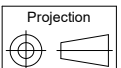


Voltage / Power Table		
Voltage	Min HP	Max HP
208	5	30
220 - 240	5	30
380 - 400 - 415	5	60
440 - 480	5	60
600	5	75

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.
- Seismic mounting to be rigid wall and base only.

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



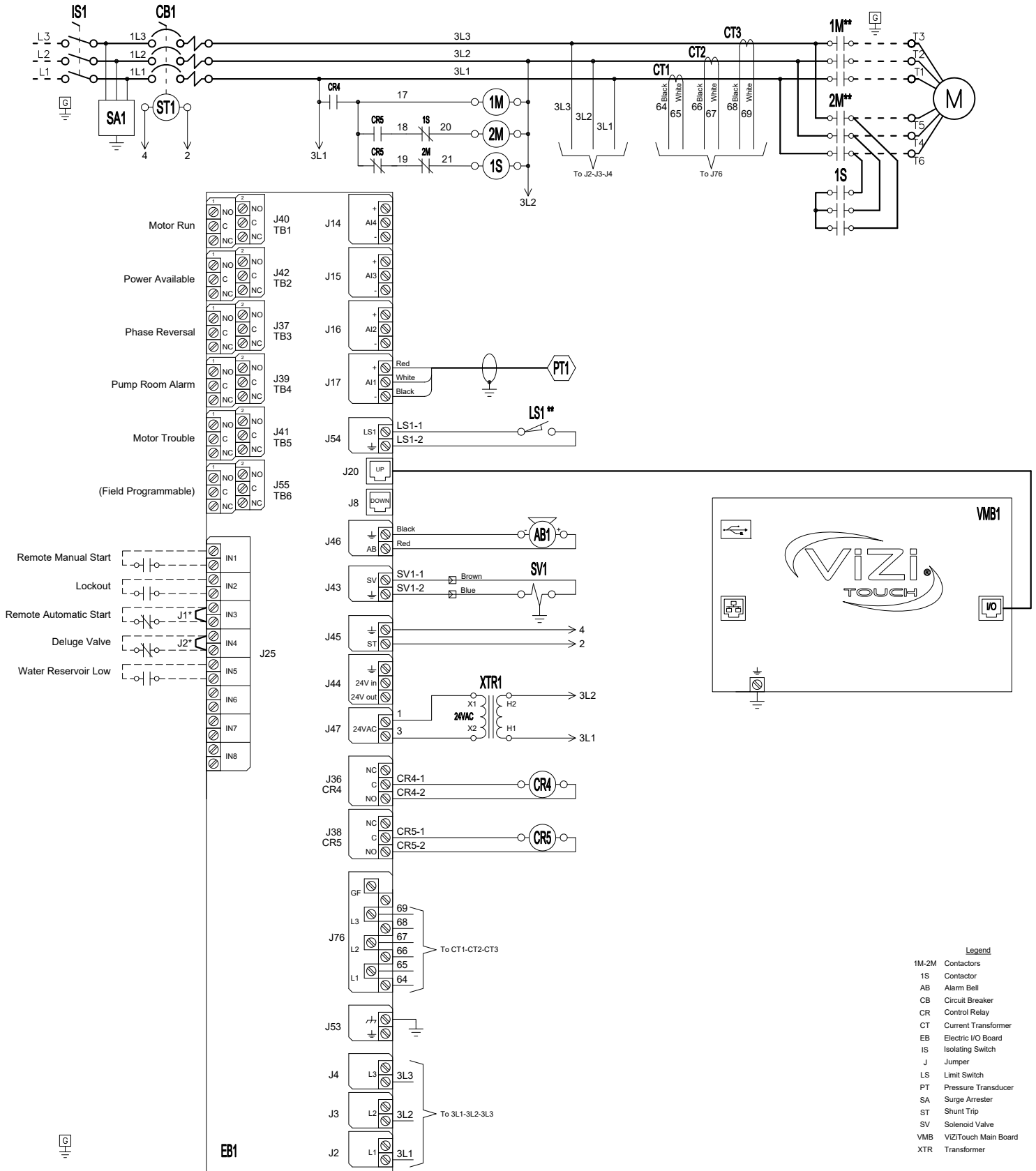
REV.	DESCRIPTION	DD/MM/YY	Drawing number
2.	Revised logo	18/06/18	GPX-DI161 / E
1.	Valve Change	21/11/17	
0.	First issue	16/11/16	

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

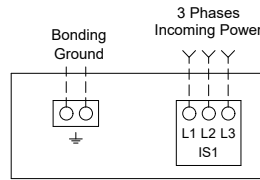
Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.

- Legend**
- 1M-2M Contactors
 - 1S Contactor
 - AB Alarm Bell
 - CB Circuit Breaker
 - CR Control Relay
 - CT Current Transformer
 - EB Electric I/O Board
 - IS Isolating Switch
 - J Jumper
 - LS Limit Switch
 - PT Pressure Transducer
 - SA Surge Arrester
 - ST Shunt Trip
 - SV Solenoid Valve
 - VMB VIZITouch Main Board
 - XTR Transformer



REV.	DESCRIPTION	DD/MM/YY	Drawing number
2	Update Logo	23/04/18	GPY-WS600 /E
1	Removed (fail safe) text from Power Available relay	20/02/17	
0	First issue	10/11/16	

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	5	7.5	10	15	20	25	30	40	50
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	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	5	7.5	10	15	20	25	30	40	50
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 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
208	2x (2/0 to 500)	2x (4/0 to 500)	2x (300 to 500)	2x (350 to 500)	3x (300 to 500)	-----	-----	-----	-----	-----	-----	-----
220 to 240	1x (350)** 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)** N/A	2x (3/0 to 500)	2x (4/0 to 500)	2x (300 to 500)	2x (500)	3x (300 to 500)** 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)** 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.

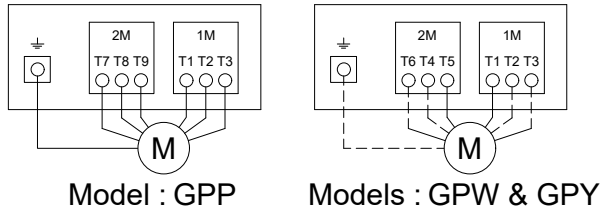
Drawing for information only.
Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.

** Consult Factory



REV.	DESCRIPTION	DD/MM/YY	Drawing number
0	First issue	22/12/20	GPX-TD612 1/2 /E

Motor 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 Motor Connection (1M-2M).

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

HP 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 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 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 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
0	First issue	22/12/20	GPX-TD612 2/2 /E

Electric Fire Pump Controller

Model: GPX

Terminal Diagram and Sizing

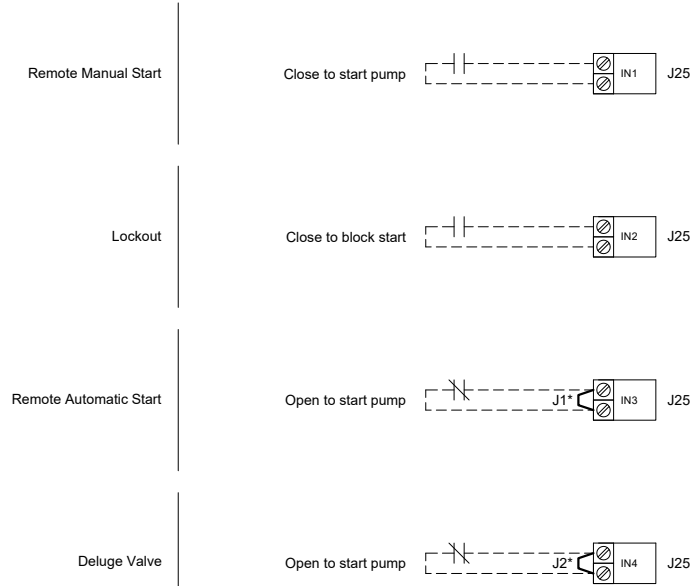
Built to the latest edition of the NFPA 20 standard

Control Terminals (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm

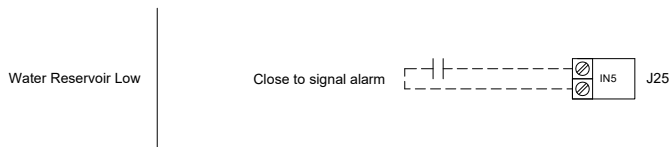
Remote Alarm Terminals (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



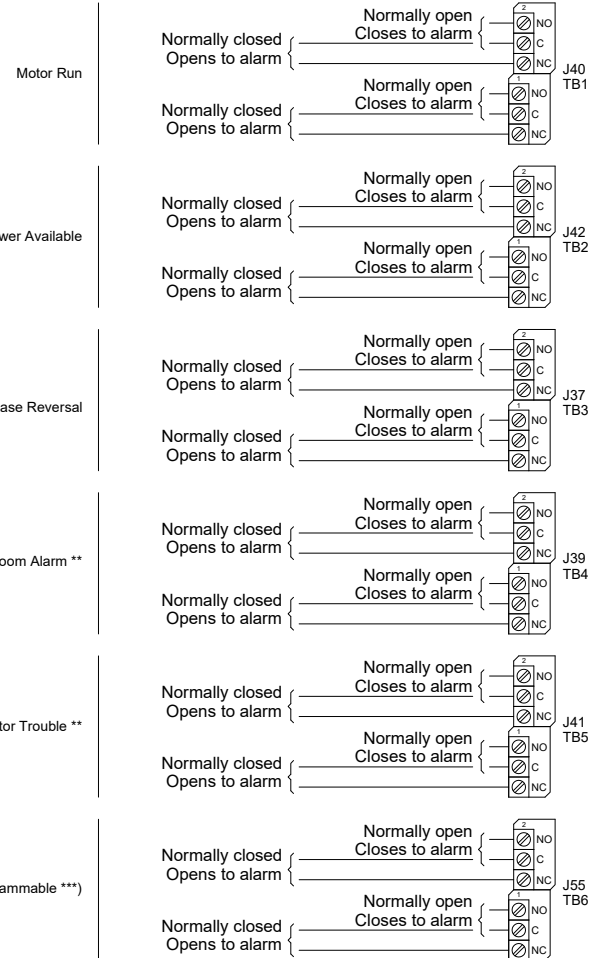
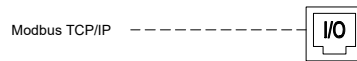
Alarm Inputs (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Network Connection (VMB1)

Shielded Female Connector RJ45



* 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.



REV.	DESCRIPTION	DD/MM/YY	Drawing number
2	Revised logo	18/06/18	GPX-TD603 /E
1	General Revision (added AL coverage)	10/07/17	
0	First issue	16/03/17	

Diesel Pump



SECTION B

Diesel DRIVEN PUMP

B.1. Pump Base (UL Listed & FM Approved):

Fairbanks Nijhuis Fire pumps:

- Horizontal Splitcase 2-1/2"-1823BF
- Flow: 250 GPM
- Pressure rated: 115 Psi
- Speed: 3000 RPM
- Shut Off pressure: 120 Psi

Pump Construction:

- Material of construction: Cast Iron casing.
- Impeller Material: Bronze
- Pump rotation: Right handed
- Flange rating (Suction/Discharge): 125/125 LB (3"/2.5")
- Pump base: Structural Steel base.
- Shaft Material: Carbon Steel AISI C1045

B.2. Diesel Engine (UL listed & FM Approved):

- Manufacturer: Clarke
- Model: KA4H-UFKA34
- Horsepower: 50 HP
- Speed: 3000 RPM,
- Voltage: 12V.
- Cooling Method: Heat Exchanger

B.3. Pump Controller (UL Listed/FM Approved):

- Manufacturer: Tornatech GPD
- Voltage: 230 Volt AC
- Enclosure: NEMA 2

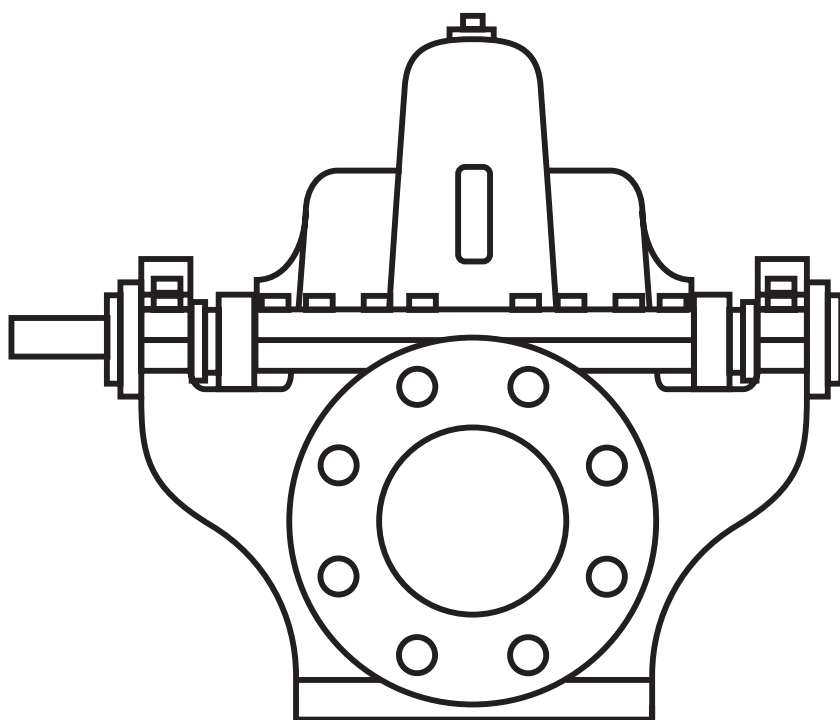
B.4. Pump Accessories:

- Air release valve.
- 2 Pressure gauges for suction & discharge.
- Main relief valve: 3" valve, Pilot operated, 125 lb.
- Enclosed waste cone: 3X5 waste cone.
- Flow meter: 4" Global Vision Venturi Flow Meter, 250 GPM Grooved.

B.5. Diesel Engine Accessories:

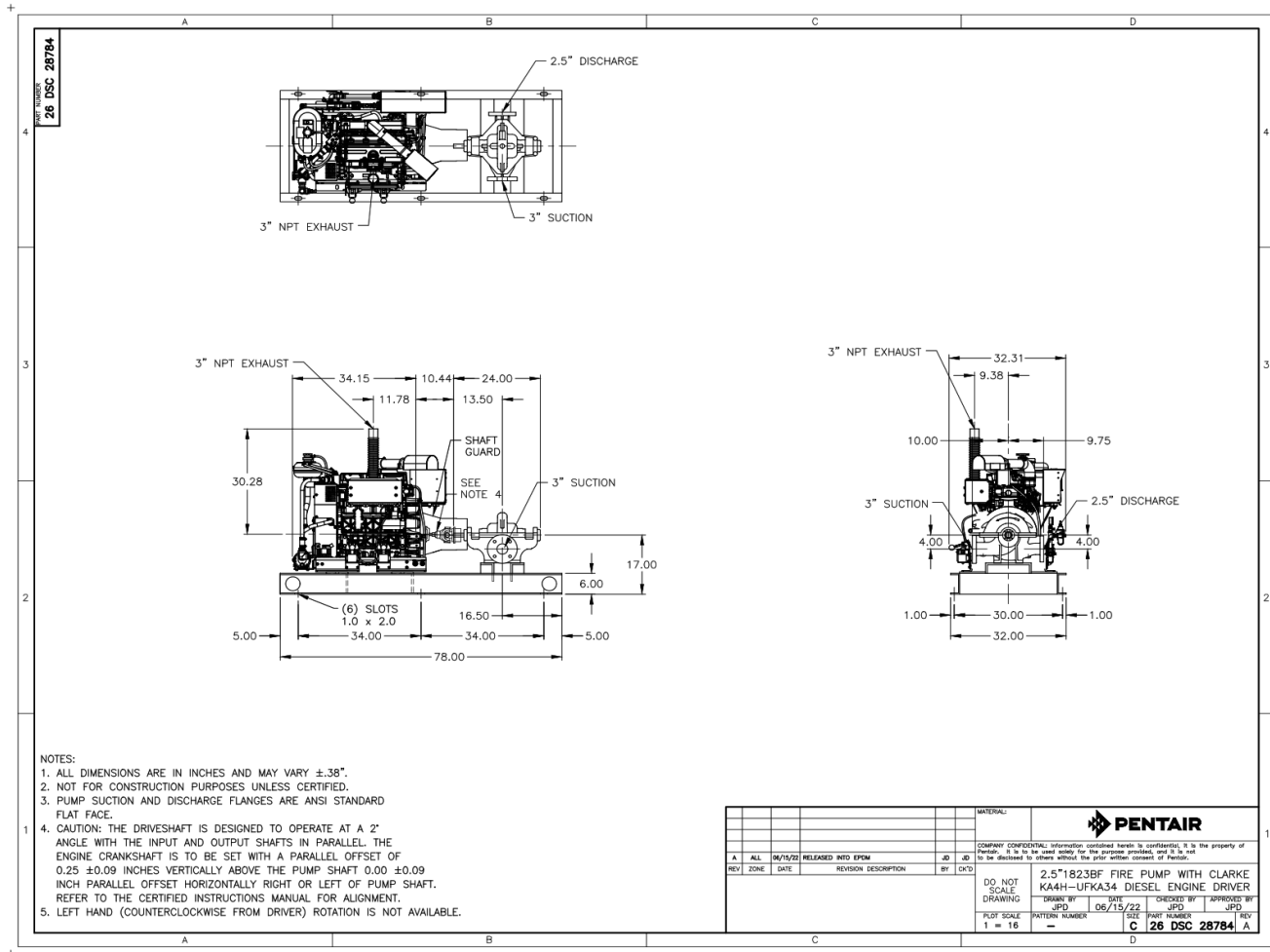
- Muffler: Commercial Grade, 3"
- **UL Listed** Fuel tank and fuel tank fittings (**As per NFPA 20**): 119 US gallon tank, 105 usable US gallons, Single Wall
- 2 batteries: 12 V

(Dimensions & Curves)



General Arrangement

WARNING
 DO NOT OPERATE THIS MACHINE WITHOUT PROTECTIVE GUARD IN PLACE. ANY OPERATION OF THIS MACHINE WITHOUT PROTECTIVE GUARD CAN RESULT IN SEVERE BODILY INJURY.



