TORNATECH

Project: _____

Customer: _____

Engineer: _____

Pump Manufacturer: _____

Technical Data
Submittal Document

VPx Series

Full Service - Variable Speed
Electric Fire Pump Controller

Contents:
Data Sheets
Dimensional Data
Wiring Schematics
Field Connections

c(UL)us   FM APPROVED

October 2023

Select Bypass starting method

Model VPA
Across the line
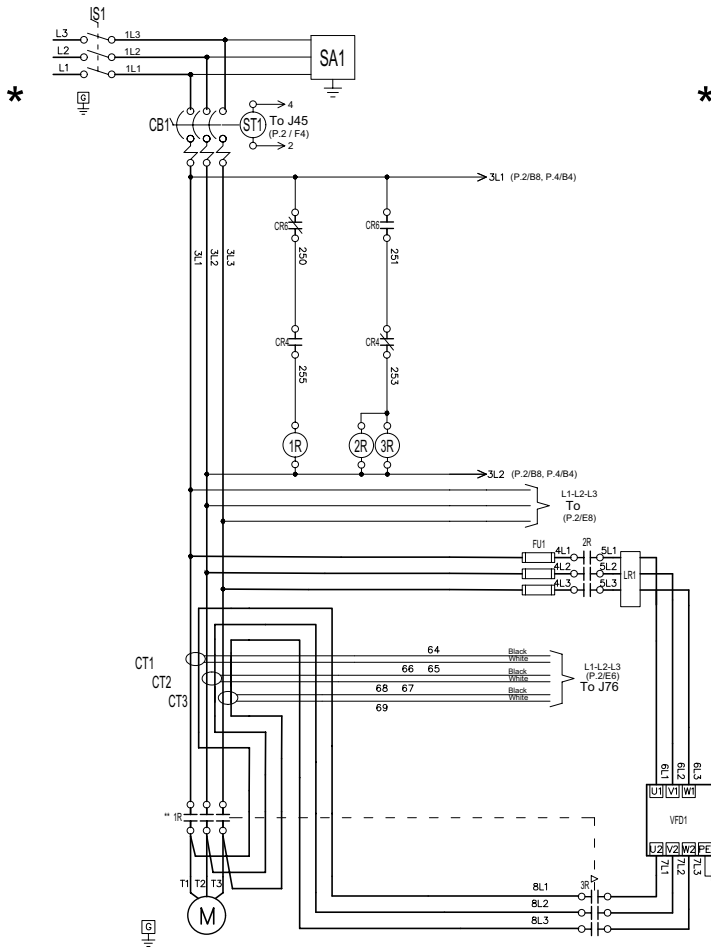
Model VPS
Soft Start Soft Stop
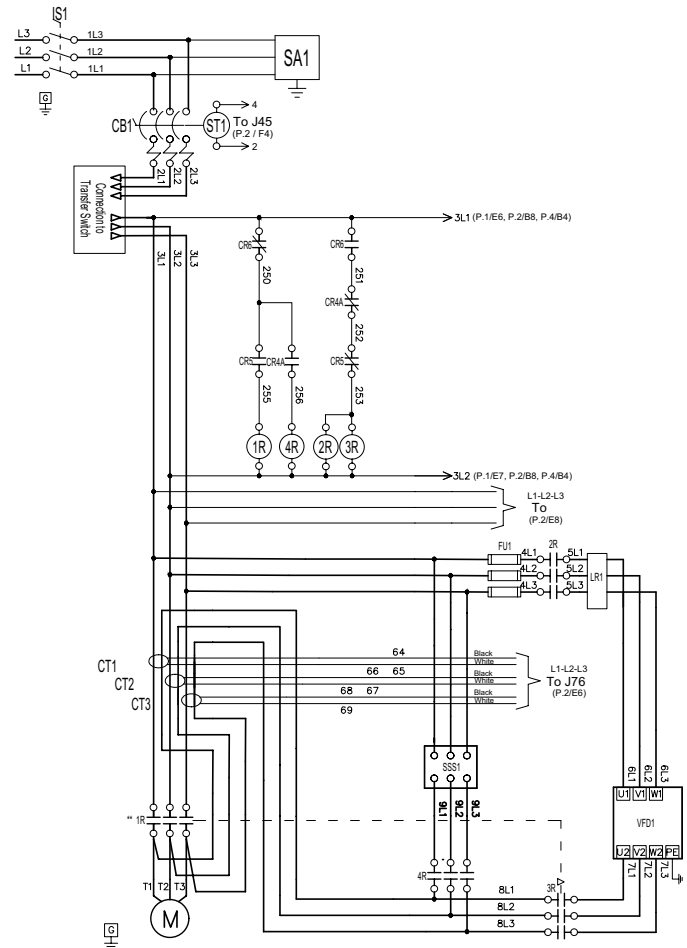
*From normal incoming power through Disconnecting Means (IS/CB)
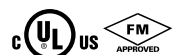*For Disconnecting Means details see page 3

October 2023

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Standard, Listings, Approvals and Certifications	**Built to NFPA 20 (latest edition)**	
	Underwriters Laboratory (UL)	UL218 - Fire Pump Controllers
	FM Global	Class 1321/1323

Enclosure	**Protection Rating**	
	Standard: NEMA 12 ventilated assembly	
	Accessories • Gland plate(s) • Lifting Lugs • Keylock handle	**Paint Specifications** • Red RAL3002 • Powder coating • Glossy textured finish

Shortcircuit Withstand Rating	**200V 60Hz**	**208V to 240V 60Hz**	**380V to 415V 50 Hz / 60Hz**	**440V to 480V 60Hz**	**575V to 600V 60Hz**
	HP (kw)				
	5 to 75	5 to 100	5 to 350	5 to 450	5 to 100
	Standard 100kA				Standard 50kA

Ambient Temperature Rating	**Standard**: 4°C to 40°C / 39°F to 104°F
Surge Suppression	Surge arrestor rated to suppress surges above line voltage

Disconnecting Means	• Isolating switch and circuit breaker assembly:
	   - 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	• Flange mounted • Integrated limit switch • Pull and latch activation • Across the line start (direct on line)
Locked Rotor Protector	• Operate shunt trip to open circuit breaker • Trip between 8 and 20 seconds • Factory set at 600% of motor full load current
Electrical Readings	• Voltage phase to phase (normal power) • Amperage of each phase when motor is running
Pressure Readings	• Continuous system pressure display • Constant pressure output set-point • Cut-in and Cut-out pressure settings

Pressure and Event recorder	• 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	• Pressure transducers 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

