



TORNATECH

Project: _____

Customer: _____

Engineer: _____

Pump Manufacturer: _____

Drawing Submittal Package

Model VPR

Pressure Limiting (VFD)
Electric Fire Pump Controller
with Autotransformer Bypass



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.

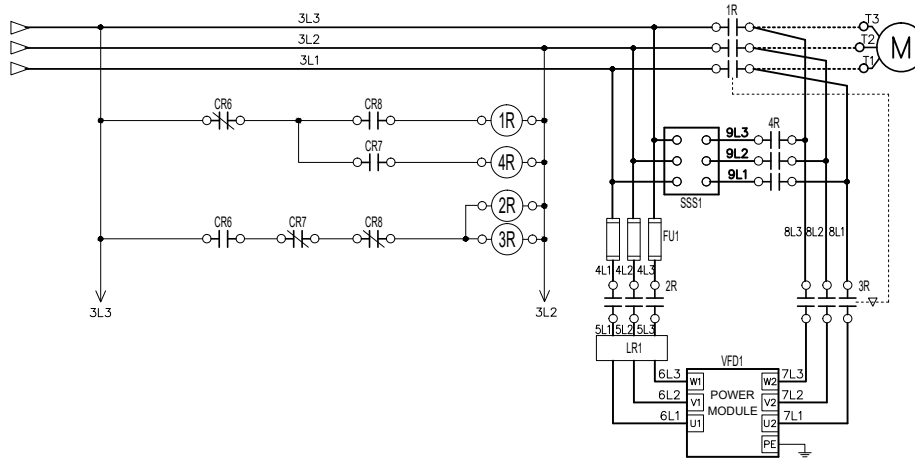


N.Y.C.
APPROVED

Technical Data

Model VPR Pressure Limiting (VFD) Electric Fire Pump Controller

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



N.Y.C.
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OPTIONAL

Standard, Listings and Certifications	Built to NFPA 20 (latest edition)	
	Underwriters Laboratory (UL)	<ul style="list-style-type: none"> • UL218 - Fire Pump Controllers • UL 1008 - Automatic power transfer switches for fire pump controllers
	New York City	Accepted for use in the City of New York by the Department of Buildings
	Optional	
	<input type="checkbox"/> CE Mark	Various EN, IEC & CEE directives and standards

*Please see Disconnecting Means details on page 3.

Enclosure	Protection Rating	
	<input type="checkbox"/> Standard: NEMA 2 (IP31)	
	Optional	
	<input type="checkbox"/> NEMA 12	
	<input type="checkbox"/> NEMA 3	
	<input type="checkbox"/> NEMA 3R	
	<input type="checkbox"/> IP54	
	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

Shortcircuit Withstand Rating	200V to 208V 60Hz		220V to 240V 60Hz		380V to 416V 50 Hz / 60Hz		440V to 480V 60Hz		600V 60Hz	
	Normal Power	Alternate Power	Normal Power	Alternate Power	Normal Power	Alternate Power	Normal Power	Alternate Power	Normal Power	Alternate Power
	HP									
<input type="checkbox"/> Standard 100kA	5-150		5-200		5-300		5-400		n/a	
<input type="checkbox"/> Optional 150kA	n/a		n/a		n/a		n/a		5-500	
<input type="checkbox"/> Standard 50kA	n/a		n/a		n/a		n/a		5-500	
<input type="checkbox"/> Optional 100kA	n/a		n/a		n/a		n/a		5-500	



Ambient Temperature Rating	Standard: 5°C to 40°C / 41°F to 104°F
Operating Modes	The controller shall have the capability of running the pump motor in the following three (3) modes via a speed mode selector switch: <ul style="list-style-type: none"> • Variable mode: Upon an automatic or manual start, the controller shall start the pump through the variable frequency drive (VFD) and instantly regulate the motor speed in reference to the discharge pressure • Preset mode: Upon an automatic or manual start, the controller shall start the pump through the variable frequency drive (VFD) and run the pump motor at a pre-determined speed. This pre-determined speed shall be adjustable on the variable frequency drive (VFD) itself • Bypass mode: Upon an automatic or manual start, the controller shall start the pump through the reduced voltage soft start bypass circuit.
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 • 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 • The recorder will register and keep in memory pressure fluctuations over time that have occurred over the previous seven (7) days and events, alarms, general system information that have occurred over the previous fifteen (15) • Information is retrievable through DB9 communication port accessible without having to open the controller door.
Pressure Sensing	<ul style="list-style-type: none"> • Pressure transducers (2) for reading of discharge pressure • Pressure sensing line connection 1/2" Female NPT • Rated for 0-600PSI working pressure • Externally mounted with protective cover