NOTES:

Not for construction, installation, or application purposes unless certified.

All dimensions are in mm

Dimensions may vary ± .38" (10mm) due to normal manufacturing tolerances.

Bases are designed to be completely filled with grout.

See configuration for estimated total weight.

For additional dimensions, refer to engine manufacturer's website.

Pump Data	
Series	Horizontal Splitcase
Model	2-1/2"-1823BF
Size	2.5x3x10B
Flow	250.0 USgpm
Rated Pressure	7.93 bar.g
RPM	3000 rpm
Rotation	Right handed
Liquid Type	Water
Discharge Size	63.50 mm
Suction Size	76.20 mm
Impeller Diameter	241 mm
Connection Type	Flanged
Base Type	Structural steel base
-	-

Pump Materials of Construction	
Pump	Bronze fitted with Cast Iron casing
Shaft	Carbon Steel AISI C1045

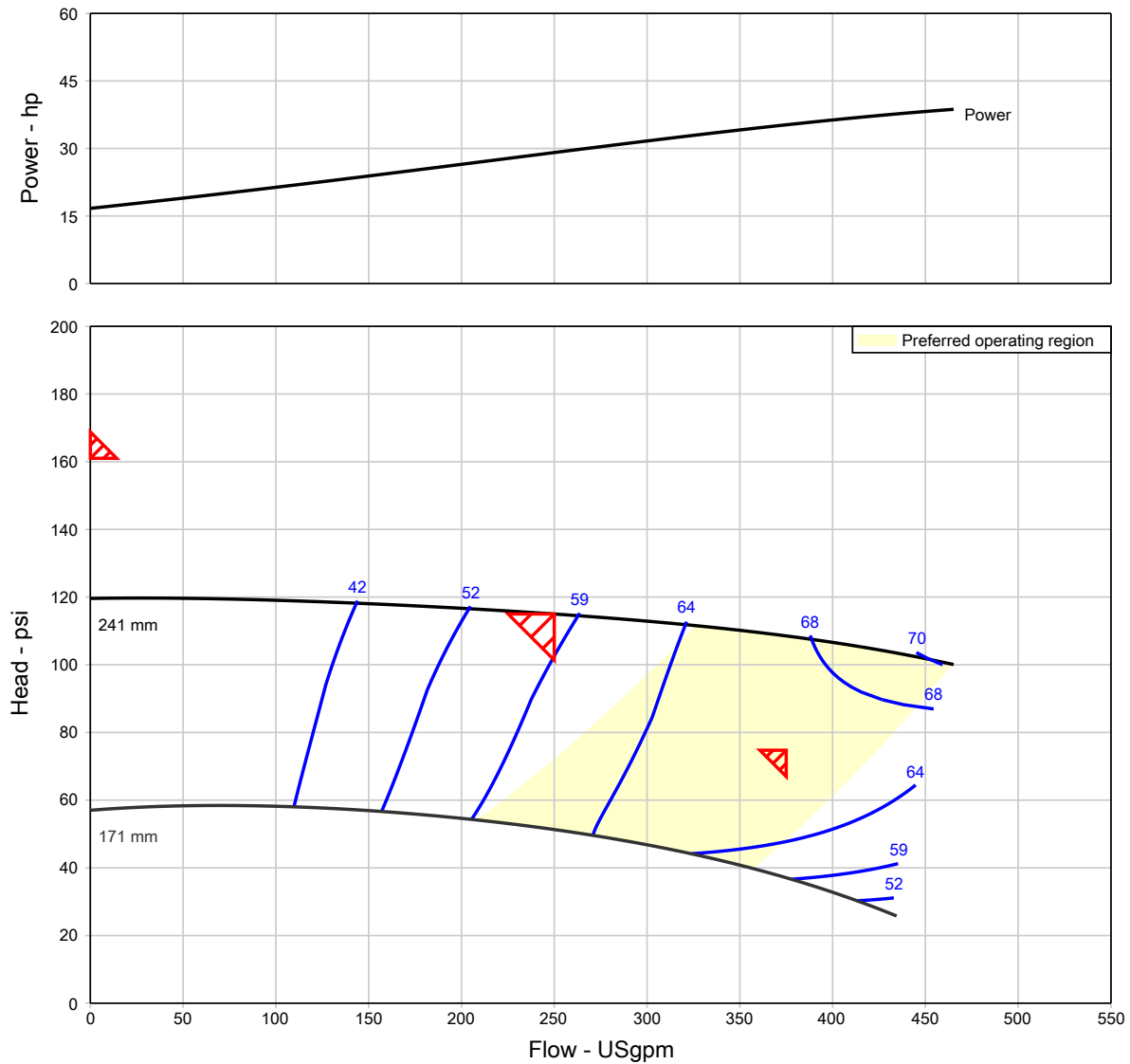
Engine Data	
Engine Model	KA4H-UFKA34
Power Rated	50.00 hp
Power Available	50.00 hp
Speed	3000 rpm
Tier	T0
Manufacturer	Clarke
Cooling Type	Heat exchanger
Heater Voltage	230 Volt
Muffler Type	Commercial Grade, 3" (Qty 1)
Exhaust Connection	NPT Flex Exhaust
Battery Type	Lead acid
Battery Voltage	12 Volt DC

Site Information	
Elevation	91.44 m
Temperature	25.00 deg C

Estimated Weights	
Pump	256.3 kg
Driver	338.4 kg

Quote Information	
Customer	EGS
Customer Quote	
Job Name	BDC New Aswan Branch BLDG
Market	-

PENTAIR	Quote Item	002
	Quote Date	



Item number	: 002	Size	: 2-1/2"-1823BF
Service	:	Stages	: 1
Quantity	: 1	Driver type	: Engine
Quote number	:	Frequency	: 50 Hz
Date last saved	:	Speed, rated	: 3000 rpm
Flow, rated	: 250.0 USgpm	Based on curve number	: 184-2.5X3X10B-2950
Differential head / pressure, rated	: 115.0 psi	Efficiency	: 57.65 %
Flange rating (suction / discharge)	: 125/125	Max working pressure, allowable	: 12.07 bar.g
Secondary Point (150% of rated flow)	: 375.0 USgpm	Shutoffhead, Typical	: 119.6 psi
Secondary Point (65% of rated head)	: 74.75 psi	Max suction pressure, allowable	: 3.82 bar.g
Max Shutoff per NFPA	: 161.0 psi	Suction pressure, max (user specified)	: 0.00 bar.g
		Pump shutoff w/ suction pressure	: 8.25 bar.g
		Power driver, minimum	: 37.00 hp

(UL Listing Certificate)



Model 2-1/2-1823BF

File Number: EX743

COMPANY

PENTAIR PUMP GROUP INC, DBA FAIRBANKS NIJHUIS

800 AIRPORT RD

NORTH AURORA, IL 60542 United States

MODEL INFO

2-1/2-1823BF

Centrifugal Fire Pumps, Split Case, Single Stage

RATING DETAILS

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)
250 (946)	3	2-1/2	51 (351)	115 (792)	2950	250 (1,723)
250 (946)	3	2-1/2	52 (358)	167 (1,151)	3560	250 (1,723)

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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(FM Approval)



Fire Pump Components | Fire Pumps | **Centrifugal Fire Pumps, Horizontal Split-Case Type (Horizontal Mounted)**

2-1/2-1823BF

Details

Category	Centrifugal Fire Pumps, Horizontal Split-Case Type (Horizontal Mounted)
Class of Work	1311 - Centrifugal Fire Pumps, Horz
Approval Standard	FM 1311 - Centrifugal Fire Pumps Split-Case Type (Axial or Radial)
Certification Type	FM Approved
Rated Capacity, (gal/min)	250
Rated Capacity, (dm³/min)	945
Rated Net Head at Rated Capacity, psi	50-115
Rated Net Head at Rated Capacity, kPa	345-795
Rated Speed, r/min	2950
Suction Inlet, dia., in.	3
Discharge Outlet, dia., in.	2 1/2
Stage(s)	1
Listing Country	United States of America

Company

Fairbanks Nijhuis, A Member of the Pentair Pump Group
 800 Airport Rd, North Aurora , Illinois 60542
 United States of America
<http://fairbanksnijhuis.com>

(Diesel Controller)





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



November 2021



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
	Seismic Certification	See page 5 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 3 <input type="checkbox"/> NEMA 3R <input type="checkbox"/> NEMA 4	<input type="checkbox"/> NEMA 4X-304 sst painted <input type="checkbox"/> NEMA 4X-304 sst brushed finish <input type="checkbox"/> NEMA 4X-316 sst painted <input type="checkbox"/> NEMA 4X-316 sst brushed finish
Accessories		Paint Specifications
<ul style="list-style-type: none"> • Bottom entry gland plate • Lifting Lugs • Keylock handle 		<ul style="list-style-type: none"> • Red RAL3002 • Powder coating • Glossy textured finish
Ambient Temperature Rating	Standard	
	<input type="checkbox"/> 4°C to 40°C / 39°F to 104°F	
	Optional	
	<input type="checkbox"/> 4°C to 55°C / 39°F to 131°F	
General	AC	<input type="checkbox"/> 120V / 1ph / 60hz <input type="checkbox"/> 208V to 240V / 1ph / 50-60hz
	DC	<input type="checkbox"/> 12VDC <input type="checkbox"/> 24VDC
	Grounding system	• Negative
	Battery chargers	<ul style="list-style-type: none"> • Two independent fully automatic • 10A continuous charge • 500mA trickle charge
Electrical Reading	<ul style="list-style-type: none"> • Battery 1 & Battery 2 voltage • Battery 1 & Battery 2 charging amperage • Charging mode 	
Pressure Reading	<ul style="list-style-type: none"> • Continuous system pressure display • Cut-in and cut-out pressure setting 	
Pressure and Event Recorder	<ul style="list-style-type: none"> • Pressure readings with date stamp • Event recording with date stamp • Under regular maintained operation, events are stored in memory for the life of the controller. • Data viewable on operator interface display screen • Downloadable by USB port to external memory device 	





Pressure sensing	<ul style="list-style-type: none"> • Pressure transducer and run test solenoid valve assembly for fresh water application • Pressure sensing connection 1/2" Female NPT • Drain connection 3/8" • Rated and calibrated for 0-500psi working pressure • Externally mounted with protective cover
Audible Alarm	4" alarm bell - 85 dB at 10ft. (3m)
Visual Indications	<ul style="list-style-type: none"> • Engine run • Main switch AUTO • Main switch in OFF • Main switch in HAND • Periodic test • Cranking Cycle • AC Power available • Pump room temperature (°F or °C)
Visual & Audible Alarms	<p>Visual only</p> <ul style="list-style-type: none"> • Pump room trouble • Pump on demand • AC Failure • Charger 1 & 2 Failure • Weak battery 1 & 2 • Battery 1 & 2 overvoltage • Loss of continuity 1 & 2 • High fuel level • Fuel tank leak • PLD low suction pressure • High raw water temperature • Low pump room temperature • Service required • ECM warning • Weekly test cut-in not reached • Check weekly test solenoid • Pressure transducer fault • Invalid Cut-In <p>Visual and Audible</p> <ul style="list-style-type: none"> • Engine trouble • Controller trouble • Engine low oil pressure • Engine high temperature • Engine low temperature • Engine overspeed • DC Failure • Battery 1 & 2 Failure • Engine fail to start • Low fuel level • ECM fault • ECM SS in Alternate Position • Fuel injection malfunction
Remote Alarm Contacts	<p>DPDT-8A-250V.AC</p> <ul style="list-style-type: none"> • Engine run • Common controller trouble <ul style="list-style-type: none"> • Charger #1 & Charger #2 failure • Pressure transducer fault • Common engine trouble <ul style="list-style-type: none"> • High engine temperature • Fail to start • Fuel injection malfunction** • ECM selector switch in alternate position*** • Battery #1 & battery #2 failure • DC failure • Loss of continuity (starter) #1 and/or #2 • PLD low suction pressure • Overspeed • Fail when running • Low oil pressure • Common pump room trouble (field re-assignable)* <ul style="list-style-type: none"> • Low fuel level • High fuel level • Fuel tank leak • Low pump room temperature • High pump room temperature • AC Failure • H-O-A selector switch in OFF or HAND • Free (field programmable)*

*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.



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

Alarm and shutdown schedule		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

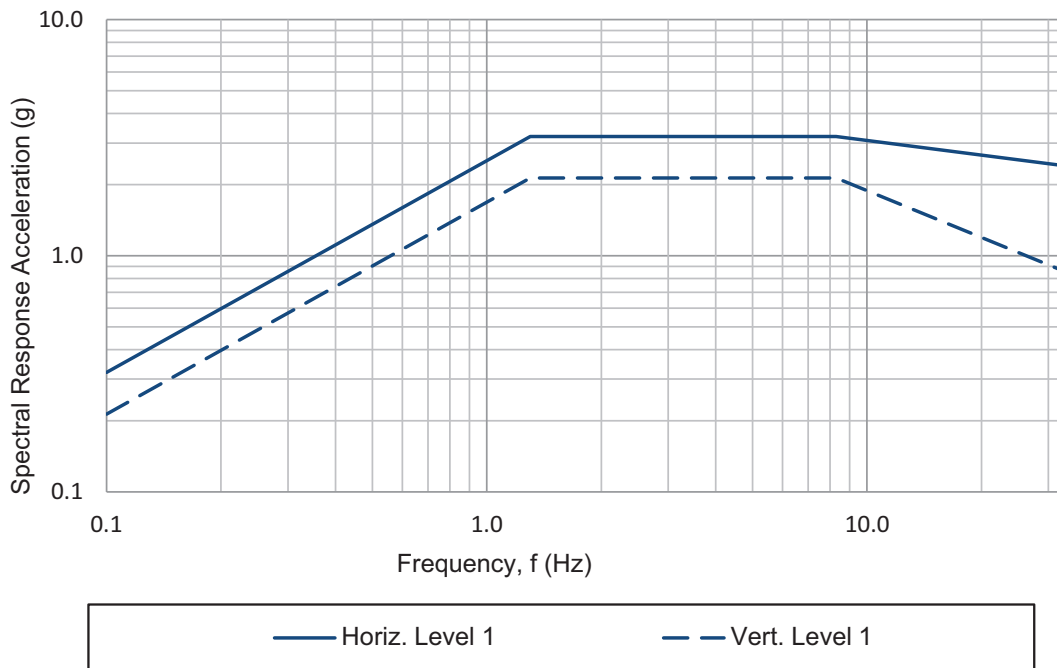
	Wall Mount		Floor Mount	
Starting Voltage	Approx. shipping dimensions in inches (mm)	Approx. Shipping Weight in Lbs (kg)	Approx. shipping dimensions in inches (mm)	Approx. Shipping Weight in Lbs (kg)
12V.DC	32" l x 29" w x 16" h (813 x 737 x 407)	85 (39)	32" l x 29" w x 26" h (813 x 737 x 661)	115 (52)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

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



Seismic Certification	Seismic Certification Company	TRU Compliance, LLC A Tobalski Watkins Affiliate					TWEI Project No.: 15014				
	Mounting details	Rigid wall mounting									
	Seismic Information	Building Code	Test Criteria	Seismic Parameters	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
	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	

RRS for Nonstructural Components Testing



Notes:

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



<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.



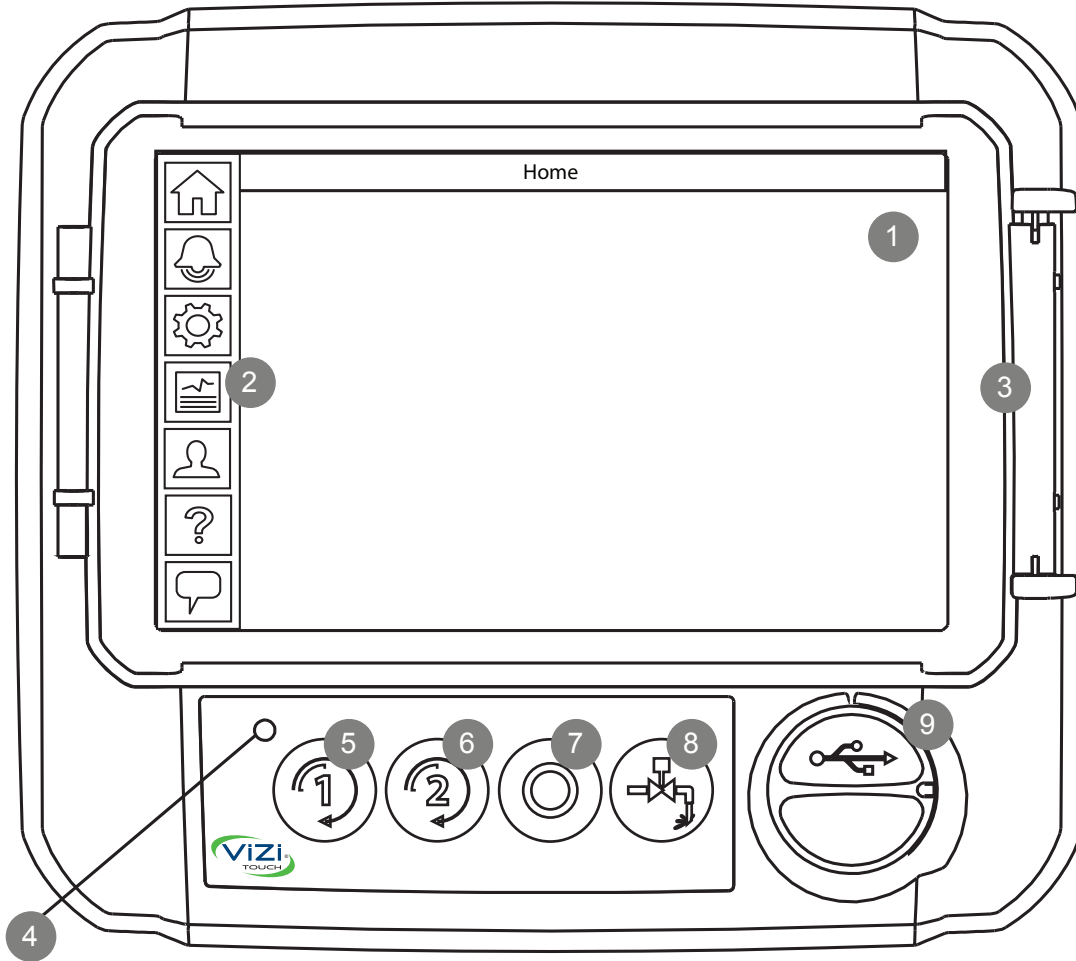
<input type="checkbox"/>	D26A	Combined low and high fuel level float switch (1-1/2")
<input type="checkbox"/>	D27	Fuel level probe (2") Level indication
<input type="checkbox"/>	D28A	Field programmable I/O board - 5 Input / 5 output
<input type="checkbox"/>	D30	Redundant pressure transducer for fresh 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"/>	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:

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 | 3 - Screen protector |
| 2 - Onscreen menu | 4 - Power LED (3 colors) |
| • HOME page | 5 - CRANK 1 button |
| • ALARM page | 6 - CRANK 2 button |
| • CONFIGURATION page | 7 - STOP button |
| • HISTORY page | 8 - RUN TEST button |
| • SERVICE page | 9 - USB port |
| • MANUAL page | |
| • LANGUAGES page | |

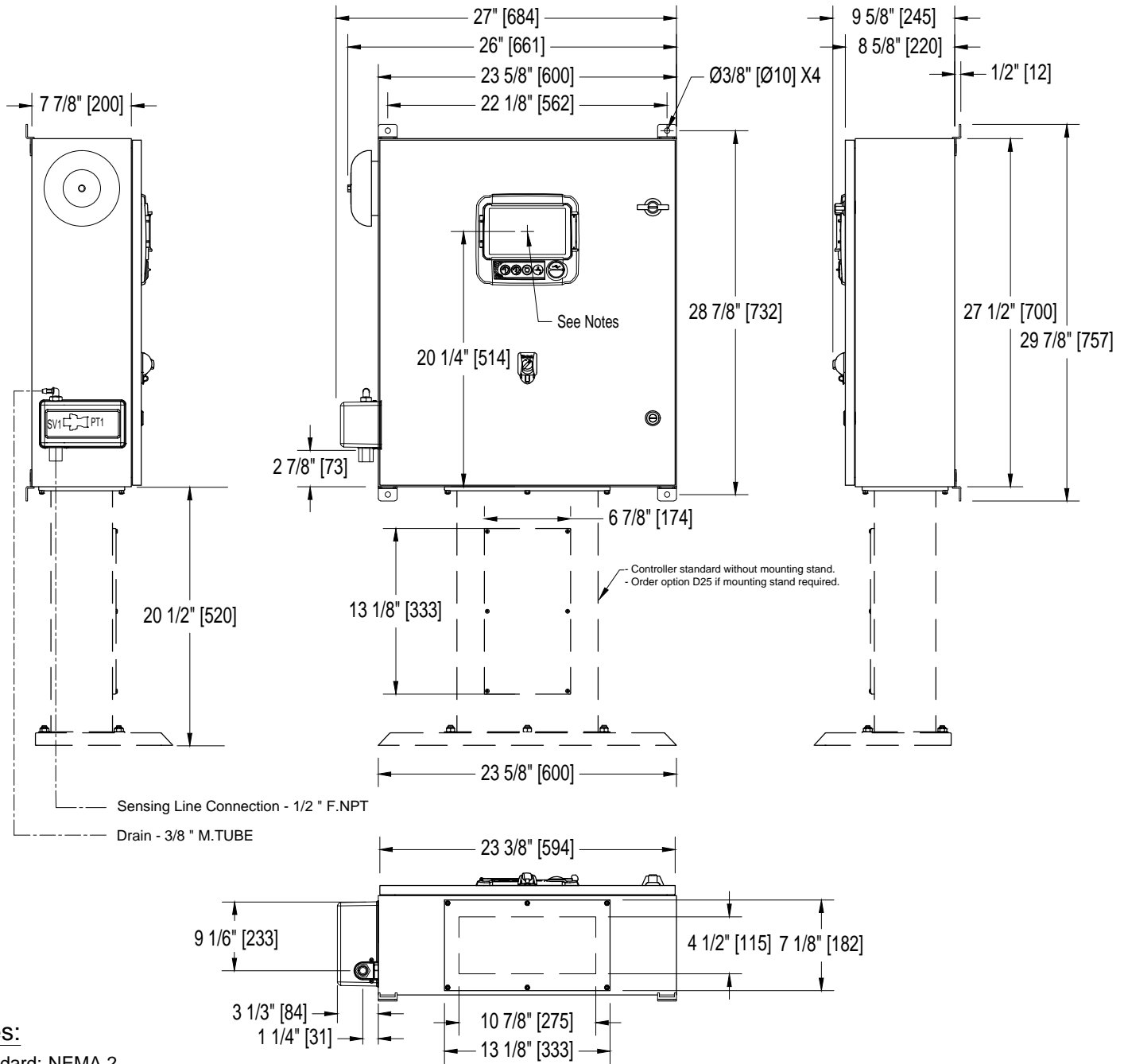
Diesel Engine Fire Pump Controller

12Vdc or 24Vdc Negative Ground

Model: GPD

Dimensions

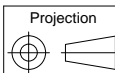
Built to the latest edition of the NFPA 20 standard



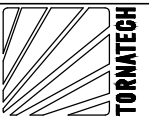
Notes:

- Standard: NEMA 2
- Standard paint : textured red RAL 3002.
- All dimensions are in inches [millimeters].
- Center of ViZiTouch 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.
- Seismic mounting to be rigid wall only.

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.	Revised logo	18/06/18	GPD-DI700 /E
0.	First issue	18/11/16	



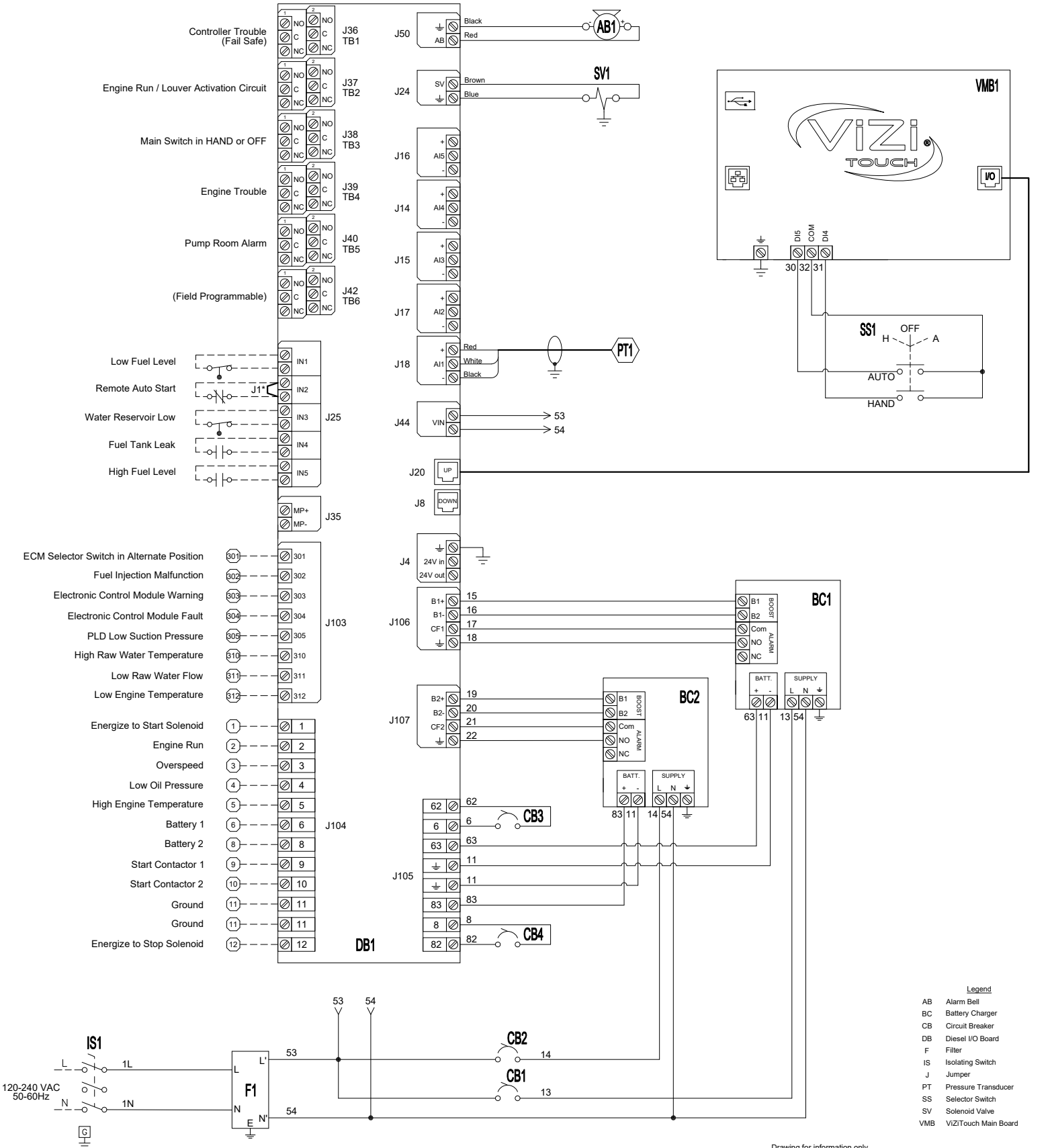
Diesel Engine Fire Pump Controller

12VDC or 24VDC Negative Ground

Wiring schematic

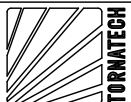
Model: GPD

Built to the latest edition of the NFPA 20 standard



* Remove jumper to use this feature

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	Water Reservoir Modified	04/04/19	GPD-WS700 /E
2	Revised logo	18/06/18	
1	Corrected SS1 inputs	16/01/17	

CAD

Diesel Engine Fire Pump Controller

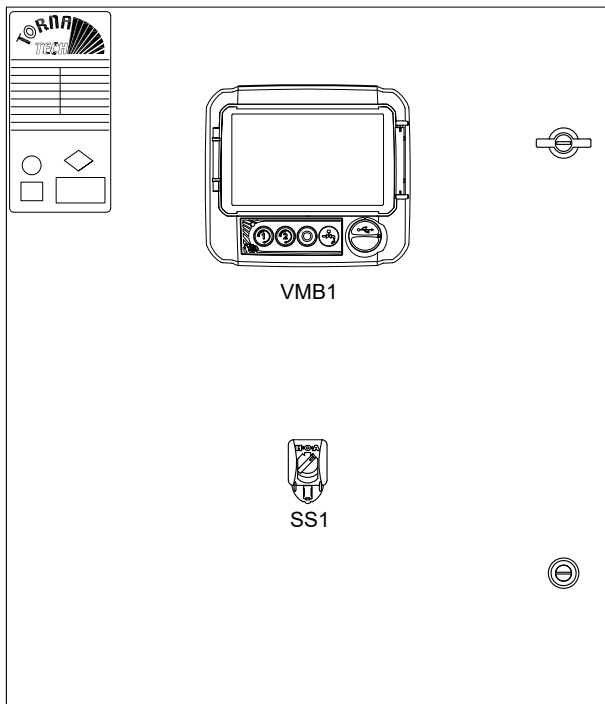
12VDC or 24VDC Negative Ground

Layout

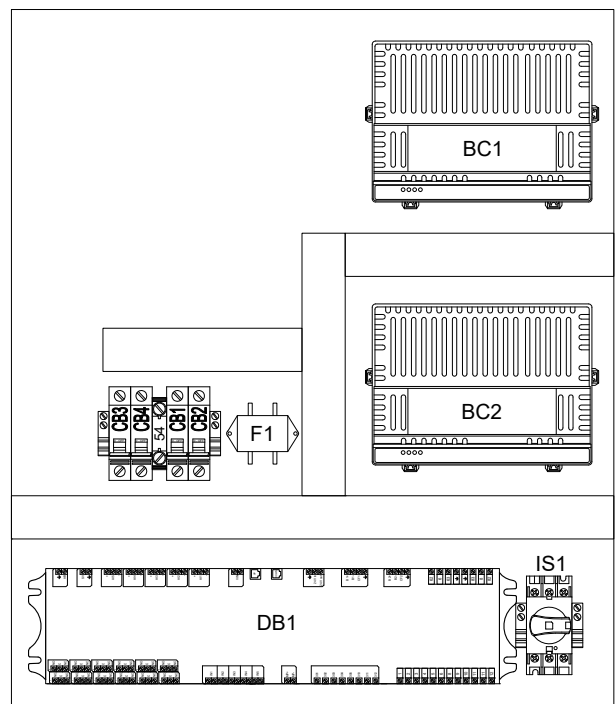
Model:GPD

Built to the latest edition of the NFPA 20 standard

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	ViZiTouch Main Board



Front Door Layout



Internal Layout



REV.	DESCRIPTION	DD/MM/YY	Drawing number
1	Revised logo	18/06/18	GPD-LY700 /E
0	First issue	21/11/16	

Diesel Engine Fire Pump Controller

12VDC or 24VDC Negative Ground

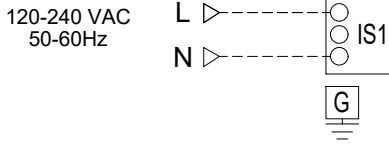
Model: GPD

Terminal Diagram

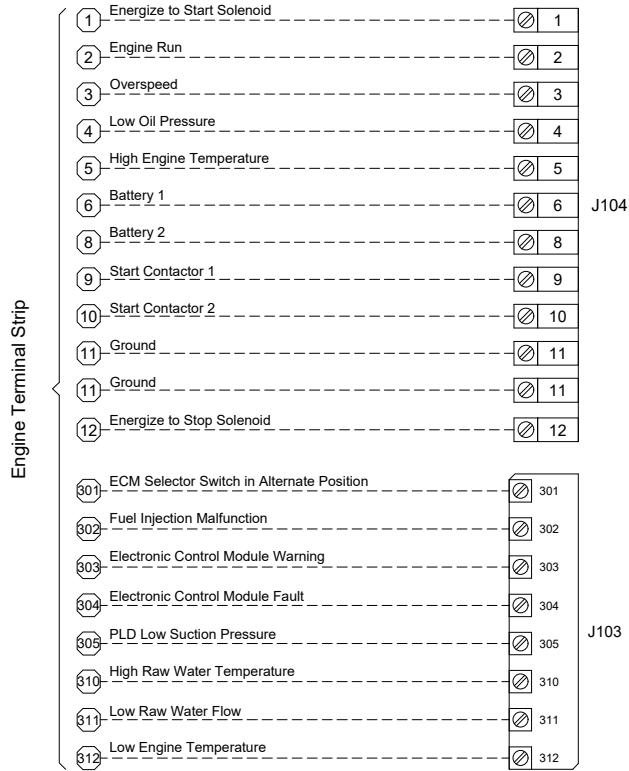
Built to the latest edition of the NFPA 20 standard

Power Supply

Terminals Wire Size:
14 - 6 AWG
3.9 Nm

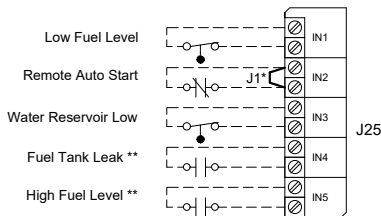


Engine Connections (DB1)



Field Connections (DB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



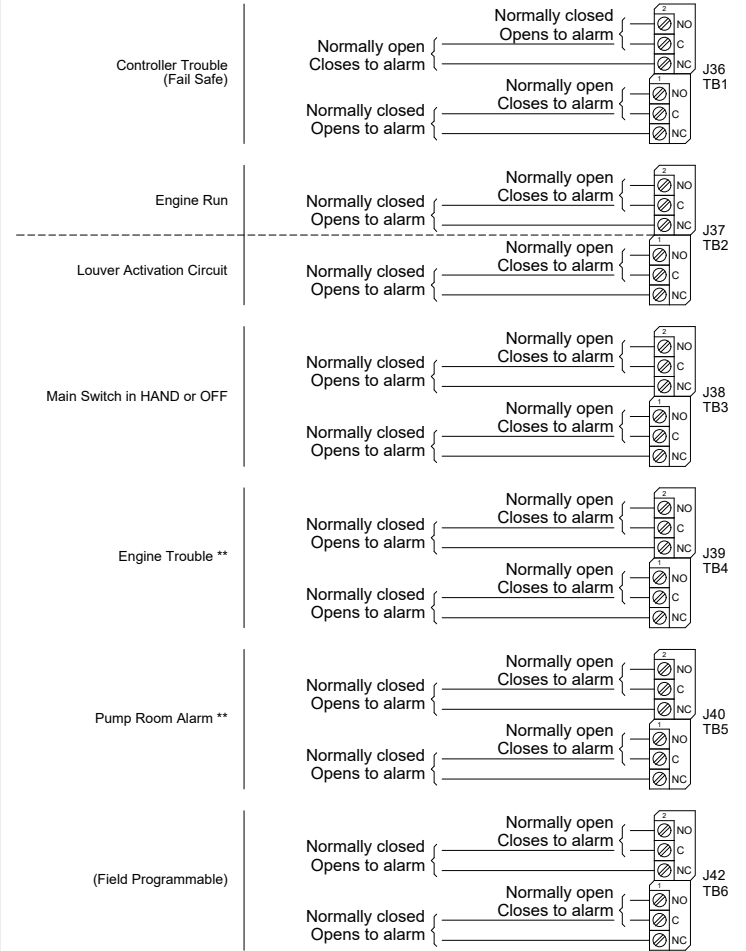
Network Connection (VMB1)

Shielded Female Connector RJ45



Remote Alarm Terminals (DB1)

Terminals Wire Size:
250VAC / 8A Max.
24 - 12 AWG
0.5 Nm



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)

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

* Remove jumper to use this feature
** Re-assignable

REV.	DESCRIPTION	DD/MM/YY	Drawing number
3	Revised text	22/07/21	GPD-TD700 /E
2	Revised IN3	22/05/19	
1	Revised logo	18/06/18	