Variable Speed Drive Circuit	• Variable speed drive (VFD)
	• Line reactor 5%
	• Mode selector switch
	    • VFD
	    • Bypass

Audible Alarm	Alarm buzzer - 85dB at 3 meters
Visual Indications	• Power available • Deluge valve start • Pump on demand/Automatic start • VFD fault • Motor run • Remote automatic start • Pump room temperature (ºF or ºC) • VFD bypass • Periodic test • Remote manual start • Lockout • VFD Hertz • Manual start • Emergency start

Visual & Audible Alarms	Visual
	  • Control voltage not healthy • Overcurrent • Pump on demand
	  • Invalid cut-in • Overvoltage • Pump room alarm
	  • Lock rotor current • Phase loss L1 • Service required
	  • Loss of power • Phase loss L2 • Undercurrent
	  • Low ambient temperature • Phase loss L3 • Undervoltage
	  • Low water level • Phase unbalanced • Check weekly test solenoid
	  • Motor trouble • Pressure transducer fault detected • Weekly test cut-in reached
	  • Phase reversal (normal power)
	Visual and audible
	  • Fail to start

Remote Alarm Contacts	DPDT-8A-250V.AC
	    • Power available • Overpressure
	    • Phase reversal • Bypass mode
	    • Motor run • VFD failure
	    • Common pump room alarm (field re-assignable)**
	        • Overvoltage
	        • Undervoltage
	        • Phase unbalance
	        • Low pump room temperature
	        • High Pump room temperature
	    • Common motor trouble (field re-assignable)**
	        • Overcurrent
	        • Fail to start
	        • Undercurrent
	        • Ground fault

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

ViZiTouch V2.1 Operator Interface	• Embedded microcomputer with software PLC logic • 7.0" color touch screen (HMI technology) • Upgradable software • Multi-language
Communication Protocol Capability	• Protocol: Modbus • Connection type: Shielded female connector RJ45 • Frame Format: TCP/IP • Addresses: See Technical Bulletin - Modbus TCP/IP Communication Protocol for Electric Fire Pump Controllers

|			
Operation	**Automatic Start**	• Start on pressure drop • Remote start signal from automatic device • Deluge valve start	
	Manual Start	• Start pushbutton • Run test pushbutton • Remote start from manual device	
	Stopping	• Manual with Stop pushbutton • Automatic after expiration of minimum run timer ***	
	Timers	Field Adjustable & Visual Countdown	• Minimum run timer ***(off delay) • Sequential start timer (on delay) • Periodic test timer
	Actuation	Visual Indication	• Pressure • Non-pressure
	Mode		• Automatic • Non-automatic

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

October 2023

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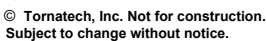
5

A4	Flow switch provision		C19	Emergency start alarm contact (DPDT)
A8	Foam pump application w/o pressure transducer and run test solenoid valve.		C20	Manual start alarm contact (DPDT)
A9	Low zone pump control function		C21	Deluge valve start alarm contact (DPDT)
A10	Middle zone pump control function		C22	Remote automatic start alarm contact (DPDT)
A11	High zone pump control function		C23	Remote manual start alarm contact (DPDT)
A13	Non-pressure actuated controller w/o pressure transducer and run test solenoid valve		C24	High pump room temperature alarm contact (DPDT)
A16	Lockout/interlock circuit from equipment installed inside the pump room		C25	Second set of standard alarm contacts (DPDT) (Typical for city of Los Angeles and Denver)
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		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
B11B	Built in alarm panel same as B11 but 220-240VAC supervisory power		D1A	Low suction pressure transducer for sea water rated at 0-300PSI with visual indication and alarm contact
B19A	High motor temperature c/w thermoster relay and alarm contacts (DPDT)		D5	Pressure transducer and run test solenoid valve for fresh water rated for 0-500PSI (for factory calibration purposes only)
B19B	High motor temperature c/w PT100 relay and alarm contacts (DPDT)		D5D	Pressure transducer and run test solenoid valve for sea water rated for 0-500PSI
B21	Ground fault alarm detection c/w visual indication and alarm contact (DPDT)		D14	Anti-condensation heater & thermostat
C1	Extra motor run alarm contact (DPDT)		D14A	Anti-condensation heater & humidistat
C4	Periodic test alarm contact (DPDT)		D14B	Anti-condensation heater & thermostat & humidistat
C6	Low discharge pressure alarm contact (DPDT)		D15	Tropicalization
C7	Low pump room temperature alarm contact (DPDT)		D26	Modbus with RTU frame format and RS485 connection
C10	Low water reservoir level alarm contact (DPDT)		D27	Motor heater connection (external single phase power source and heater on/off contact)
C11	High electric motor temperature alarm contact (DPDT)		D27A	Motor heater connection (internal single phase power source and heater on/off contact)
C12	High electric motor vibration c/w visual indication and alarm contact (DPDT)		D28	Customized drawing set
C14	Pump on demand / automatic start alarm contact (DPDT)		D34A	Field programmable I/O board - 5 Input / 5 output
C15	Pump fail to start alarm contact (DPDT)		D36	Redundant pressure transducer for fresh water rated for 0-500PSI
C16	Control voltage healthy alarm contact (DPDT)		D36A	Redundant pressure transducer for sea water rated for 0-500PSI
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)			