Audible Alarm	Alarm buzzer		
Visual Indications	<ul style="list-style-type: none"> • Normal power available • Alternate power available • Normal position • Alternate position 	<ul style="list-style-type: none"> • Individual phase-to-phase voltage indication + Hz frequency (normal power) • Individual phase current indication • Pressure indication • Elapsed run time 	
Visual & Audible Alarms	<p>Visual only</p> <ul style="list-style-type: none"> • Power loss • Motor run • Phase reversal • Phase unbalance <p>Visual and Audible</p> <ul style="list-style-type: none"> • Overcurrent • Undercurrent • Fail to start <p>Audible only</p> <ul style="list-style-type: none"> • Fault SSS (soft-start) 	<ul style="list-style-type: none"> • Phase loss L1 • Phase loss L2 • Phase loss L3 • Low System pressure 	<ul style="list-style-type: none"> • Undervoltage • Overvoltage** • Locked rotor • System trouble • Pressure transducer problem • By-pass mode • VFD Failure
Remote Alarm Contacts	<p>DPDT-8A-250V.AC</p> <ul style="list-style-type: none"> • Power available • Phase loss • Power loss • Overvoltage • Undervoltage • Phase unbalance • Phase reversal • Bypass mode • VFD Failure • Motor run 	<ul style="list-style-type: none"> • Common motor trouble • Overcurrent • Undercurrent • Fail to start • Pressure transducer problem 	
Operator Interface	<ul style="list-style-type: none"> • Micro-processor based • Accessible without opening main door • Voltage and current indication • Pressure settings and system pressure indication • 15 day pressure and 15 day event 		
Operation	Automatic Start	<ul style="list-style-type: none"> • Start on pressure drop 	
	Manual Start	<ul style="list-style-type: none"> • Start 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
	Mode		<ul style="list-style-type: none"> • Automatic • Non-automatic

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



Model VPR Pressure Limiting (VFD) Electric Fire Pump Controller

<input type="checkbox"/> A06B	Lockout Circuit from other VPx
<input type="checkbox"/> A07B	Interlock Circuit from other VPx
<input type="checkbox"/> A9	Low zone pump control function
<input type="checkbox"/> A10	Medium zone pump control function
<input type="checkbox"/> A11	High zone pump control function
<input type="checkbox"/> 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
<input type="checkbox"/> B11B	Built in alarm panel same as B11 but 220-240VAC supervisory power
<input type="checkbox"/> B19A	High motor temperature c/w thermostat relay and alarm contacts (DPDT)
<input type="checkbox"/> B19B	High motor temperature c/w PT100 relay and alarm contacts (DPDT)
<input type="checkbox"/> C1	Extra motor run alarm contact (DPDT)
<input type="checkbox"/> C4	Periodic test alarm contact (DPDT)
<input type="checkbox"/> C7	Low pump room temperature alarm contact (DPDT)
<input type="checkbox"/> C10	Low water reservoir level alarm contact (DPDT)
<input type="checkbox"/> C14	Pump on demand / automatic start alarm contact (DPDT)
<input type="checkbox"/> C15	Pump fail to start alarm contact (DPDT)
<input type="checkbox"/> C18	High water reservoir level c/w visual indication and alarm contact (DPDT)
<input type="checkbox"/> C19	Emergency start alarm contact (DPDT)
<input type="checkbox"/> C21	Deluge valve start alarm contact (DPDT)
<input type="checkbox"/> C22	Remote automatic start alarm contact (DPDT)
<input type="checkbox"/> C23	Remote manual start alarm contact (DPDT)
<input type="checkbox"/> C24	High pump room temperature alarm contact (DPDT)

<input type="checkbox"/> Cx	Additional visual and alarm contact (Specify function) (DPDT)
<input type="checkbox"/> D1	Low suction pressure transducer for fresh water rated at 0-300PSI with visual indication and alarm contact
<input type="checkbox"/> D1A	Low suction pressure transducer for sea water rated at 0-300PSI with visual indication and alarm contact
<input type="checkbox"/> D13	High withstand rating for (normal power section) • 208V to 480V = 150kA • 600V = 100kA
<input type="checkbox"/> D14	Anti-condensation heater & thermostat
<input type="checkbox"/> D14A	Anti-condensation heater & humidistat
<input type="checkbox"/> D14B	Anti-condensation heater & thermostat & humidistat
<input type="checkbox"/> D15	Tropicalization
<input type="checkbox"/> D24	Audible Alarm
<input type="checkbox"/> D26	Modbus with RTU frame format and RS485 connection
<input type="checkbox"/> D26A	Modbus TCP / IP provision
<input type="checkbox"/> D27	Motor heater connection (external single phase power source and heater on/off contact)
<input type="checkbox"/> D27A	Motor heater connection (internal single phase power source and heater on/off contact)
<input type="checkbox"/> D28	Customized drawing set
<input type="checkbox"/> D37	Window kit for operator interface

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

Technical Data

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Operator Interface