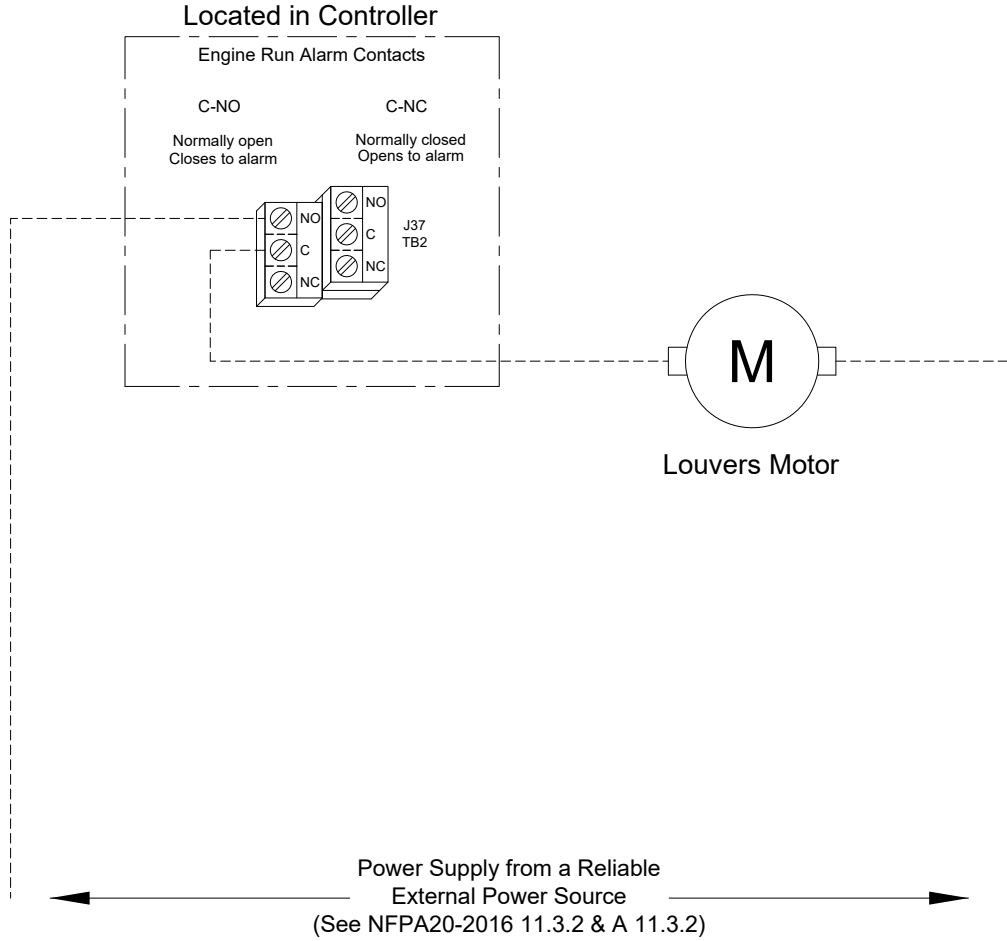
Diesel Engine Fire Pump Controller

12VDC or 24VDC Negative Ground

Model: GPD

Louver Connection

Built to the latest edition of the NFPA 20 standard



REV.	DESCRIPTION	DD/MM/YY	Drawing number
1	Revised logo	18/06/18	GPD-TD701 /E
0	First issue	10/11/16	

Jockey Pump

PVM/PVMI/PVMX VERTICAL MULTISTAGE CENTRIFUGAL PUMPS

HIGH HYDRAULIC EFFICIENCY, MOTOR DESIGNED TO EN STANDARDS

The PVM, PVMI and PVMX are non-self priming vertical multistage pump of in-line design, flange or with Victaulic coupling with equally sized suction and discharge ports.

Stage construction with stainless steel impellers, chambers and pressure casing. Pump stub shaft and motor shaft of the IEC-standards motor are directly close coupled.

All pumps are equipped with high efficiency motors (IE3) and with a cartridge type mechanical seal for easy maintenance.

PVM, PVMI and PVMX pumps have different pump sizes and various numbers of stages to provide the flow and the pressure required.



APPLICATIONS

- Water supply
- Pressure boosting systems
- Water treatment/filtration
- Irrigation
- High pressure washes
- Liquid transfer
- Firefighting systems
- Boiler feed



SECTION C

JOCKEY PUMP

C.1. Pump Base:

Pressure Maintenance Pump

- Pump type: Vertical Multistage
- JP details: PVM5-18, Stackable CI
- Flow rate: 25 GPM
- Pressure rated: 125 Psi
- Horsepower: 4 HP
- Voltage: 380 V
- Frequency: 50 Hz
- Material of Construction: Stainless Steel
- Motor enclosure: Totally Enclosed Fan Cooled-Premium Eff. Motor (TEFC)

C.2. Pump Controller (UL Listed):

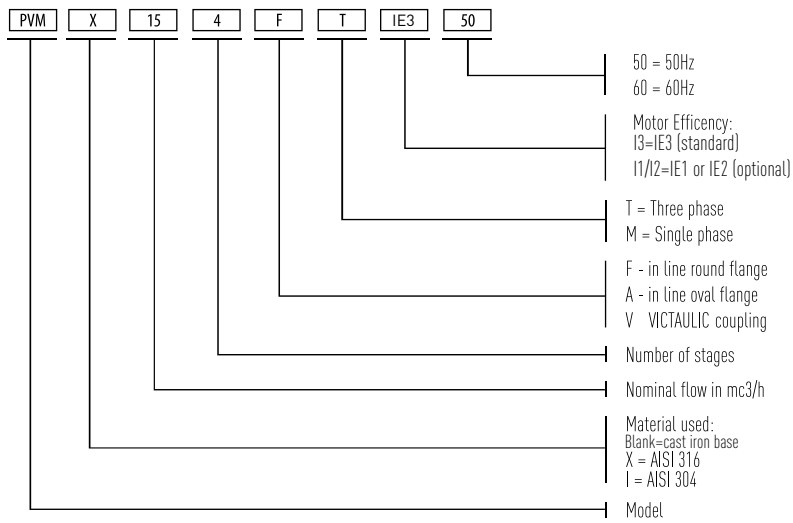
- Manufacturer: Tornatech JP3
- Voltage: 380 V
- Frequency: 50 Hz
- Horsepower: 4 HP
- Transition: Across-The-Line
- Enclosure: NEMA 2
- Minimum Run Timer.

(Dimensions & Curves)

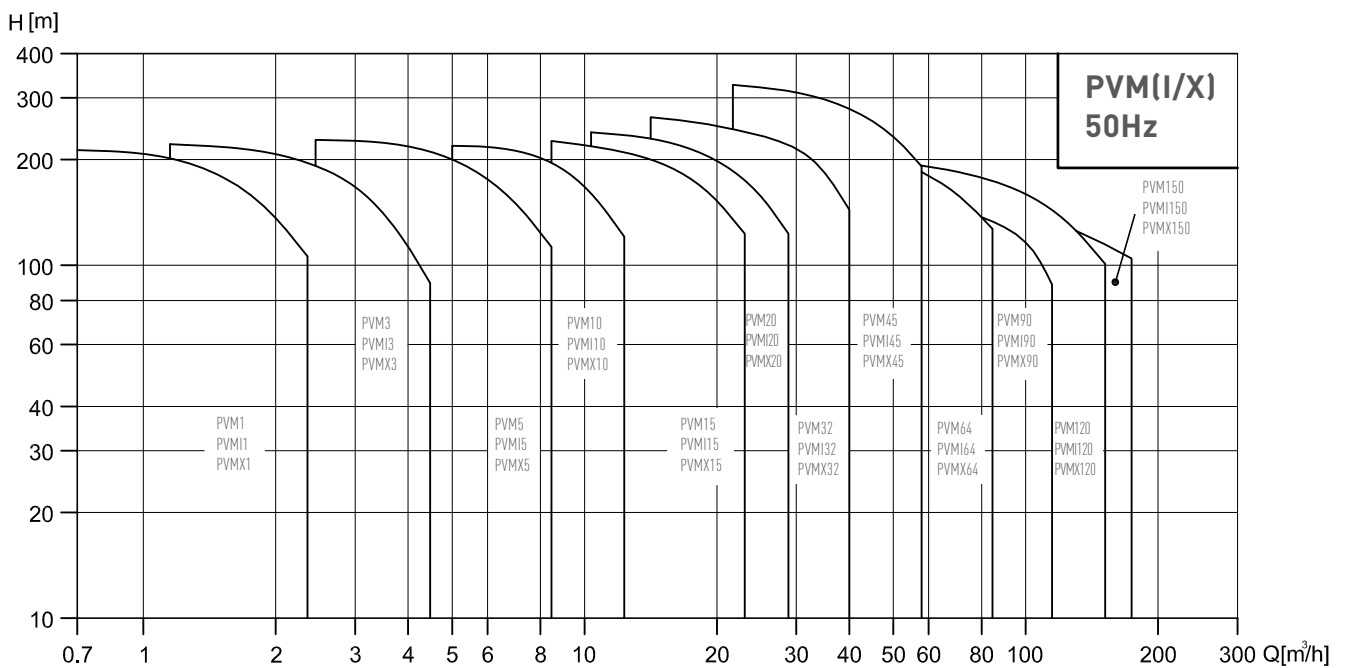
PVM/PVMI/PVMX

VERTICAL MULTISTAGE CENTRIFUGAL PUMPS

IDENTIFICATION CODE



PERFORMANCE RANGE



PVM/PVMI/PVMX

VERTICAL MULTISTAGE CENTRIFUGAL PUMPS

MOTOR

- Asynchronous electric motor with enclosed stator and external ventilation
- Main dimensions are in accordance with DIN and IEC standards
- Energy efficiency: IE3 (IE1-IE2 motors available on request)
- Class F insulation
- Level of protection IP55
- Maximum environmental temperature 50°C
- Speed of rotation 2900 rpm

MOTOR TYPE -2 POLES				NOMINAL CURRENT IN [A]		
[HP]	[KW]	Flange	Frame	3~230V	3~400V	
0.5	0.37	B14	71	1,9	1,1	
0.75	0.55		71	2,7	1,6	
1	0.75		80	3,5	2,1	
1.5	1.1		90S	5,2	3,0	
2	1.5		90L	5,2	3,0	
3	2.2		90L	8,0	4,6	
4	3		100L	9,7	5,6	
5.5	4		112M	12,2	7,0	
					3~400V	3~690V
7.5	5.5	B5	132S	10,0	5,8	
10	7.5		132S	13,1	7,6	
					3~690V	3~400V
15	11		160M	19,7	11,4	
20	15		160M	26,7	15,5	
25	18.5		160L	33,0	19,1	
30	22		180M	40,8	23,7	
40	30		200L	52,8	30,6	
50	37		200L	65,6	38	
60	45		225M	82,4	47,8	
75	55		250M	93,6	54,3	
100	75		280S	123,1	71,4	

* The Nominal Current values indicated refer to a standard motor configuration.
For detailed information, please contact your country's Pentair office

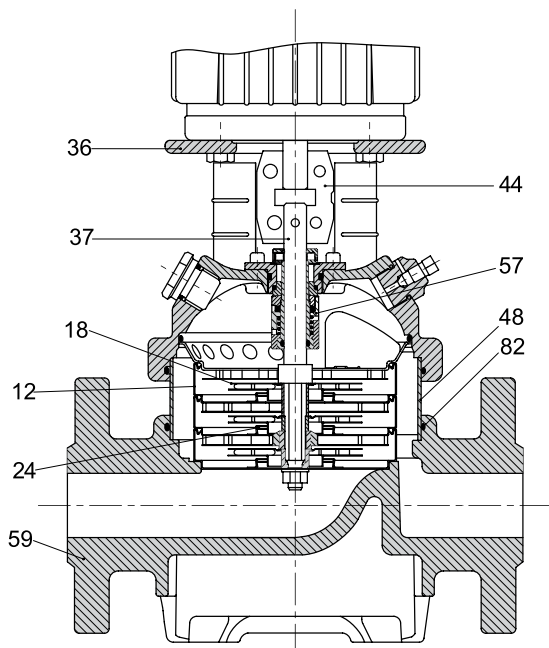
PVM/PVMI/PVMX

VERTICAL MULTISTAGE CENTRIFUGAL PUMPS

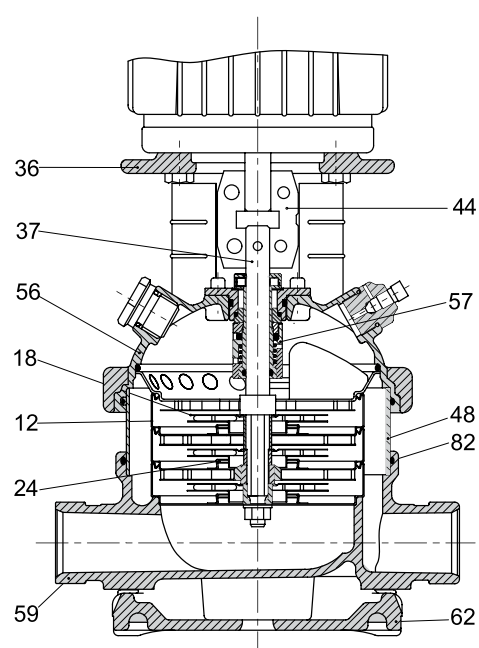
PUMP CONSTRUCTION

POS.	NAME	MATERIAL	PVM 1, 3, 5, 10, 15, 20	PVMI 1, 3, 5, 10, 15, 20	PVMX 1, 3, 5, 10, 15, 20
36	Pump head	Cast Iron	EN-GJL-200 ; ASTM 25B	EN-GJS-450-10 ; ASTM 65-45-12	EN-GJS-450-10 ; ASTM 65-45-12
56	Pump head cover	Stainless Steel	N/A	1.4301 ; AISI 304	1.4401 ; AISI 316
18	Impeller	Stainless Steel	1.4301 ; AISI 304	1.4301 ; AISI 304	1.4401 ; AISI 316
37	Shaft	Stainless Steel	1.4057 ; AISI 431	1.4057 ; AISI 431	1.4401 ; AISI 316
48	Outer sleeve	Stainless Steel	1.4301 ; AISI 304	1.4301 ; AISI 304	1.4401 ; AISI 316
82	O-Ring for outer sleeve	EPDM	-	-	-
12	Chamber	Stainless Steel	1.4301 ; AISI 304	1.4301 ; AISI 304	1.4401 ; AISI 316
24	Neck Ring	PTFE	-	-	-
59	Base	Cast Iron	EN-GJL-200 ; ASTM 25B	N/A	N/A
		Stainless Steel	N/A	1.4301 ; AISI 304	1.4401 ; AISI 316
62	Base plate	Cast Iron	N/A	EN-GJL-200 ; ASTM 25B	EN-GJL-200 ; ASTM 25B
44	Coupling	Fe-Cu-C	SINT C11 ; MPIF FC0525	SINT C11 ; MPIF FC0525	SINT C11 ; MPIF FC0525
57	Mechanical seal	Cartridge type	-	-	-