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

ViZiTouch V2.1 Operator Interface
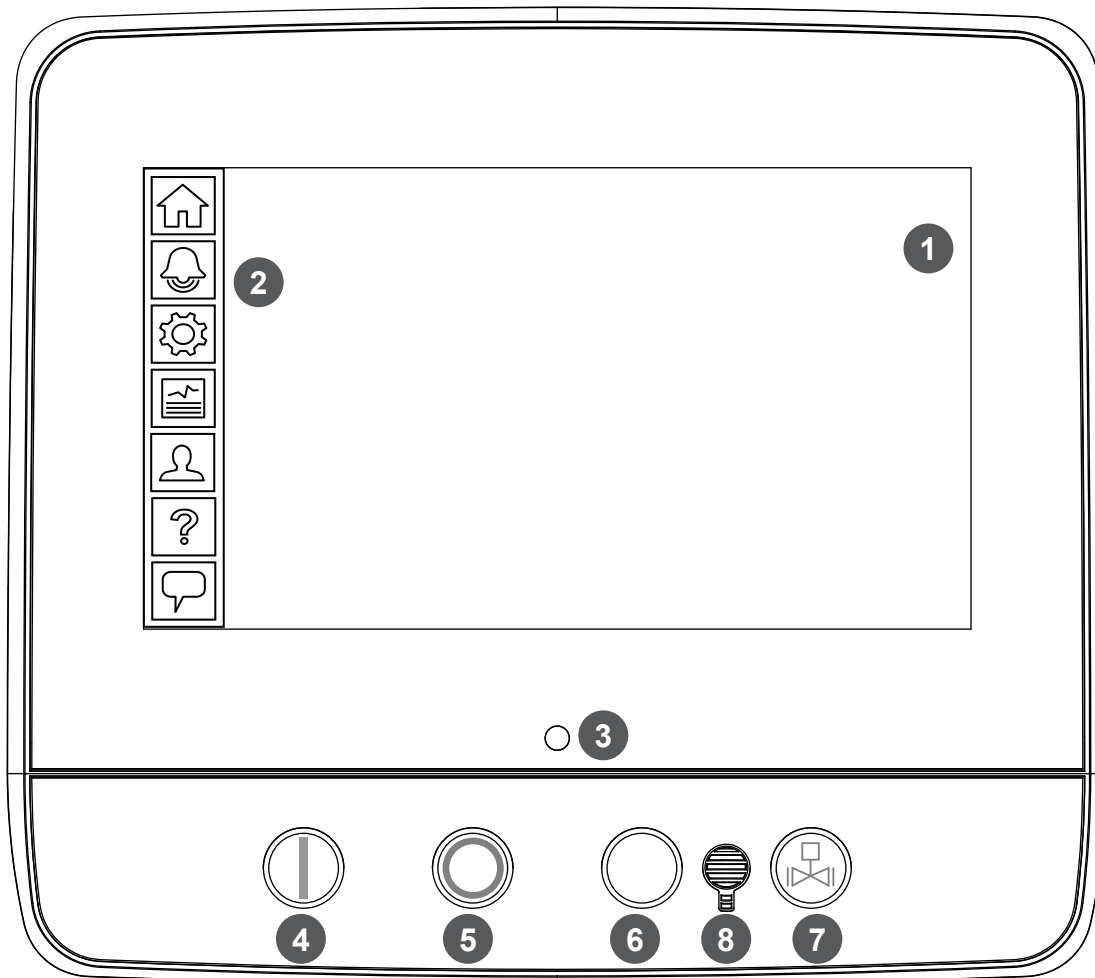
1 - Color touch screen
2 - Onscreen menu
   • HOME page
   • ALARM page
   • CONFIGURATION page
   • HISTORY page
   • SERVICE page
   • MANUAL page
   • LANGUAGES page

3 - Power LED (3 colors)
4 - START button
5 - STOP button
6 - Not Used
7 - RUN TEST button
8 - Alarm buzzer

	BY	DD/MM/YY
DRAWN BY	ZS	10/07/23
FINAL APPROVAL	FC	10/07/23

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ELECTRIC FIRE PUMP CONTROLLER

MODEL: VPA / VPS

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70
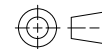
THIRD ANGLE PROJECTION

DRAWING NUMBER: VPX-DI805 /E
DWG REV. 0
SHEET 1 OF 1

Notes:
- Standard: NEMA 12
- Standard paint : textured red RAL 3002.
- All dimensions are in inches [millimeters].
- Center of screen: 29-5/8" [751] from bottom (no feet).
- Side conduit entrance through removable gland plate recommended.
- Use watertight conduit and connector only.
- Protect equipment against drilling chips.
- Door swing equal to door width.
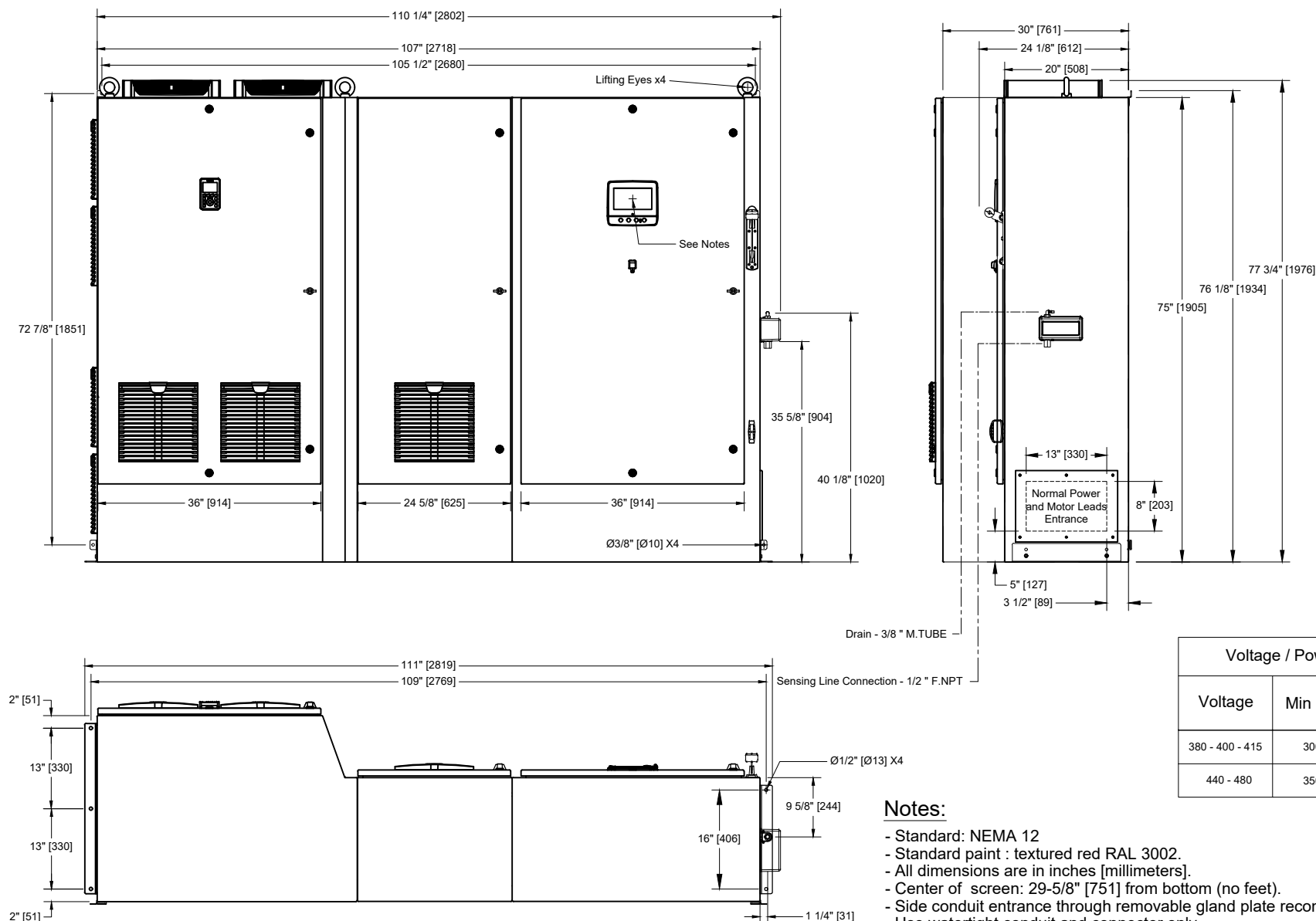
Voltage / Power Table		
Voltage	Min HP	Max HP
380 - 400 - 415	300	350
440 - 480	350	450