PVM - 1, 3, 5, 10, 15, 20



PVMI / X - 1, 3, 5, 10, 15, 20

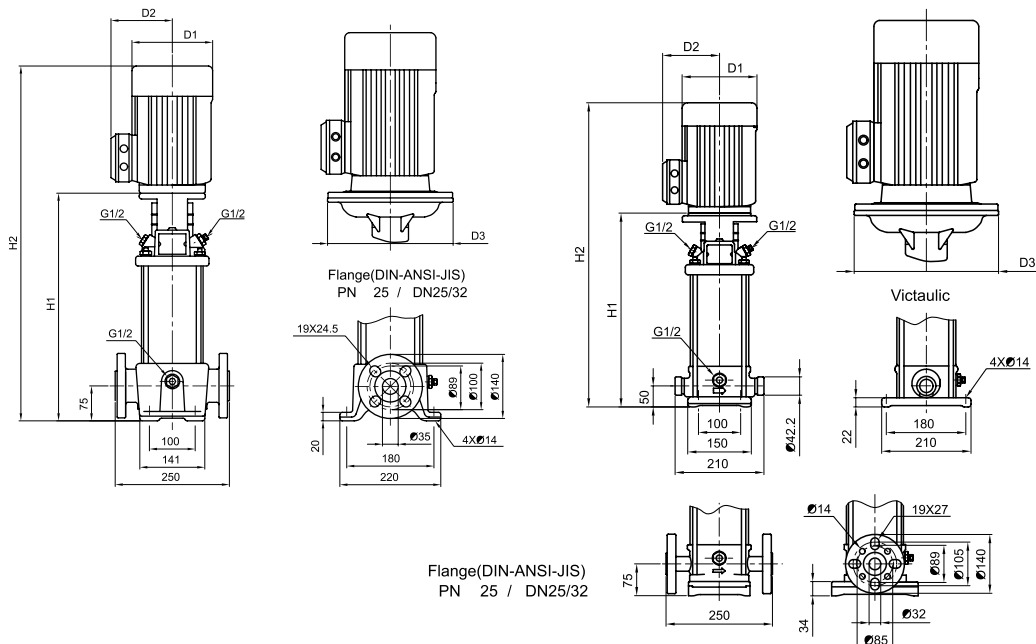


PVM/PVMI/PVMX 5

VERTICAL MULTISTAGE CENTRIFUGAL PUMPS

PUMP DIMENSIONS

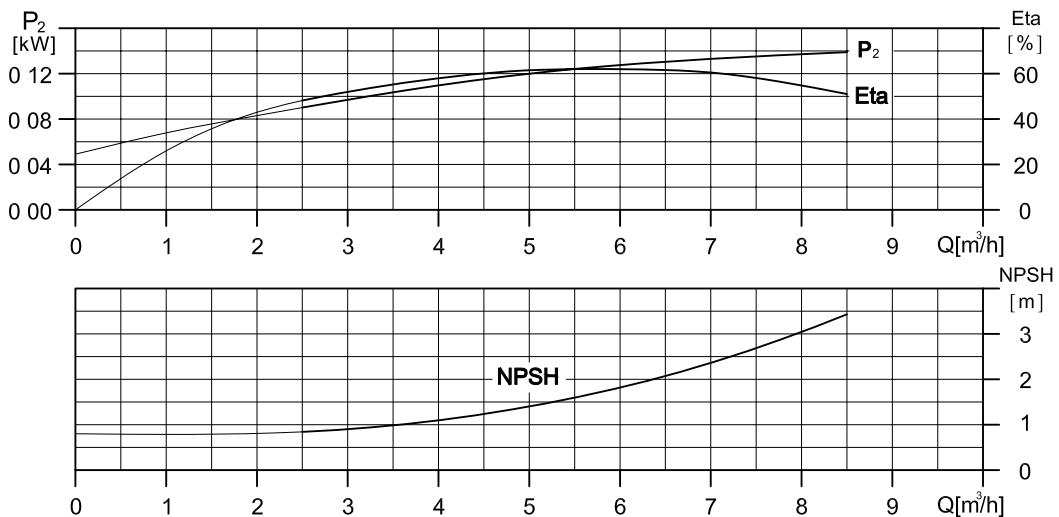
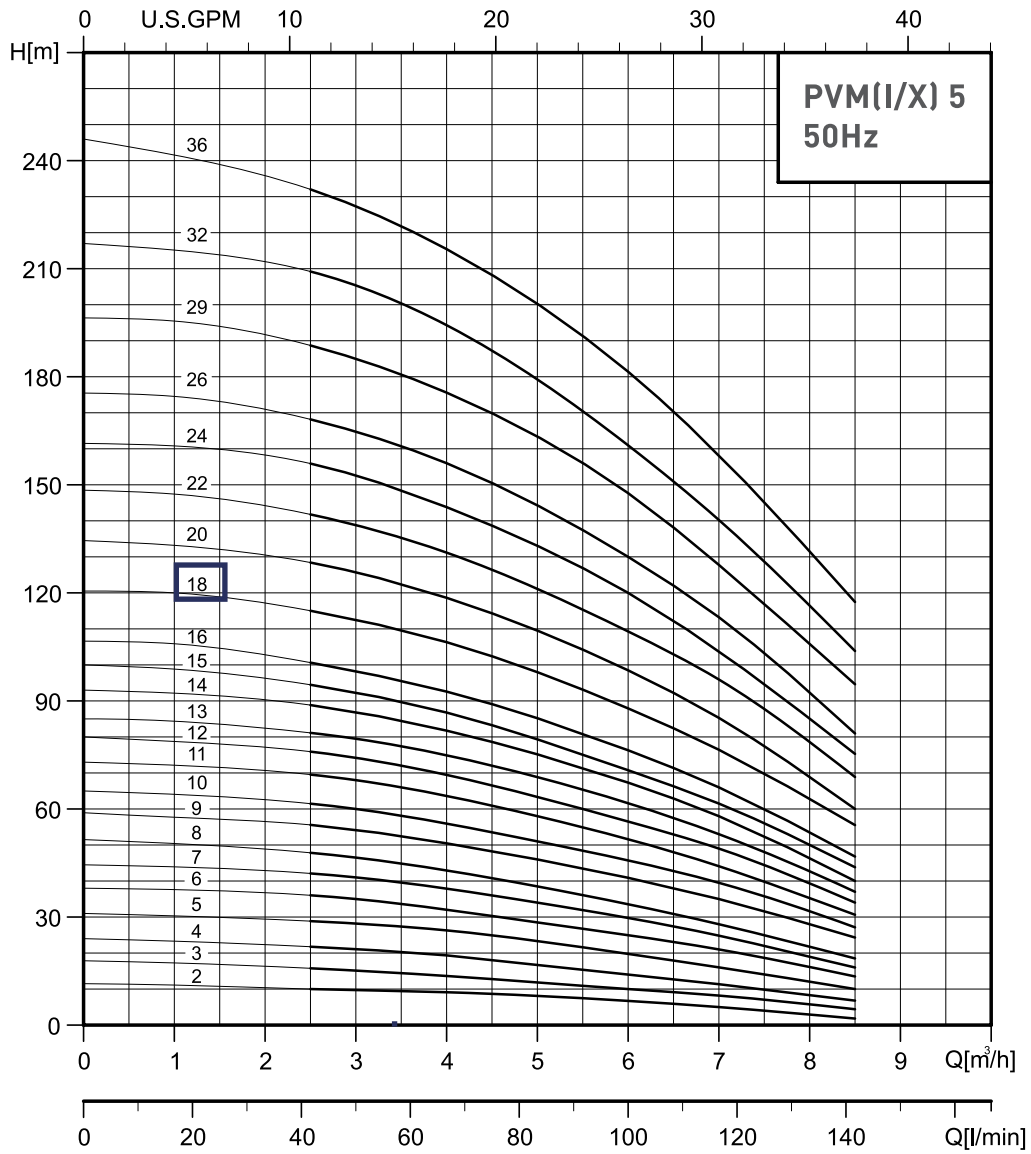
PUMP TYPE	MOTOR		PVM						PVMI - PVMX								
			DIMENSION [mm]				Net Weight [kg]	DIMENSION [mm]					Net Weight [kg]				
	P ₂		DIN Flange		D1	D2		D3	DIN Flange	Victaulic		D1		D2	D3	Victaulic	DIN Flange
	[HP]	[KW]	H1	H2			H1			H2	H1		H2				
PVM 5-2	0,5	0,37	279	474	141	115	—	23,3	257	452	282	477	141	115	—	19,2	20,1
PVM 5-3	0,75	0,55	306	501	141	115	—	24,2	284	479	309	504	141	115	—	20,3	21,2
PVM 5-4	0,75	0,55	333	528	141	115	—	24,8	311	506	336	531	141	115	—	20,8	21,8
PVM 5-5	1,0	0,75	366	601	141	115	—	27,4	344	579	369	604	141	115	—	23,4	24,3
PVM 5-6	1,5	1,1	393	628	141	115	—	29,1	371	606	396	631	141	115	—	25,1	26,0
PVM 5-7	1,5	1,1	420	655	141	115	—	29,6	398	633	423	658	141	115	—	25,6	26,5
PVM 5-8	1,5	1,1	447	682	141	115	—	30,1	425	660	450	685	141	115	—	26,1	27,1
PVM 5-9	2,0	1,5	490	757	180	138	—	39,3	468	759	493	760	180	138	—	35,4	36,4
PVM 5-10	2,0	1,5	517	784	180	138	—	39,9	495	786	520	787	180	138	—	36,0	36,9
PVM 5-11	3,0	2,2	544	811	180	138	—	43,2	522	813	547	814	180	138	—	39,3	40,3
PVM 5-12	3,0	2,2	571	838	180	138	—	43,7	549	840	574	841	180	138	—	39,9	40,8
PVM 5-13	3,0	2,2	598	865	180	138	—	44,2	576	867	601	868	180	138	—	40,4	41,4
PVM 5-14	3,0	2,2	625	892	180	138	—	44,8	603	894	628	895	180	138	—	41,0	41,9
PVM 5-15	3,0	2,2	652	919	180	138	—	45,2	630	921	655	922	180	138	—	41,5	42,5
PVM 5-16	3,0	2,2	679	946	180	138	—	45,8	657	948	682	949	180	138	—	42,1	43,0
PVM 5-18	4,0	3,0	737	1058	194	145	—	54,3	715	1031	740	1061	194	145	—	50,3	51,3
PVM 5-20	4,0	3,0	791	1112	194	145	—	55,5	769	1085	794	1115	194	145	—	51,6	52,5
PVM 5-22	5,5	4,0	845	1173	225	160	—	59,8	823	1149	848	1176	225	160	—	55,8	56,8
PVM 5-24	5,5	4,0	899	1227	225	160	—	60,8	877	1203	902	1230	225	160	—	56,9	57,8
PVM 5-26	5,5	4,0	953	1281	225	160	—	62,7	931	1257	956	1284	225	160	—	58,0	58,9
PVM 5-29	5,5	4,0	1034	1362	225	160	—	64,6	1012	1338	1037	1365	225	160	—	59,7	60,6
PVM 5-32	7,5	5,5	1145	1510	248	194	300	90,1	1123	1485	1148	1513	248	194	300	84,9	85,8
PVM 5-36	7,5	5,5	1253	1618	248	194	300	92,6	1231	1593	1256	1621	248	194	300	87,1	88,1



PVM/PVMI/PVMX 5

VERTICAL MULTISTAGE CENTRIFUGAL PUMPS

HYDRAULIC PERFORMANCE



Head and NPSH values valid with water density $\rho = 1.0 \text{ Kg / dm}^3$ at 20° C

PVM(I/X) 5	2900 rpm	50 Hz	ISO 9906 - Annex A
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MEI ≥ 0.4 - MEI reference ≥ 0.70 - The reference efficiency information is available on the website: www.europump.org/efficiencycharts

(Jockey Controller)





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

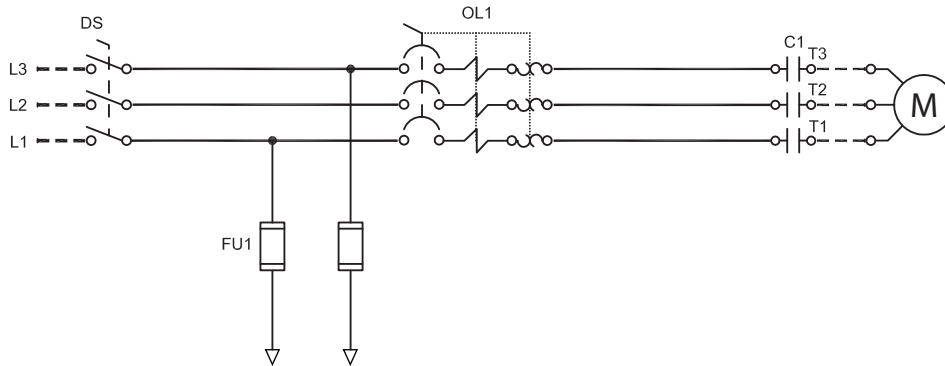
Note: The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.



N.Y.C.
APPROVED



March 2020



N.Y.C.
APPROVED



OPTIONAL



Listing	Underwriters Laboratory (UL)	UL508A - Industrial Pump Controllers
	CSA	CSA C22.2 No. 14 Industrial Control Equipment
	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 3 <input type="checkbox"/> NEMA 3R <input type="checkbox"/> NEMA 4	<input type="checkbox"/> NEMA 4X-304 sst painted <input type="checkbox"/> NEMA 4X-304 sst brushed finish <input type="checkbox"/> NEMA 4X-316 sst painted <input type="checkbox"/> NEMA 4X-316 sst brushed finish
Accessories		Paint Specifications
• Wall mounting lugs (x4)		• Red RAL3002 • Powder coating • Glossy textured finish

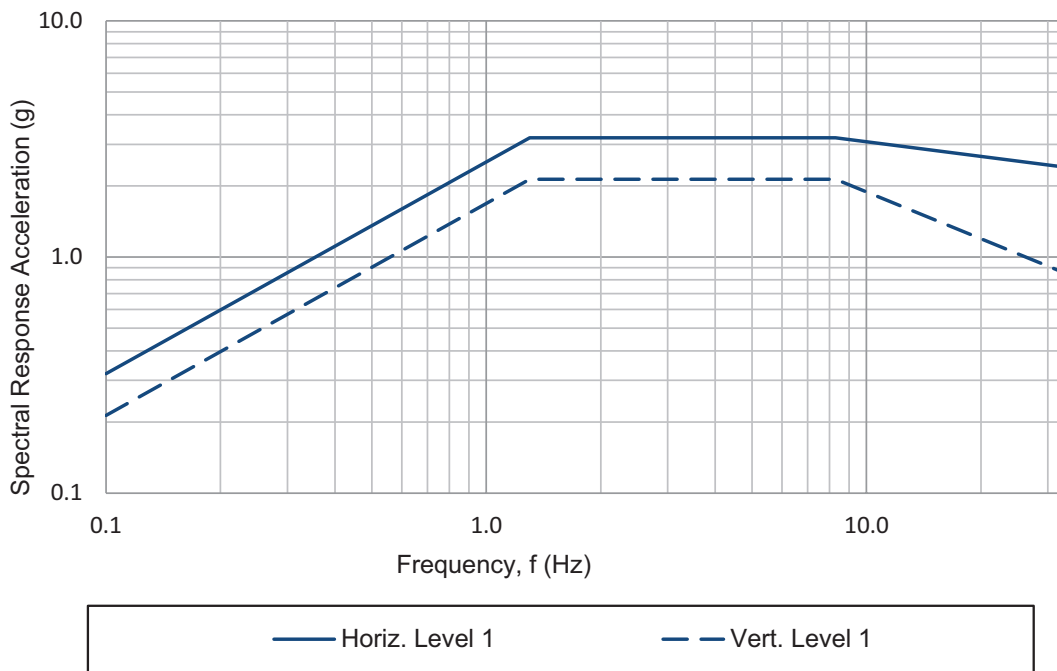


Fuseless Motor Starter	<ul style="list-style-type: none"> • Main disconnect – padlockable – rotary type handle – door interlocked • Thermo-magnetic motor protector • Contactor 		
Control Circuit	<ul style="list-style-type: none"> • 24V.AC 		
iPD+ Operator Interface	<ul style="list-style-type: none">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



Seismic Certification	Seismic Certification Company	TRU Compliance, LLC A Tobalski Watkins Affiliate					TWEI Project No.: 15014				
	Mounting details	Rigid wall mounting									
	Seismic Information	Building Code	Test Criteria	Seismic Parameters	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
		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	

RRS for Nonstructural Components Testing



Notes:

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

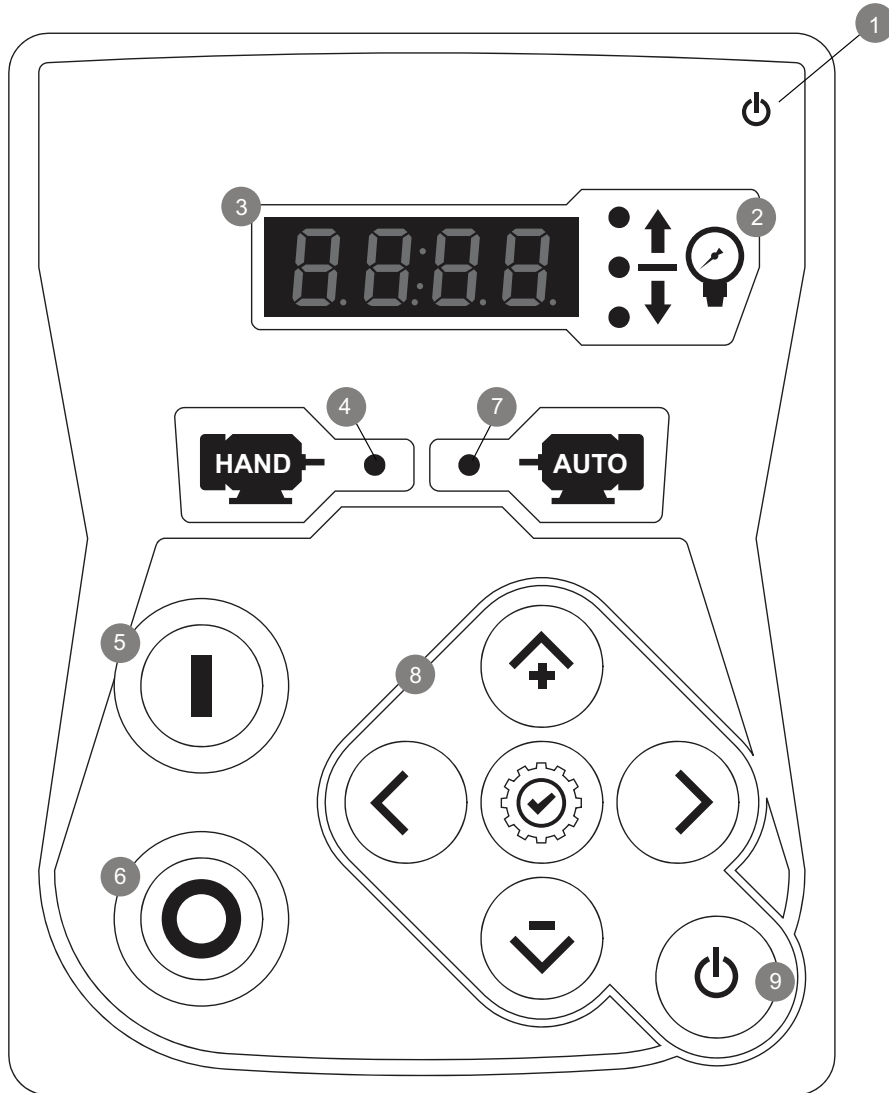


<input type="checkbox"/> A4	Elapsed time meter (time totalizer)
<input type="checkbox"/> A5	Motor run alarm contact
<input type="checkbox"/> A6	Loss of power alarm contact
<input type="checkbox"/> A7	Overload or short circuit alarm contact
<input type="checkbox"/> D11D	Pressure transducer 0-600psi with 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: • 120V/1ph (0.5hp max.) • 240V/1ph (1hp max.) • 200V-208V - 60hz (2hp max.) • 220V-240V - 60hz (3hp max.) • 380V-416V - 50hz - 60hz (5hp max.) • 440V-480V - 60hz (5hp max.)
<input type="checkbox"/> D33	Service entrance rated - 65kA short circuit withstand rating: • 120V/1ph (0.5hp max.) • 240V/1ph (1hp max.) • 200V-208V - 60hz (3hp-15hp max.) • 220V-240V - 60hz (5hp-15hp max.) • 380V-416V - 50hz - 60hz (7.5hp - 40hp max.) • 440V-480V - 60hz (7.5hp-40hp max.)
<input type="checkbox"/> D34	Service entrance rated - 42kA short circuit withstand rating: • 600V - 60hz (7.5hp max.)

<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

Built to the latest edition of the UL 508A & CSA C22.2 No.14 standard

PER QUOTE DRAWING No.