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**ELECTRIC FIRE PUMP CONTROLLER
VARIABLE SPEED / SOFT STARTER BYPASS
STARTING**

MODEL: VPS
BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

DRAWING NUMBER
VPS-WS800 /E
DWG REV. 0
SHEET 1 OF 4

To I/O
Electric Board
UP
(P.2 / E2)

VMB1
ViZi TOUCH

J14   J8   J5

3L1 (P.1/E6, P.2/B8, P.4/B4)

3L2 (P.1/E7, P.2/B8, P.4/B4)

L1-L2-L3
To
(P.2/E8)

VFD   Bypass
SS1
211   212

(P.1/C2)   (P.1/F2)
3L1   3L2

XTR4
44   X2   X1
120V

50   CR5   47   (P.2/H2)
46   (P.2/H2)

CR4   49

CL1   LI1   LI2   COM   CL2

R1B / R1C / R1A   RUN / TRIP (Programmable)   NO

R2B / R2C / R2A   195 / 198   OVERLOAD / FAILURE (Fail Safe)   NC / NO
(P.2/H5)

ATS22....6SU

** Contact closes when emergency start is in "ON" position.

	Legend
R	Contactor
CB	Circuit Breaker
CR	Control Relay
CT	Current Transformer
EB	Electric I/O Board
EXB	Expansion Board
F	Ferrite
FAN	Cooling Fan
FU	Fuse
IS	Isolating Switch
J	Jumper
LS	Limit Switch
LR	Line Reactor
PS	Power Supply
PT	Pressure Transducer
SA	Surge Arrester
SSS	Soft Starter
ST	Shunt Trip
SV	Solenoid Valve
VMB	Main Board
XTR	Transformer
VFD	Variable Frequency Drive

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ELECTRIC FIRE PUMP CONTROLLER VARIABLE SPEED / SOFT STARTER BYPASS STARTING

MODEL: VPS
BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

DRAWING NUMBER: VPS-WS800 /E
DWG REV. 0
SHEET 2 OF 4

(P.1/C2) (P.1/F2)
3L1 3L2

FU3
244 245
H1 H2
XTR5
X2 X1
236 240V 239

Fan(s)
FU5
239 FAN1 238 2R 237

SV1
Brown Blue

LS1**
LS1-1
LS1-2

Sensing Line Connection

PT1

To VFD1 (AQ2) (P.4 / G6)
275 273

To VFD1 (AQ1) (P.4 / G6)
274 273

Red White Black

(P.1 / B8) To VMB1 I/O
(P.3 / B4) To EXB1 UP

F2
UP
DOWN

To ST1 (P.1 / C1)

SV1-1 SV1-2

1 XTR1
X1 H2
24VAC
X2 H1
3L2
3 3L1

CR4
CR4-1 CR4-2

CR5
CR5-1 CR5-2

To CT1-2-3 (P.1 / G2)

To 3L1-2-3 (P.1 / D1)

To CR4 (P.1 / G2)

I/O Electric Board

EB1

J14	J15	J16	J17	J54
+ AI4 -	+ AI3 -	+ AI2 -	+ AI1 -	LS1

J46	J43	J45	J44	J47	J36 CR4	J38 CR5	J76	J53	J4	J3	J2
AB	SV	ST	24V IN / 24V OUT	24VAC	NC C NO	NC C NO	IGF I3 I2 I1		L3	L2	L1

3L3 3L2 3L2 3L1 3L1

J40 TB1	J42 TB2	J37 TB3	J39 TB4	J41 TB5	J55 TB6
NO C NC	NO C NC	NO C NC	NO C NC	NO C NC	NO C NC
NO C NC	NO C NC	NO C NC	NO C NC	NO C NC	NO C NC

47 46
(P.1/F5)

Motor Run
Power Available
Normal Power Phase Reversal
Pump Room Alarm
Motor Trouble

J25

IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8

J1* J2*

191 192 193 194 198 195
(P.1/H3)