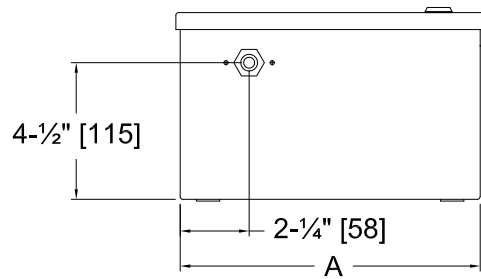
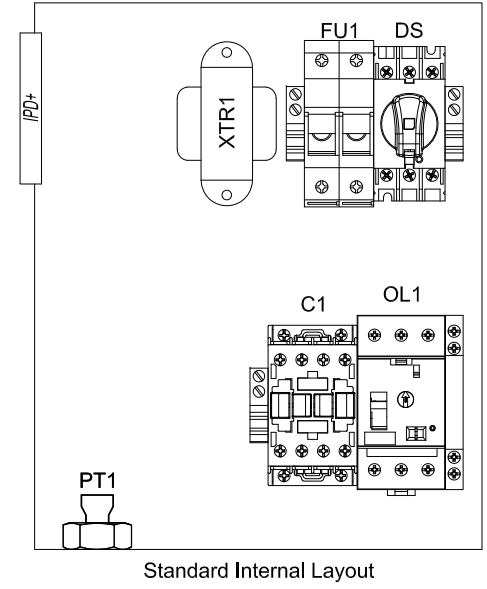
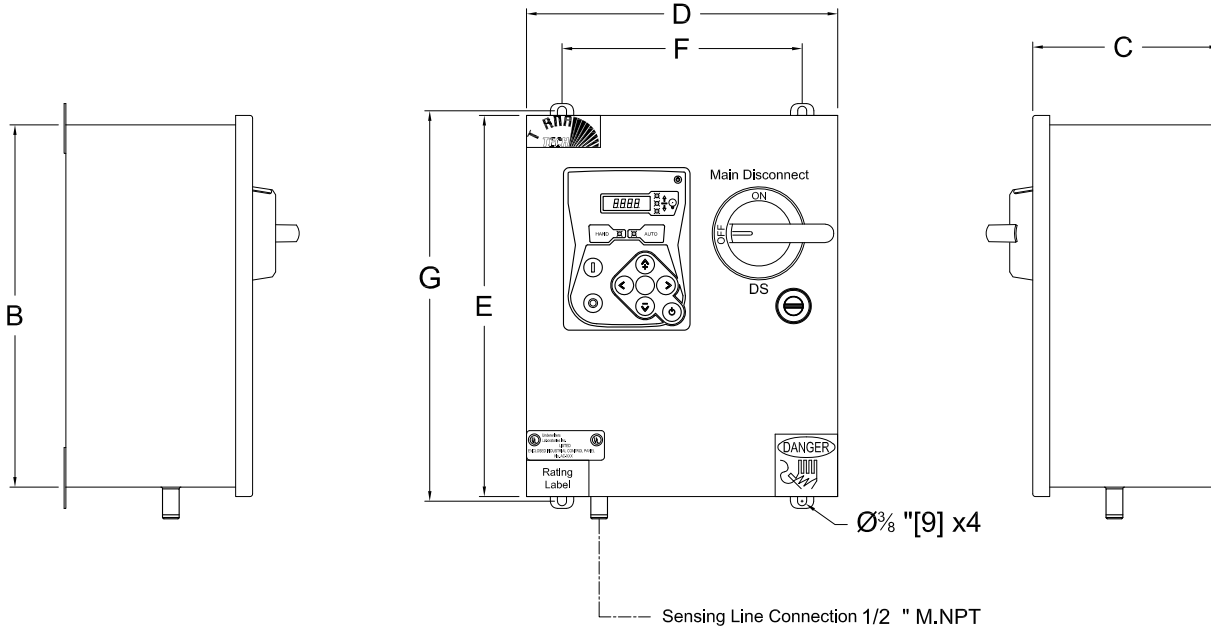


NYC
Dept of Building
Approved



REV.	DESCRIPTION	DD/MM/YY
6	Modified J19 Outputs ID	10/06/16
7	Revised logo	18/06/18
8	Sensing line connection changed	25/03/25

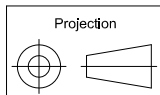
Drawing No:
JP3-DI500/E



Dimensions*					Enclosure Dimensions A X B X C	Door Dimensions D X E	Anchor Dimensions F X G
Maximum Motor Horsepower							
200-208V	220-240V	380-416V	440-480V	575-600V	10"X12"X6-1/2"	10-3/4"X12-3/4"	8"X12-3/4"
10HP	10HP	15HP	20HP	25HP	16"X16"X7-1/2"	16-1/2"X16-1/2"	14"X16-3/4"
20HP	30HP	40HP	60HP	60HP			

- 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

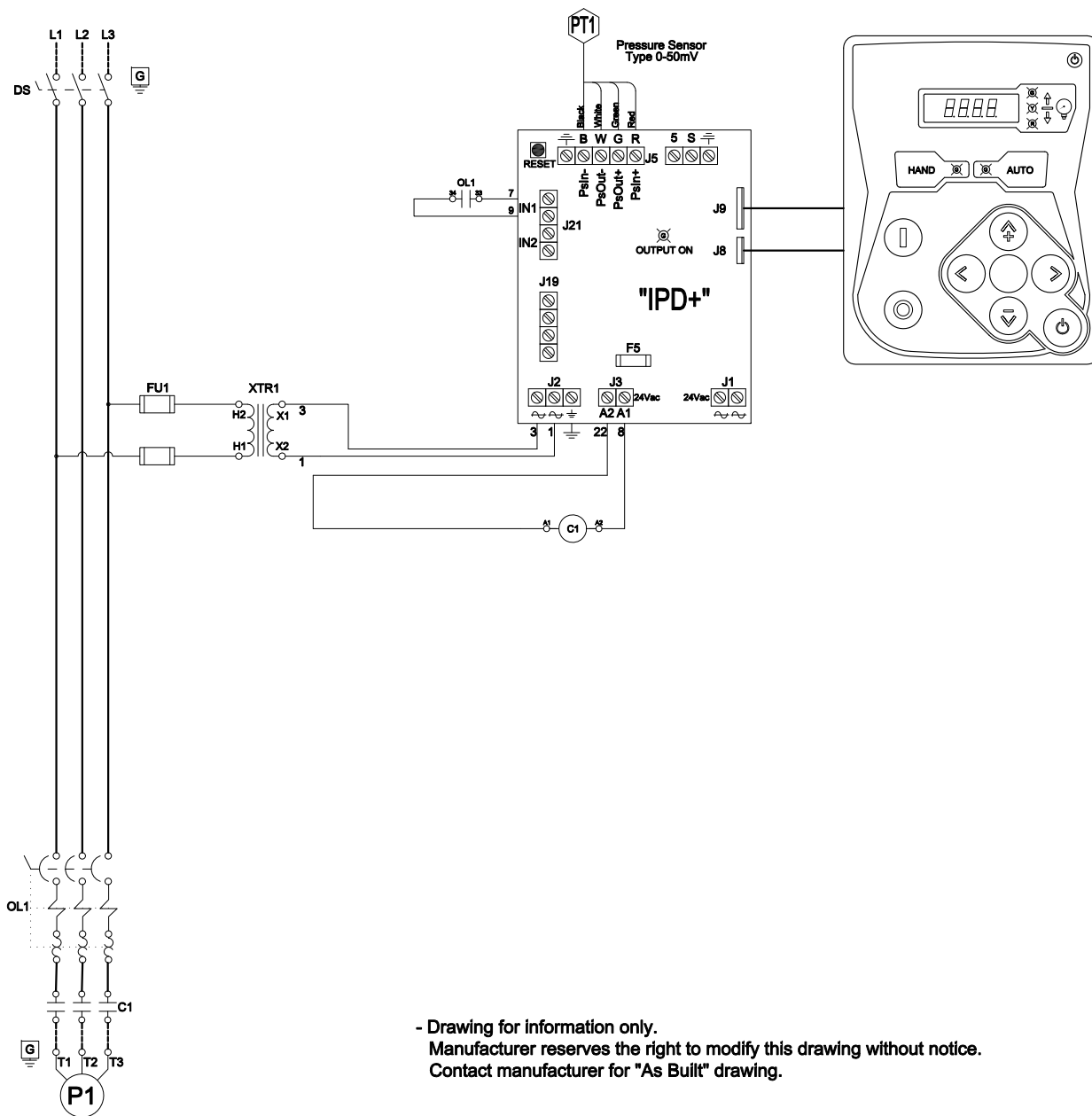
Across the Line / 3 Phase

Model:JP3

Wiring schematic

Built to the latest edition of the UL 508A & CSA C22.2 No.14 standard

PER QUOTE DRAWING No.		SEISMIC COMPLIANT	UL	SF	NYC Dept of Building Approved	
REV.	DESCRIPTION	DD/MM/YY			Drawing No.	
5	Modified Tormatech & Seismic Logo	14/04/16			10/06/16	
6	Modified J19 Outputs ID	18/06/18			JP3-WS500/E	
7	Revised logo					



- 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

Built to the latest edition of the UL 508A & CSA C22.2 No.14 standard

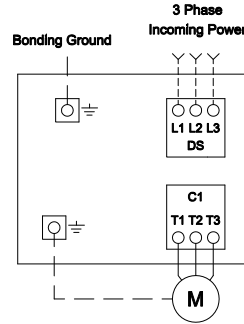
PER QUOTE DRAWING No.



REV.	DESCRIPTION	DD/MM/YY
5	Modified Tomatech & Seismic Logo	14/04/16
6	Modified J19 Outputs ID	10/06/16
7	Revised logo	18/06/18

Drawing No. JP3-TD500/E

Power Connections and Motor Connections



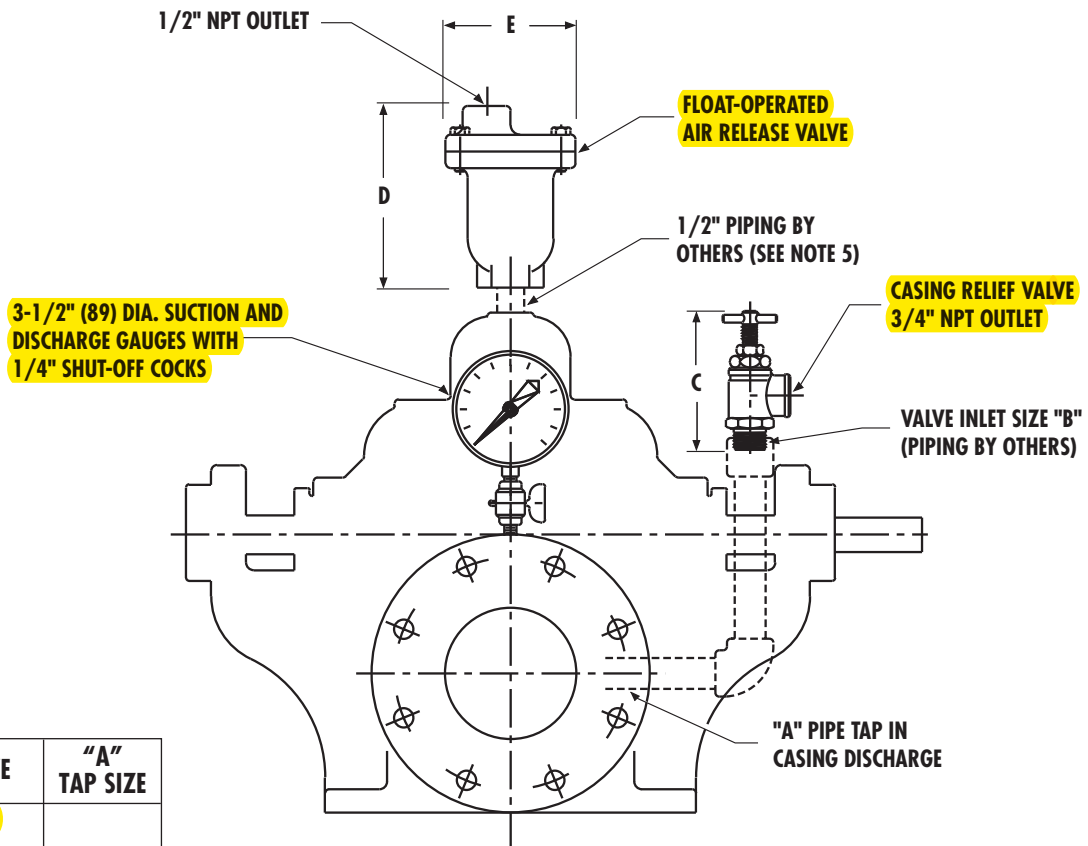
Line Terminals (L1,L2,L3,GND)

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

Accessories



PIPE SIZE	"A" TAP SIZE
2.5" 1823F	1-1/4"
3" 1824F	
4" 1823F	
4" 1824F	
5" 1822F	
5" 1823F	
5" 1824F	
6" 1822F	
6" 1822HHF	
6" 1823HHF	
6" 1823F	
6" 1824F	
6" 1825F	
8" 1822F	
8" 1825F	
10" 1823F	
10" 1824DF	
12" 1824F	
ALL VERTICAL (1840) MODELS	3/4"
ALL 2-STAGE (1920) MODELS	1-1/4"
2800/5800 MODELS	3/4"

CASING RELIEF VALVE

SYSTEM G.P.M.	VALVE INLET SIZE - "B"	"C"
250	3/4"	4-1/2" (114)
500		
750		
1000		
1250		
1500	1"	5-1/2" (140)
2000		
2500		
3000		
3500		
4000		

NOTES:

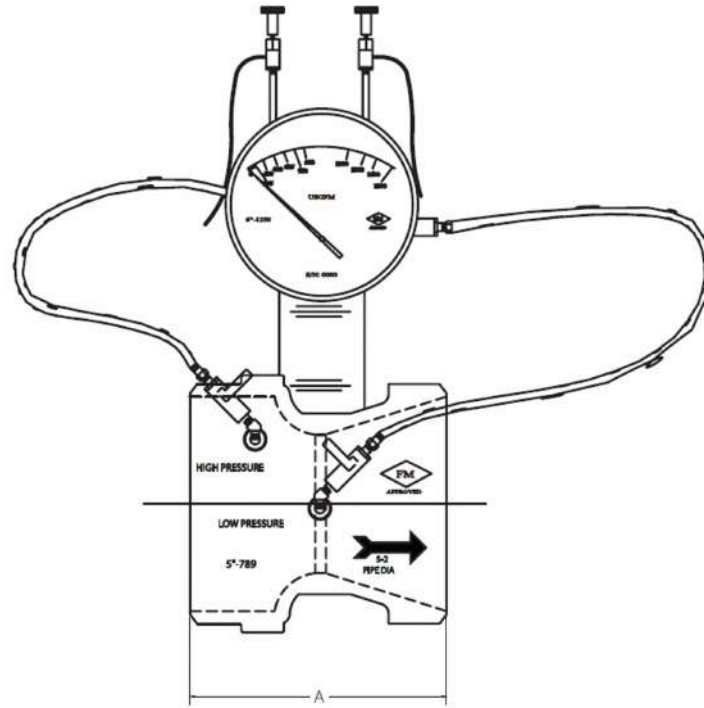
- Dimensions are in inches (mm) and may vary ± 1/4" (6).
- Accessories shown are shipped loose for field installation.
- Casing relief valve is to be adjusted to appropriate pressure upon field installation.
- Casing relief valve is furnished on electric motor driven units only.
- Two stage pumps require both vent taps piped to air release valve.
- Suction gauge range is 30"-0-150 PSI for suction pressures up to 75 PSI, or 30"-0-300 PSI for suction pressures over 75 PSI.
- Discharge gauge range is 0-300-PSI for pumps with rated discharge pressures up to 150 PSI, or 0-600 PSI for pumps with rated discharge pressures over 150 PSI.

FLOAT OPERATED AIR RELEASE VALVE

SYSTEM OPERATING PRESSURE	"D"	"E"
UP TO 175 P.S.I.	5-7/8" (149)	3-3/4" (95)
OVER 175 P.S.I.	6-11/16" (170)	5-5/8" (143)



General Arrangement



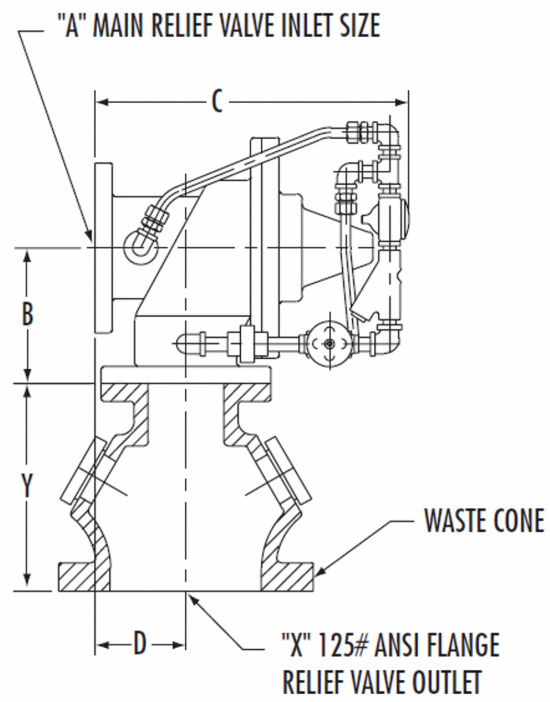
NOMINAL FLOW RATE G.P.M	PIPE SIZE	A
6,350	102	137

NOTES:

1. ACCURACY IS APPROXIMATELY 2%.
2. FLOWMETER IS GLOBAL VISION INCORPORATED VENTURI TYPE RATED FOR 500 PSI WITH BUTT-WELD, GROOVED, OR CLASS 300 FLANGED CONNECTIONS AND FOR 275 PSI WITH CLASS 150 FLANGED CONNECTIONS.
3. PROPER OPERATION REQUIRES THAT MINIMUM DISTANCES OF STRAIGHT PIPE RUNS BE MAINTAINED BOTH UPSTREAM AND DOWNSTREAM FROM FLOWMETER. REFER TO MANUFACTURER'S INSTRUCTIONS BEFORE ATTEMPTING INSTALLATION.
4. METER RANGE IN 50% TO 200% OF NOMINAL FLOW. DIAL IS DIRECT READING IN G.P.M.AND L.P.M. FOR THE SPECIFIED RANGE.
5. PART NUMBER INCLUDES COMPLETE ASSEMBLY OF VENTURI, 4" DIAMETER DIAL AND INTERCONNECTING HOSES.
6. EACH ASSEMBLY TO BE INDIVIDUALLY BOXED, WITH THE AURORA PART NO. CLEARLY MARKED ON THE OUTSIDE OF THE BOX.