Remote Manual
Lockout
Remote Auto
Deluge Valve
Low Water Level

VFD Ready CR47
VFD Fault CR48

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

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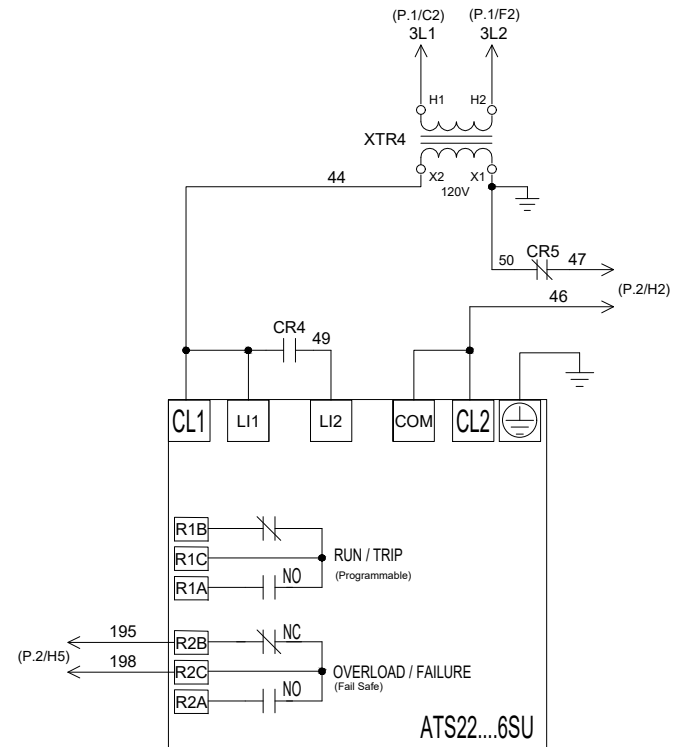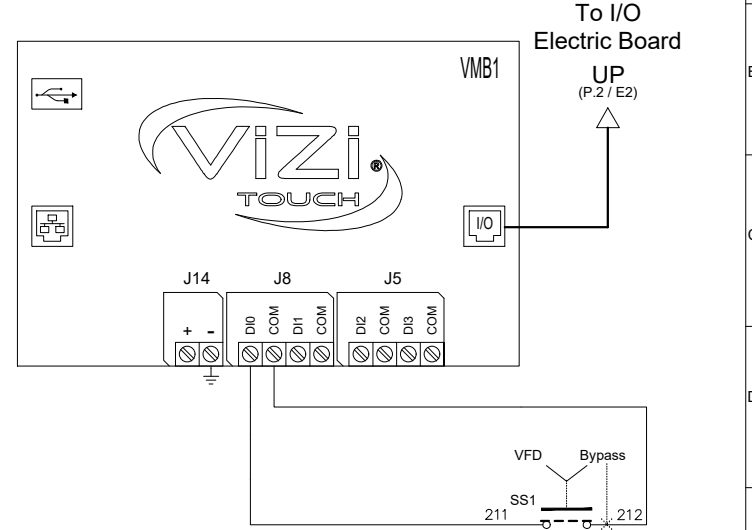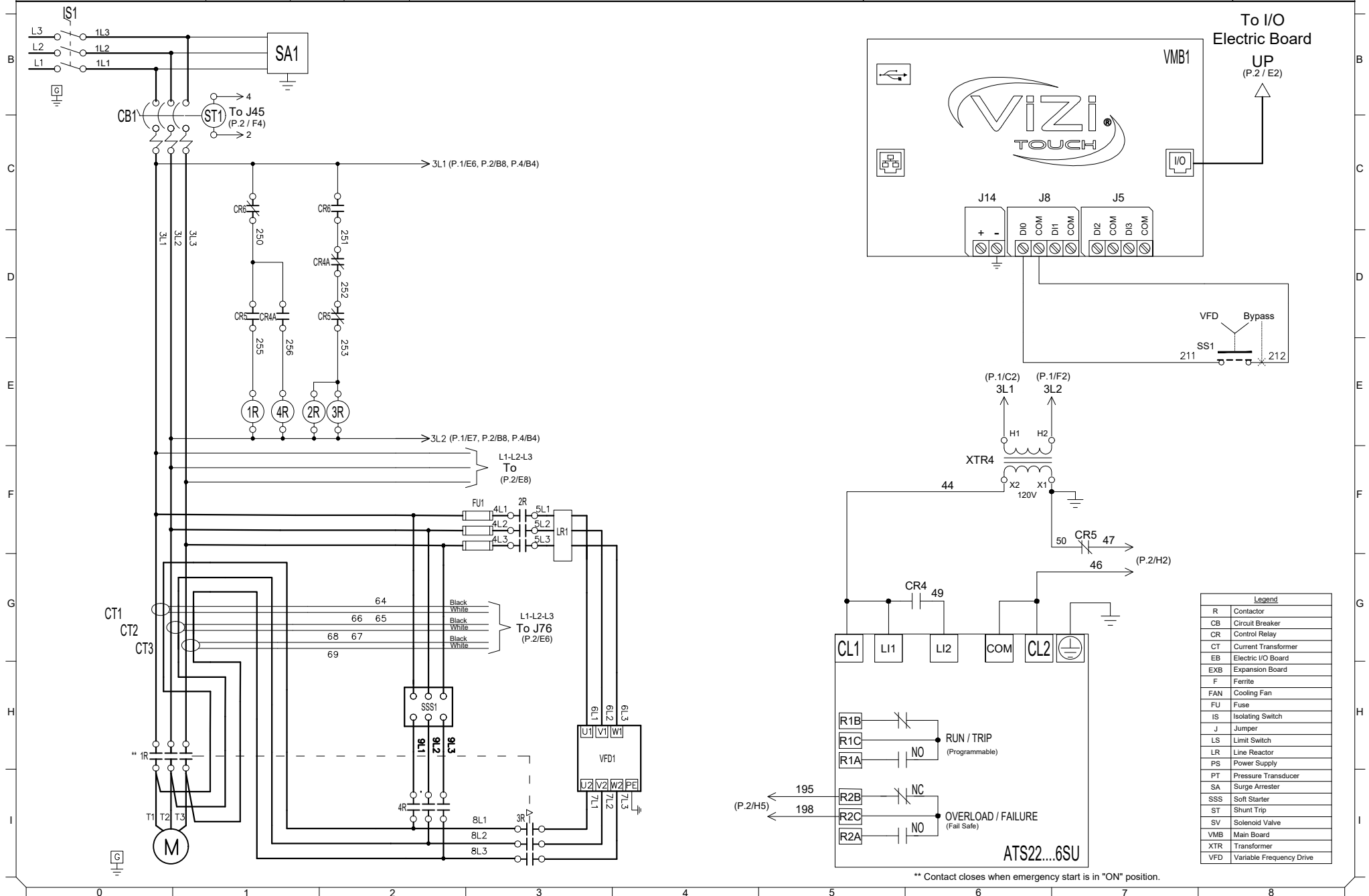|	BY	DD/MM/YY
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ELECTRIC FIRE PUMP CONTROLLER VARIABLE SPEED / SOFT STARTER BYPASS STARTING

MODEL: VPS
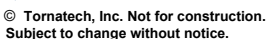BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

DRAWING NUMBER
VPS-WS800 /E
DWG REV. 0
SHEET 3 OF 4

To EB1 DOWN (P.1 / F4)

Expansion Board 1

VFD Power — LS2*** — CR6 — 105 (P.4 / C3) — 104 / 106

TB1 — 1 — 2 — NO / C / NC

VFD Start/Stop — CR7 — 105 (P.4 / C3) — 104 / 107

TB2 — NO / C / NC

CR4A — 105 (P.4 / C3) — 104 / 107

TB3 — NO / C / NC

Programmable Outputs

VFD Alarm Reset (P.4/E2) — 104 / 279

TB4 — NO / C / NC

VFD Constant Speed Enable (P.4/E2) — 104 / 280

TB5 — NO / C / NC

J12 — 24VDC EXT

UP

DOWN

EXB1

J9 — IN1 / IN2 / IN3 / IN4 / IN5

Programmable Inputs

Expansion Board 2

Bypass Mode — TB1 — 1 — 2 — NO / C / NC

VFD Failure — TB2 — NO / C / NC

Overpressure — TB3 — NO / C / NC

Programmable Outputs

TB4 — NO / C / NC

TB5 — NO / C / NC

J12 — 24VDC EXT

UP

DOWN

EXB2

J9 — IN1 / IN2 / IN3 / IN4 / IN5

Programmable Inputs

*** Contact opens when emergency start is in "ON" position

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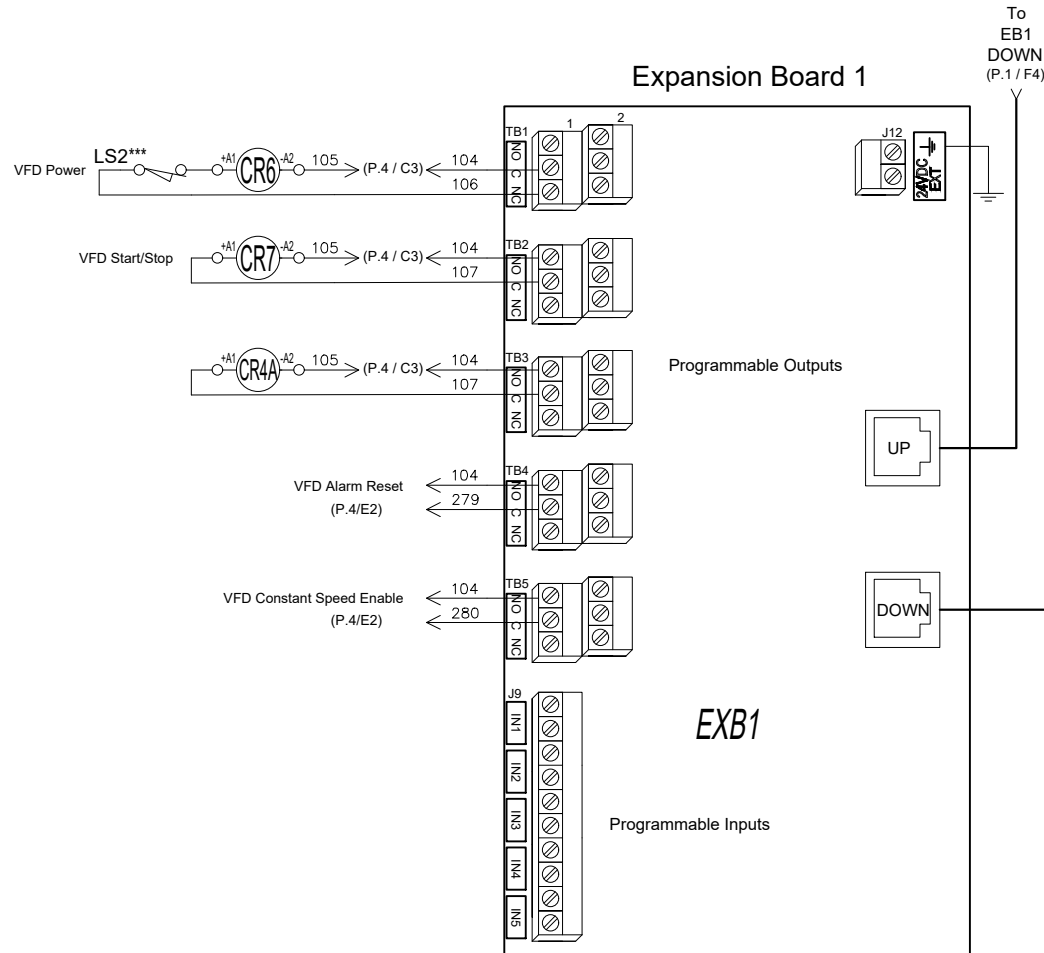
ELECTRIC FIRE PUMP CONTROLLER VARIABLE SPEED / SOFT STARTER BYPASS STARTING