Quote Information		
Customer	EGS	
Customer Quote		
Job Name	BDC New Aswan Branch BLDG.	
Market	-	
	Quote Item	002
	Quote Date	

General Arrangement



A	B	C	D
76.20	152	378	102

X	Y
127	279

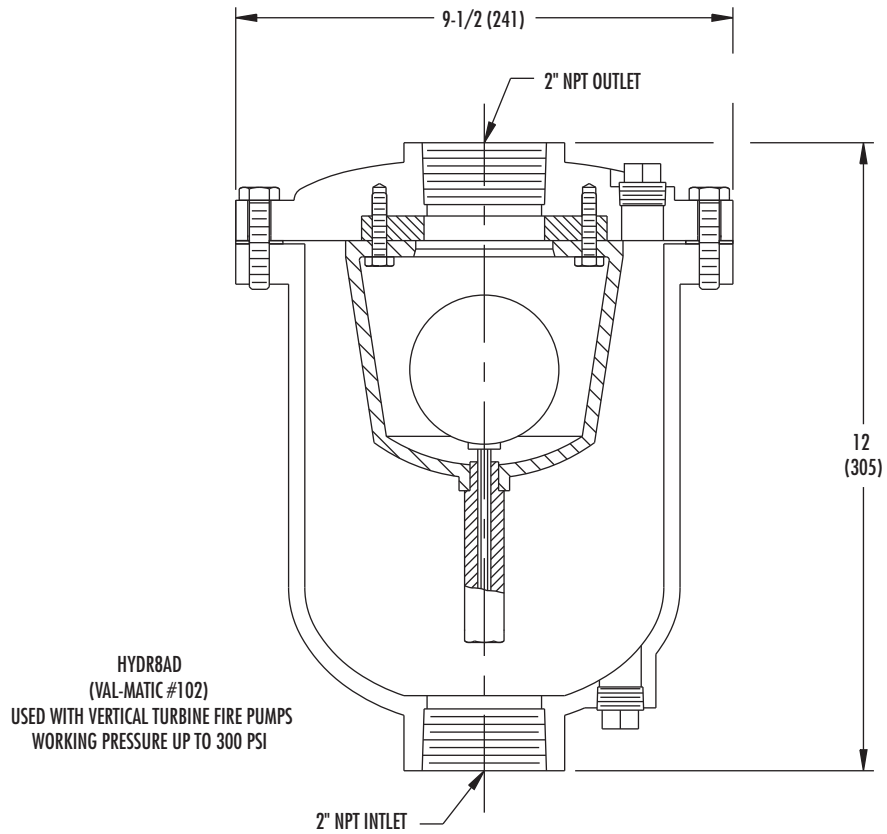
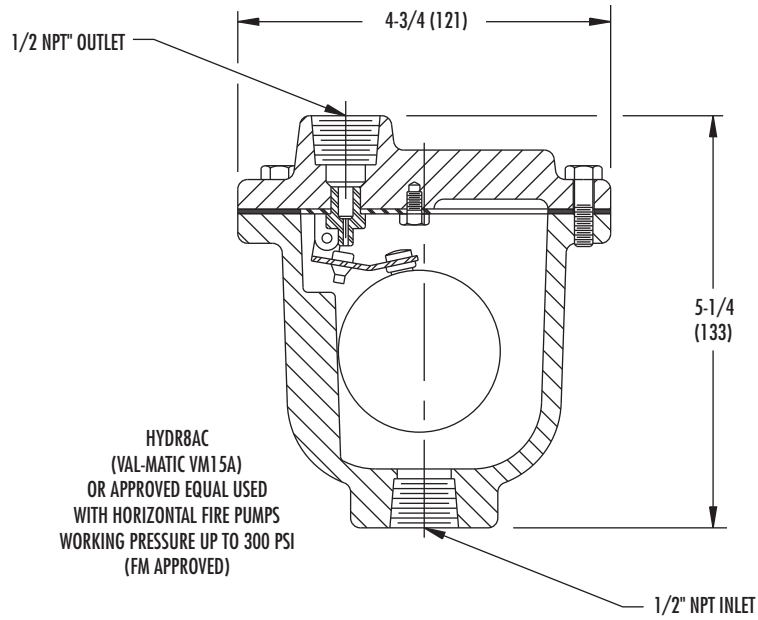
NOTES:

1. Dimensions are in inches (mm) and may vary $\pm 1/4$ (6).
2. Valves are available with inlet flange ratings of 125# or 250#. All waste cones have 125# flange ratings.
3. Dimensions for conventional relief valves are not affected by flange rating.
4. Relief valve discharge is intended to be piped to waste. Refer to factory if discharge is to be piped to a line where back pressure is present.
5. Maximum operating pressure for valves rated for 125# is 175 PSI.
6. Maximum operating pressure for valves rated for 250# is 300 PSI.

Quote Information		
Customer	EGS	
Customer Quote		
Job Name	BDC New Aswan Branch BLDG.	
Market	-	
	Quote Item	002
	Quote Date	

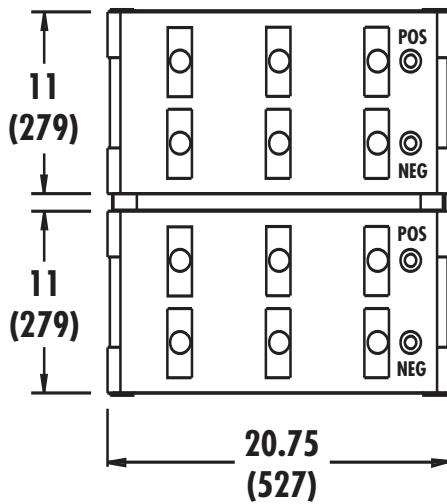
FAIRBANKS NIJHUIS™ FIRE PUMPS

AUTOMATIC AIR RELEASE VALVE



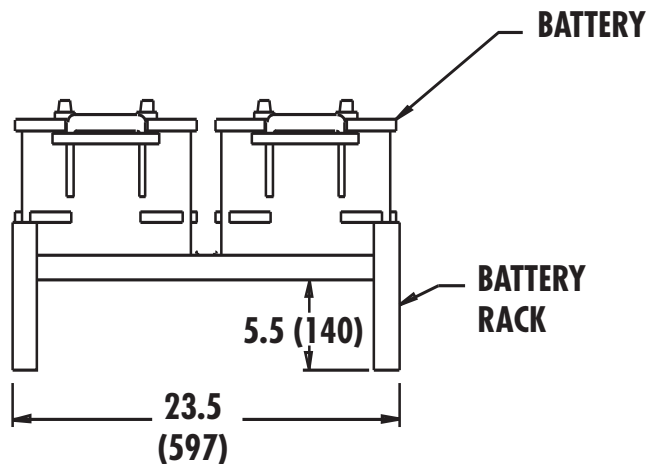
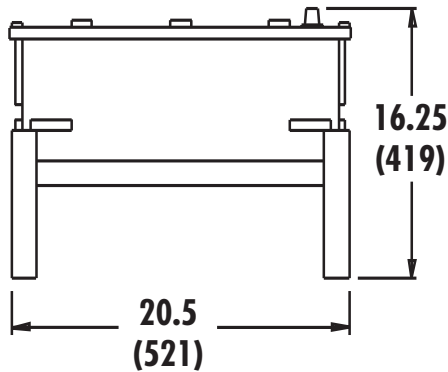
NOTES:

1. All dimensions are in inches (mm) and may vary $\pm 1/4$ (6).



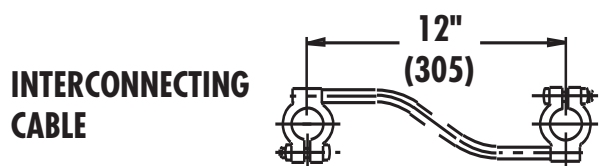
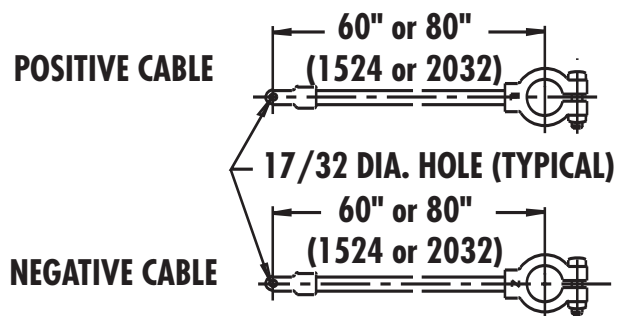
NOTES:

1. Dimensions are in inches (mm) and may vary $\pm 1/4"$ (6).
2. Batteries are 12 volt, lead-acid type D-8D, approximately 95 lbs. each, dry.
3. Batteries are shipped dry. Electrolyte (approx. 19 quarts per battery) must be procured locally.
4. Refer to Section 916 page 252 for exact number of batteries & cables to be furnished based on the diesel engine manufacturer and model used.
5. Battery racks are fabricated steel, approximately 20 lbs. each.
6. Each rack holds 2 batteries. Racks are not to be stacked.

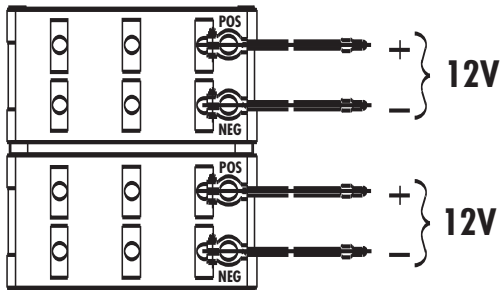


NOTES:

1. All cables are SAE J55BA type SGT with tensile attachment of 700-800 lbs.
2. Positive & negative cables 60" (1524) long are 2/0 gauge; positive & negative cables 80" (2032) long are 3/0 gauge.
3. Terminal clamps have steel reinforced inserts.
4. Not all cable types are required for every engine. Refer to Section 916 page 252 for cable applicability.



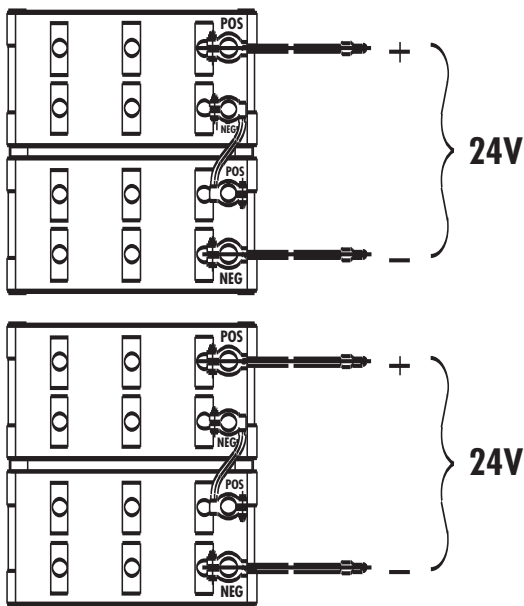
12 VOLT SYSTEM



REQUIRED COMPONENTS	ENGINE APPLICABILITY
(1) BATTERY RACK (2) BATTERIES (2) POSITIVE CABLES (2) NEGATIVE CABLES	CUMMINS: ALL "CFP" MODELS CLARKE: ALL "JU4H" MODELS ALL "JU64" MODELS ALL "JW6H" MODELS EDWARDS: ALL MODELS

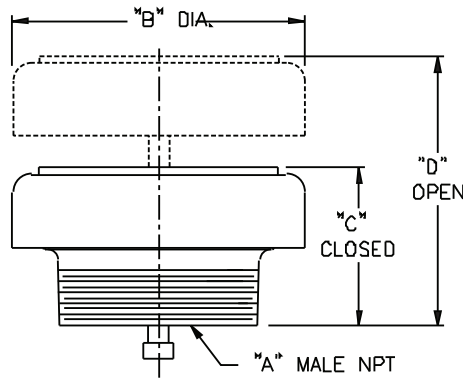
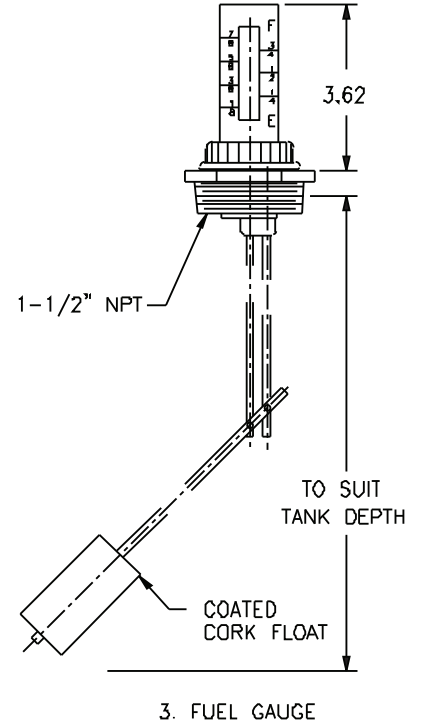
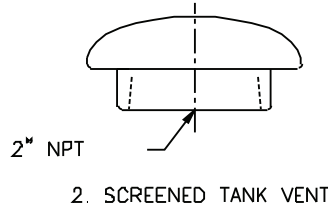
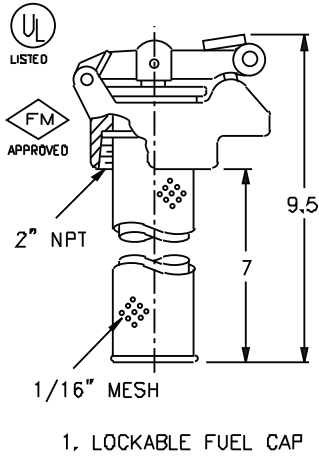
NOTES:

- Clarke "VMFP," "JU4H" & "JU6H" Engines require cable sets of different lengths. On these engine models, a 2/0 guage positive and negative cable set 60" (1524 mm) long, and a 3/0 guage positive and negative cable set 80" (2032 mm) long are furnished.
- Refer to Section 916, Page 251 for details of batteries, racks and cables.

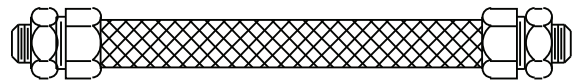
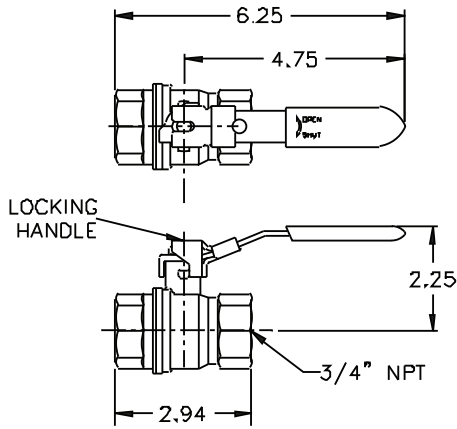


24 VOLT SYSTEM

REQUIRED COMPONENTS	ENGINE APPLICABILITY
(2) BATTERY RACKS (4) BATTERIES (2) POSITIVE CABLES (2) NEGATIVE CABLES (2) INTERCONNECTING CABLES	CLARKE: ALL "JX6H" MODELS CATERPILLAR: ALL MODELS



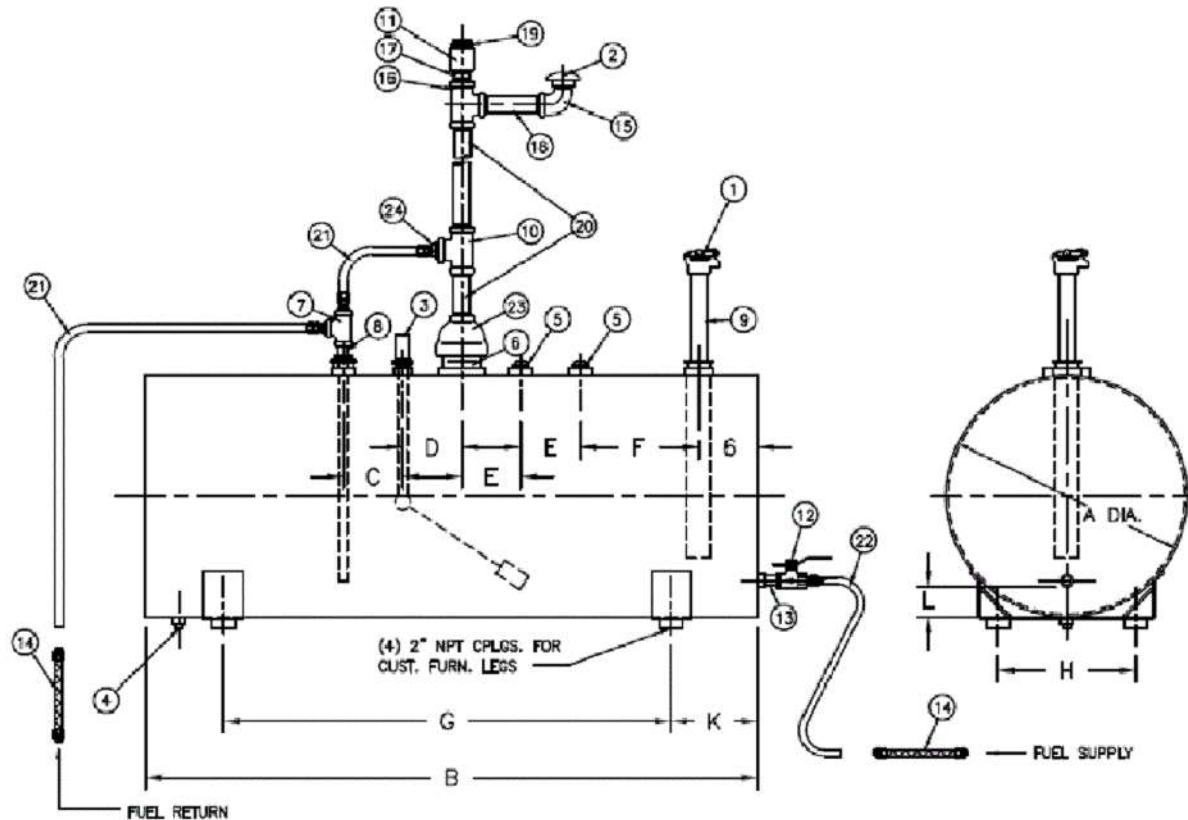
"A"	"B"	"C"	"D"
4"	7.00	3.78	6.44
6"	10.20	4.46	6.53



NOTES

1. All dimensions are in inches and may vary $\pm 1/4"$.
2. Components shown are shipped loose for field assembly.
3. Illustration is for component identification only. Actual installation must meet local codes and all applicable standards.
4. Refer to Section 916 pages 255 through 258 for the location and applicability of each component shown above

General Arrangement



A	B	C	D	E	F	G	H	K	L	Z
610	1,549	152	152	152	330	1,118	356	216	60.96	3" NPT

DIESEL FUEL TANK NOTES:

1. Tanks are constructed and labeled in accordance with UL-142.
2. Fittings shown are consistent with N.F.P.A. 30 and UL-142.
3. Tank to be pitched toward drain 1/4" per foot with outlet on the same elevation as engine fuel pump. Means of elevating Tank (by others) may be required.
4. Usable tank volume is total capacity less 5% for expansion.