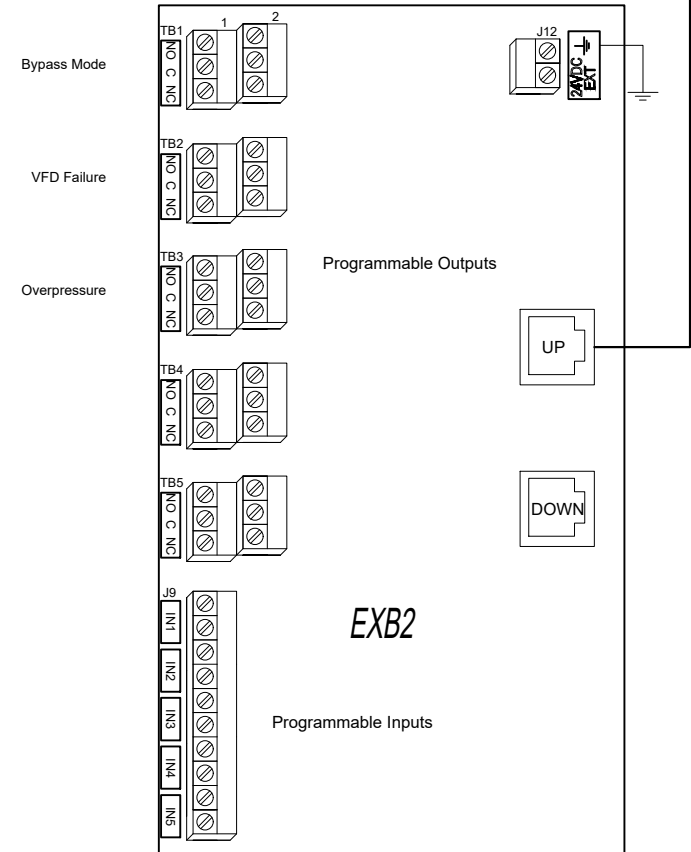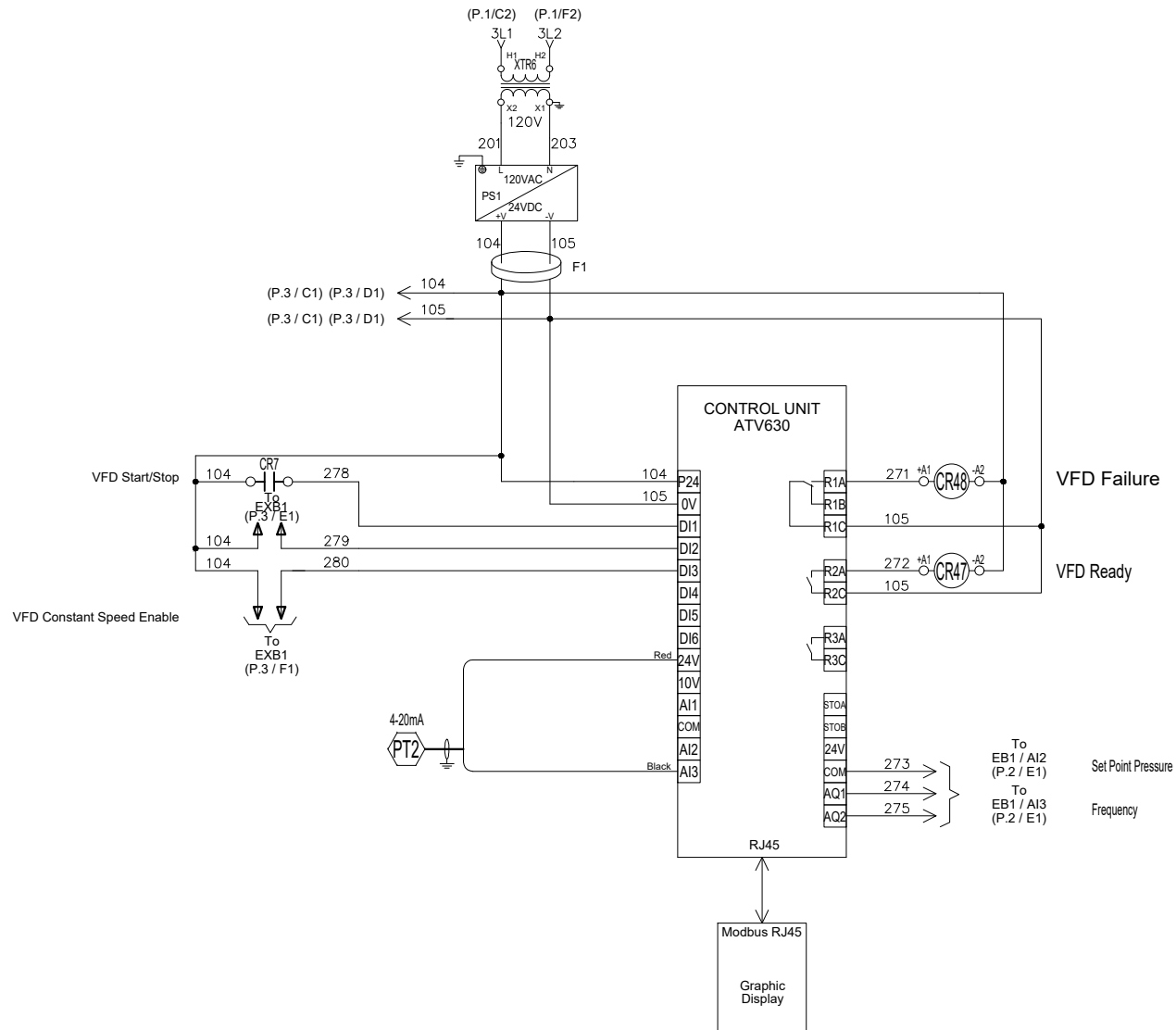**MODEL: VPS**
BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

DRAWING NUMBER
VPS-WS800 /E
DWG REV. 0
SHEET 4 OF 4

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FINAL APPROVAL	FC	10/07/23

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ELECTRIC FIRE PUMP CONTROLLER

MODEL: VPA / VPS
BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

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

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)			12 " (305 mm)	
HP / Voltage	5	7.5	10	15	20	25	30	40	50	60	75	100
200	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)	2x (1/0 to 500)	--------
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)	2x (1/0 to 500)	2x (2/0 to 500)
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)	1x (250)	2x (2/0 to 500)
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)	1x (1/0 to 3/0)	1x (3/0 to 250)
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)	1x (1 to 3/0)	1x (2/0 to 3/0)
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)	1x (3 to 1/0)	1x (1 to 3/0)
											5 " (127 mm)	8 " (203 mm)
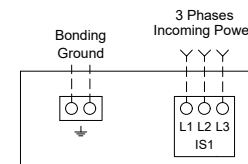
Bending Space	12 " (305 mm)		16 " (406 mm)					
HP / Voltage	125	150	200	250	300	350	400	450
380 to 416	1x (250)	2x (1/0 to 500)	2x (3/0 to 500)	2x (4/0 to 500)	2x (300 to 500)	2x (400 to 500)	--------	--------
440 to 480	1x (3/0 to 250)	1x (4/0 to 250)	2x (1/0 to 500)	2x (3/0 to 500)	2x (4/0 to 500)	2x (300 to 500)	2x (350 to 500)	2x (400 to 500)
Bending Space	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)	12 " (305 mm)	
HP / Voltage	5	7.5	10	15	20	25	30	40	50	60	75	100
200	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 *	2x (2/0 to 500)	--------
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 *	2x (2/0 to 500)	2x (4/0 to 500)
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)	1x (350) ** N/A	2x (3/0 to 500)
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)	1x (3/0)	1x (250 to 350)
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)	1x (1/0 to 3/0)	1x (3/0)
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)	1x (1 to 1/0)	1x (2/0 to 3/0)
											5 " (127 mm)	8 " (203 mm)

Bending Space	12 " (305 mm)		16 " (406 mm)					
HP / Voltage	125	150	200	250	300	350	400	450
380 to 416	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 *	--------	--------
440 to 480	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 *
Bending Space	8 " (203 mm)		12 " (305 mm)					

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

** Consult Factory

Power Terminals

Bonding Ground

3 Phases Incoming Power

L1 L2 L3
IS1

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 ZS sequence.

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

TORNATECH

	BY	DD/MM/YY
DRAWN BY	ZS	10/07/23
FINAL APPROVAL	FC	10/07/23

ELECTRIC FIRE PUMP CONTROLLER

MODEL: VPA / VPS
BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

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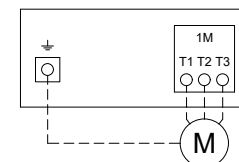VPX-TD801 /E
DWG REV. 0
SHEET 1 OF 1

COPPER CONDUCTORS for Motor Connection (1M).
Field Wiring According to Bending Space (AWG or MCM). Terminals T1 - T2 - T3

HP / Voltage	5	7.5	10	15	20	25	30	40	50	60	75	100
200	1x (10 to 2)	1x (8 to 2)	1x (8 to 2)	1x (6 to 2)	1x (4 to 2)	1x (3 to 2/0)	1x (2 to 2/0)	1x (1/0 to 3/0)	1x (3/0)	1x (4/0 to 300)	1x (300)	--------
208	1x (10 to 2)	1x (8 to 2)	1x (8 to 2)	1x (6 to 2)	1x (4 to 2)	1x (3 to 2/0)	1x (2 to 2/0)	1x (1/0 to 3/0)	1x (3/0)	1x (4/0 to 300)	1x (300)	2x (2/0 to 300)
220 to 240	1x (10 to 2)	1x (10 to 2)	1x (8 to 2)	1x (6 to 2)	1x (4 to 2)	1x (4 to 2/0)	1x (3 to 2/0)	1x (1/0 to 3/0)	1x (2/0 to 3/0)	1x (3/0)	1x (250 to 300)	2x (2/0 to 300)
380 to 416	1x (10 to 2)	1x (10 to 2)	1x (10 to 2)	1x (8 to 2)	1x (8 to 2)	1x (6 to 2)	1x (6 to 1/0)	1x (4 to 2)	1x (3 to 2/0)	1x (1 to 2/0)	1x (1/0 to 3/0)	1x (3/0)
440 to 480	1x (10 to 2)	1x (10 to 2)	1x (10 to 2)	1x (10 to 2)	1x (8 to 2)	1x (8 to 2)	1x (6 to 2)	1x (6 to 2)	1x (4 to 2/0)	1x (3 to 2/0)	1x (1 to 1/0)	1x (2/0 to 3/0)
600	1x (10 to 2)	1x (10 to 2)	1x (10 to 2)	1x (10 to 2)	1x (8 to 2)	1x (8 to 2)	1x (8 to 2)	1x (6 to 2)	1x (6 to 2)	1x (4 to 2/0)	1x (3 to 1/0)	1x (1 to 1/0)

HP / Voltage	125	150	200	250	300	350	400	450
380 to 416	1x (250 to 300)	1x (300)	2x (3/0 to 300)	2x (4/0 to 300)	2x (300)	2x (400 to 500)	--------	--------
440 to 480	1x (3/0)	1x (4/0 to 300)	2x (1/0 to 300)	2x (3/0 to 300)	2x (4/0 to 300)	2x (300)	2x (350 to 500)	2x (400 to 600)

Motor Terminals

1M
T1 T2 T3

M

Models: VPA / VPS

ALUMINUM CONDUCTORS for Contactor (1M).
Field Wiring According to Bending Space (AWG or MCM). Terminals T1 - T2 - T3

HP / Voltage	5	7.5	10	15	20	25	30	40	50	60	75	100
200	1x (10 to 2/0) **	1x (10 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) **	1x (2/0) 90°C *	Consult Factory	1x (300)	1x (300) 90°C *	--------
208	1x (10 to 2/0) **	1x (10 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) **	1x (2/0) 90°C *	Consult Factory	1x (300)	1x (300) 90°C *	2x (4/0 to 300)
220 to 240	1x (10 to 2/0) **	1x (10 to 2/0) **	1x (8 to 2/0) **	1x (4 to 2/0) **	1x (3 to 2/0) **	1x (2 to 2/0) **	1x (1 to 2/0) **	1x (2/0)	1x (3/0) 90°C *	Consult Factory	1x (300) 90°C *	2x (3/0 to 300)
380 to 416	1x (12 to 2/0) **	1x (12 to 2/0) **	1x (10 to 2/0) **	1x (8 to 2/0) **	1x (6 to 2/0) **	1x (6 to 2/0) **	1x (4 to 2/0) **	1x (2 to 2/0) **	1x (1 to1/0)	1x (1/0)	1x (3/0)	Consult Factory
440 to 480	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 (6 to 2/0) **	1x (6 to 2/0) **	1x (4 to 2/0) **	1x (2 to 1/0)	1x (1 to 1/0)	1x (1/0)	1x (3/0)
600	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 (4 to 2/0) **	1x (4 to 2/0) **	1x (2 to 1/0)	1x (1 to 1/0)	Consult Factory

HP / Voltage	125	150	200	250	300	350	400	450
380 to 416	1x (300) 90°C *	Consult Factory	2x (4/0 to 300)	2x (300)	Consult Factory	2x (600)	--------	--------
440 to 480	Consult Factory	1x (300)	2x (3/0 to 300)	2x (250 to 300)	2x (300)	2x (300) 90°C *	2x (500)	2x (600)

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

**Option V659 required.

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 ZS sequence.

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ELECTRIC FIRE PUMP CONTROLLER

MODEL: VPS
BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

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

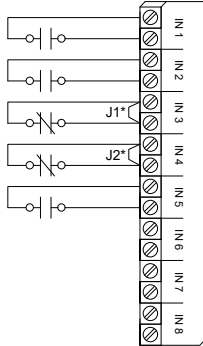## Field Connections

Terminals Wire Size:
24 - 12 AWG
0.5 Nm

I/O Electric Board

- Remote Manual — IN 1
- Lockout — IN 2
- Remote Auto — J1* — IN 3
- Deluge Valve — J2* — IN 4
- Low Water Level — IN 5
- IN 6
- IN 7
- IN 8

Controller Terminal Strip

J25

Network Connections

Terminals Wire Size:
Shielded Female Connector RJ45

Modbus TCP/IP RJ45 — Located on Main Board

Alarm Contacts

Terminals Wire Size:
24 - 12 AWG
0.5 Nm

I/O Electric Board

Motor Run
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm — TB1

Power Available
- Normally Closed Opens to alarm { NO, C, NC }
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm — TB2

Normal Power Phase Reversal
- Normally Closed Opens to alarm { NO, C, NC }
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm — TB3

Pump Room Alarm
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm — TB4

Motor Trouble
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm
- Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm — TB5

Terminals Wire Size:
24 - 12 AWG
0.5 Nm

Expansion Board 2

Bypass Mode
- Normally Closed Opens to alarm / Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm / Normally Opened Closes to alarm { NO, C, NC } — TB1

VFD Failure
- Normally Closed Opens to alarm / Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm / Normally Opened Closes to alarm { NO, C, NC } — TB2

Overpressure
- Normally Closed Opens to alarm / Normally Opened Closes to alarm { NO, C, NC }
- Normally Closed Opens to alarm / Normally Opened Closes to alarm { NO, C, NC } — TB3

* Remove jumper to use this feature