ILLUSTRATION NOTES:

1. All dimensions are in mm and may vary $\pm 0.25"$ (6.35 mm).
2. Components shown are shipped loose for field assembly.
3. Illustration is for component identification only. Actual installation must meet local codes and all applicable standards.
4. Refer to section 916 page 259 for details of Pentair furnished components.

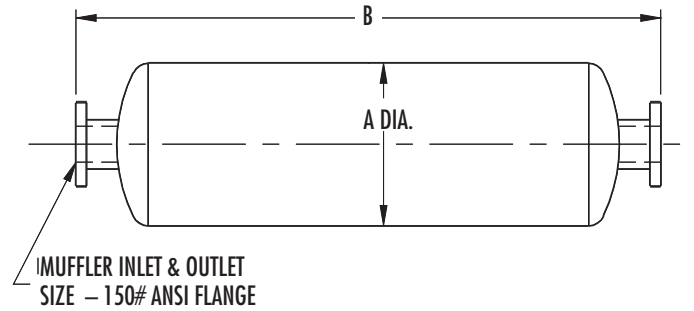
Fuel Tank Information		
Nominal Tank Size	119 US gallon	
Usable Volume	105 US gallon	
Tank Type	Single Wall	
Fuel Tank Sizing	NFPA 20 & UL 142	
Fuel Tank Includes 3" emergency vent		
Weight	113.4 kg	
Components Furnished By Pentair		
Item No.	Qty	Description
1	1	2" NPT Lockable Fuel Cap
2	1	2" NPT Screened Tank Vent"
3	1	Fuel Gauge 1 1/2" NPT
4	1	1" NPT Drain Plug
5	2	2" NPT Pipe Plug
6	1	4" NPT Close Nipple
7	1	1/2" NPT Tee
8	1	1/2" NPT Close Nipple
9	1	2" Fuel Fill Black Pipe
10	1	"Z"x"Z"x"2" NPT Tee
11	1	"Z" NPT Pipe Coupling
12	1	3/4" NPT Lockable Fuel Value
13	1	3/4" NPT Close Nipple
14	2	Fuel Hoses For Supply & Return (Furnished By Engine Mfr.)
15	1	2" NPT Street Elbow
16	1	"Z"x"Z"x"2" NPT Tee
17	1	"Z" NPT Closed Nipple
18	1	2" NPT X 6" Long Nipple
19	1	"Z" NPT Emergency Vent
23	1	4"x"Z" NPT Reducer
24	1	2"x1/2" NPT Reducer
Components Furnished By Others		
Item No.	Qty	Description
20	1	"Z" Size Piping For Vent
21	1	1/2" Tubing And Fittings or 1/2" Black Pipe
22	1	3/4" Tubing And Fittings or 3/4" Black Pipe
Quote Information		
Customer	EGS	
Customer Quote		
Job Name	BDC New Aswan Branch BLDG.	
Market	-	
	Quote Item	002
	Quote Date	

DIESEL ENGINE MUFFLERS

Date **July 2012**

Supersedes Section 916 Page 261

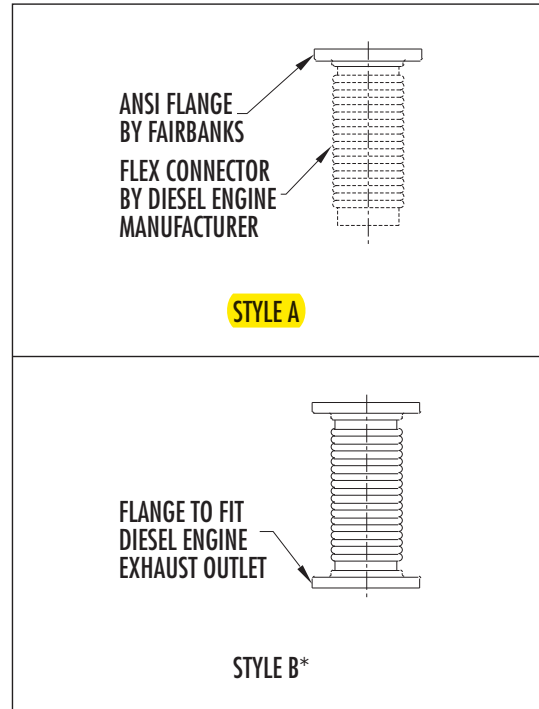
Dated August 2011



ENGINE MODEL	MUFFLER INLET & OUTLET	COMMERCIAL GRADE			RESIDENTIAL GRADE			CRITICAL GRADE		
		A	B	WGT	A	B	WGT	A	B	WGT
CATERPILLAR										
3406C	6" FLANGED	12	42	35	12	54	43	16	73	131
3412C*, 3508C, C18*	8" FLANGED	18	49	110	18	61	124	20	75	220
CLARKE FIRE PROTECTION										
JU4H-UF10, -UF12, -UF14, -UF20, -UF22, -UF24, -UFAB26, -UFAEAO, -UFAEE8, -UFAEF2, -UFADJ2, -UFADJ8	3" NPT	8	36	19	8	42	21	10	42	42
JU4R-UF09, -UF11, -UF13, -UF19, -UF21, -UF23, -UFAEA9, -UFAEE7, -UFAEF1										
JU4H-UF30, -UF32, -UF34, -UF40, -UF42, -UF 50, -UF52, -UF54, -UF58, -UFADJG, -UFADPO, -UFADRO, -UFADW8, -UFADY8, -UFAD5G	4" FLANGED	10	36	24	10	46	29	12	55	68
JU4R-UF40, -UF49, UF51 -UF53										
JU6H-UF30, -UF32, -UF34, -UF 50, -UF52, -UF54, -UF58, -UF60, -UF62, -UF62, -UF68, -UF84, -UFAAPG, -UFAAQ8, -UFAARG, -UFAASO, -UFAB76, -UFABLO, -UFABL8, -UFDO, -UFD2, -UFG8, -UFMO, -UFM2, -UFM8, -UFAD58, -UFAD88, -UFADMO, -UFADM8, -UFADNO, -UFADNG, -UFADP8	5" FLANGED	10	42	27	10	54	34	14	61	92
DP6H SERIES										
JW6H-UF30, -UF40, UF48										
DSOH SERIES*	5" FLANGED	10	42	27	10	54	34	14	61	92
DR8H SERIES*										
JW6H-UF50, -UF58, -UF60, -UF8, -UFAAM8, -UFAA80, -UFADDO, -UFADBO, -UFADFO, -UFADJO, -FAD70, -UFAD80										
JU6H-UFAD98, -UFADPO, -UFADQO, -UFADRO, -UFADR8, -UFADSO, -UFADS8, -FADTO, -UFADW8 -UFADX8	6" FLANGED	12	42	35	12	54	43	16	73	131
DQ6H SERIES										
DT2H SERIES*										
JX6H SERIES	8" FLANGED	18	49	110	18	61	124	20	75	220
CUMMINS										
CFP5E, CFP59, CFP7E Series	4" NPT, FLANGED	10	36	24	10	46	29	12	55	68
CFP83 Series	4" NPT, FLANGED	10	36	24	10	46	29	12	55	68
CFP9E Series	5" NPT, FLANGED	10	42	27	10	54	34	14	61	92
CFP11E Series	5" NPT, FLANGED	10	42	27	10	54	34	14	61	92
CFP15E Series	6" FLANGED	12	42	35	12	54	43	16	73	131
CFP23E Series	8" NPT, FLANGED	18	49	110	18	61	124	20	75	220
CFP30E Series	10" NPT, FLANGED	22	64	205	22	75	220	28	99	360
DEUTZ										
DFP4-2011 Series	3" NPT	8	36	19	8	42	21	10	42	42
DFP4-2012 Series	4" FLANGED	10	36	24	10	46	29	12	55	68
DFP6 Series	6" FLANGED	12	42	35	12	54	43	16	73	131



ENGINE MODEL	MUFFLER CONNECTION SIZE	FLEX CONNECTOR STYLE
CATERPILLAR		
3406C	6" FLANGED	B
3412C*, 3508C, C18*	8" FLANGED	B
CLARKE FIRE PROTECTION		
JU4H-UF10, -UF12, -UF14, -UF20, -UF22, -UF24, -UFAB26, -UFAEAO, -UFAEE8, -UFAEF2, -UFADJ2, -UFADJ8	3" NPT	A
JU4R-UF09, -UF11, -UF13, -UF19, -UF21, -UF23, -UFAEA9, -UFAEE7, -UFAEF1		
JU4H-UF30, -UF32, -UF34, -UF40, -UF42, -UF50, -UF52, -UF54, -UF58, -UFADJG, -UFADPO, -UFADRO, -UFADW8, -UFADY8, -UFAD5G	4" FLANGED	A
JU4R-UF40, -UF49, UF51 -UF53		
JU6H-UF30, -UF32, -UF34, -UF50, -UF52, -UF54, -UF58, -UF60, -UF62, -UF62, -UF68, -UF84, -UFAAPG, -UFAAQ8, -UFAARG, -UFAASO, -UFAB76, -UFABLO, -UFABL8, -UFDO, -UFD2, -UFG8, -UFMO, -UFM2, -UFM8, -UFAD58, -UFAD88, -UFADMO, -UFADM8, -UFADNO, -UFADNG, -UFADP8	5" FLANGED	B
DP6H SERIES		
JW6H-UF30, -UF40, UF48		
DSOH SERIES*	5" FLANGE	B
DR8H SERIES*		
JW6H-UF50, -UF58, -UF60, -UF8, -UFAAM8, -UFAA80, -UFADDO, -UFADBO, -UFADFO, -UFADJO, -FAD70, -UFAD80	6" FLANGED	B
JU6H-UFAD98, -UFADPO, -UFADQO, -UFADRO, -UFADR8, -UFADSO, -UFADS8, -FADTO, -UFADW8 -UFADX8		
DQ6H SERIES		
DT2H SERIES*		
JX6H SERIES	8" FLANGED	B
CUMMINS		
CFP5E, CFP59, CFP7E Series	3" NPT, FLANGED, CUFF	A, B
CFP83 Series	4" NPT, FLANGED, CUFF	A, B
CFP9E Series	4" NPT, FLANGED, CUFF	A, B
CFP11E Series	5" NPT, FLANGED, CUFF	A, B
CFP15E Series	6" FLANGED	B
CFP23E Series	6" FLANGED	B
CFP30E Series	6" FLANGED	B
DEUTZ		
DFF4-2011 Series	3" NPT	A
DFF4-2012 Series	4" FLANGED	B
DFF6 Series	6" FLANGED	B



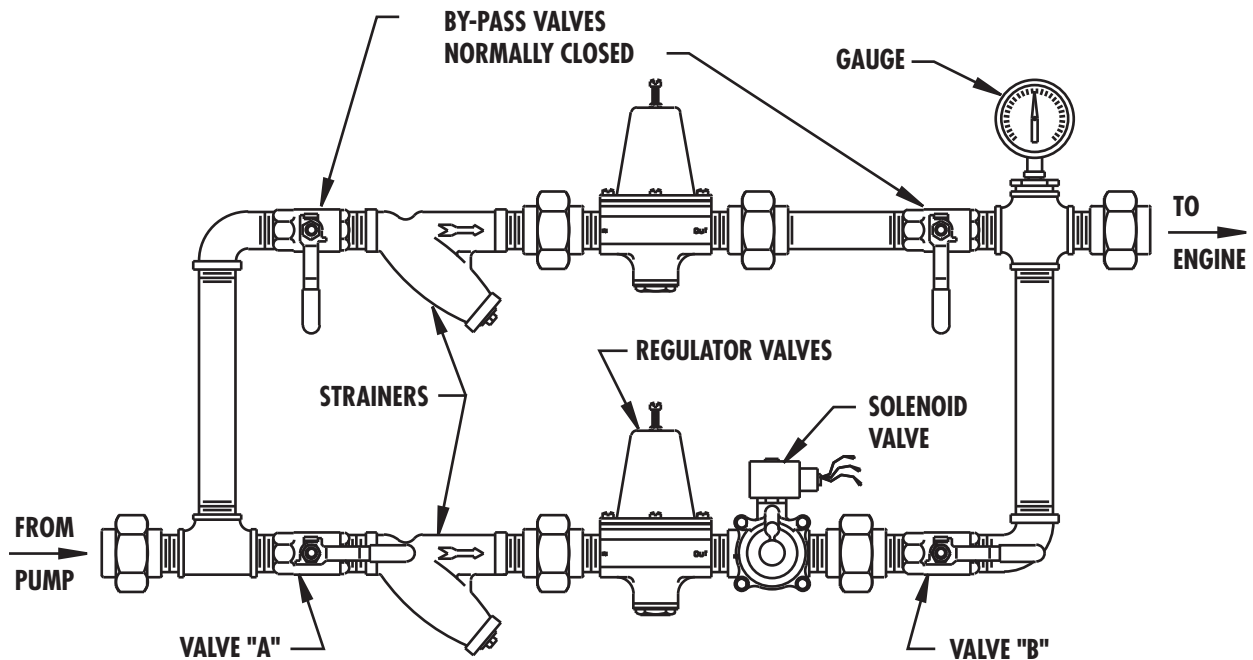
*FLANGED FLEX CONNECTOR PROVIDED BY DIESEL ENGINE MANUFACTURER. NO ADDITIONAL FLEX CONNECTOR OR ADAPTOR FITTING IS REQUIRED OR PROVIDED BY FAIRBANKS NIJHUIS™.

**DIESEL ENGINE DRIVEN FIRE PUMP
COOLING WATER PIPING DATA**

Date **April 2006**

Supersedes Section 916 Page 301

Dated January 1997



This instructional data explains the installation and operation of the cooling system for UL listed, FM approved Fire Pump engines equipped with heat exchangers.

Engines equipped with heat exchangers use an engine mounted water pump to circulate jacket water around the tubes of the heat exchanger to maintain proper jacket water temperatures. Cooling water, supplied by the Fire Pump, is piped through the tubes and discharged to waste.

REQUIREMENTS

The loop portion of the cooling water supply piping, shown above, incorporates all components required by NFPA and is sized to provide the required volume of water at the proper pressure for the heat exchangers of the engine models listed in Table A.

Model 1800 & 1900 pumps are shipped from the plant with the loop piped between the pump and engine. The pipe and loop sizes are determined by the engine model.

COMPONENTS

1. A flushing type strainer is used to protect the regulator valve, solenoid valve and the tubes of the heat exchanger from foreign material.
2. The regulator valve is used to control the volume and pressure of the cooling water.
3. The solenoid valve opens automatically when the engine is started and closes automatically on engine

shutdown to prevent the waste of cooling water. (One red wire must be connected to terminal #1 of the engine junction box, the other red wire to terminal #11 of the engine junction box, and the green wire grounded to the engine block. Refer to applicable wiring diagrams.)

4. The valves in the BYPASS line of the loop are normally CLOSED. They should ONLY be opened to provide cooling water to the engine if the regulator valve or solenoid valve require repair.
5. Valves "A" and "B" are normally OPEN. They should ONLY be closed if repair is required to the regulator valve or solenoid valve.
6. The gauge indicates back pressure on the cooling water discharge. The recommended back pressure to assure adequate flow is 15-20 PSI and should not exceed the allowable pressure shown in Table A.
7. Since cooling loop components are subject to bumps and movement during shipping, all components must be checked for pipe strain and leakage prior to initial startup.

INSTALLATION -COOLING WATER OUTLET

The cooling water outlet piping from the engine heat exchanger must be at least the size listed in Table A. The piping must be short, have no valves and discharge into an open waste cone. If deviations from the requirement of discharge to an open waste cone are permitted by the authority having jurisdiction, the proposed plumbing must be reviewed to assure that the back pressure created will not reduce the cooling water flow to below that required for the engine.

**DIESEL ENGINE DRIVEN FIRE PUMP
COOLING WATER PIPING DATA**

If the outlet piping from two or more engines is connected to a common manifold, the manifold piping should be sized such that the velocity resulting from the combined flow is the same as that in the outlet piping between the manifold and heat exchanger.

Adequate pipe supports must be provided for the loop and outlet piping to minimize vibration and prevent excessive strain at the heat exchanger, pump and engine connections.

Engine coolant should be added in accordance with the engine manufacturer's recommendations.

OPERATION

The regulator valve is adjusted during operational tests at the plant and set between 15 and 20 PSI back pressure. If additional

adjusting is necessary, see the following procedure:

With the pump operating at the rated duty, the adjustment is made after the engine block temperature has risen to the level required to open the engine thermostat. The thermostat opens at approximately 170°F. The temperature will stabilize and then decrease slightly. At this point, the regulator is adjusted between 15 and 20 PSI by turning the regulator screw clockwise to increase the pressure and counterclockwise to reduce the pressure. The regulator screw is then locked into place with the locknut provided.

MAINTENANCE

1. Strainers must be inspected frequently and kept clean.
2. If cooling water temperature changes, the regulator valve may require adjustment.