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

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.
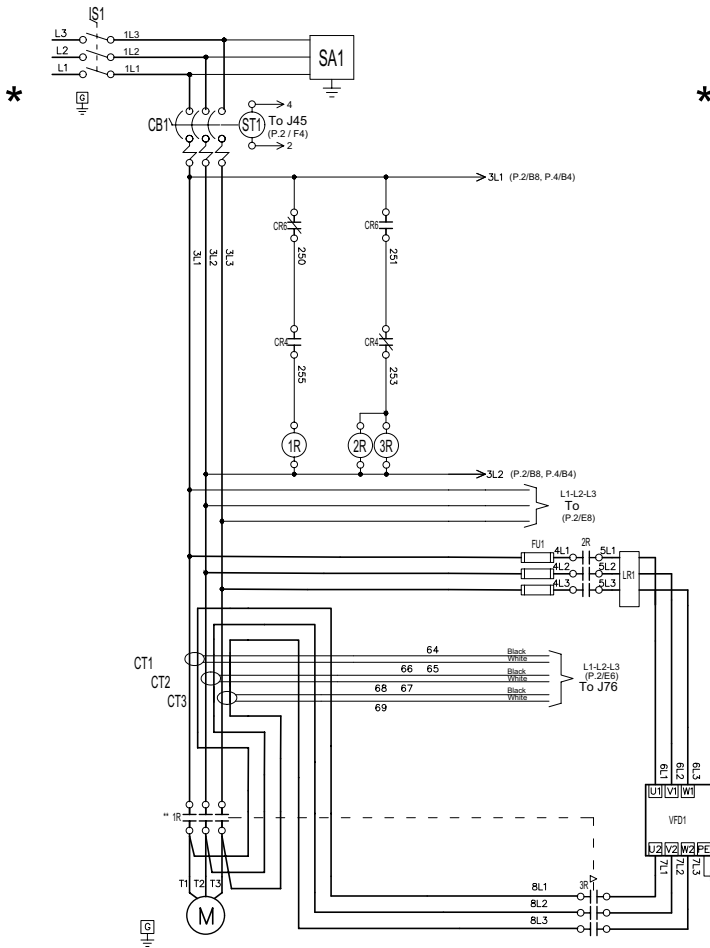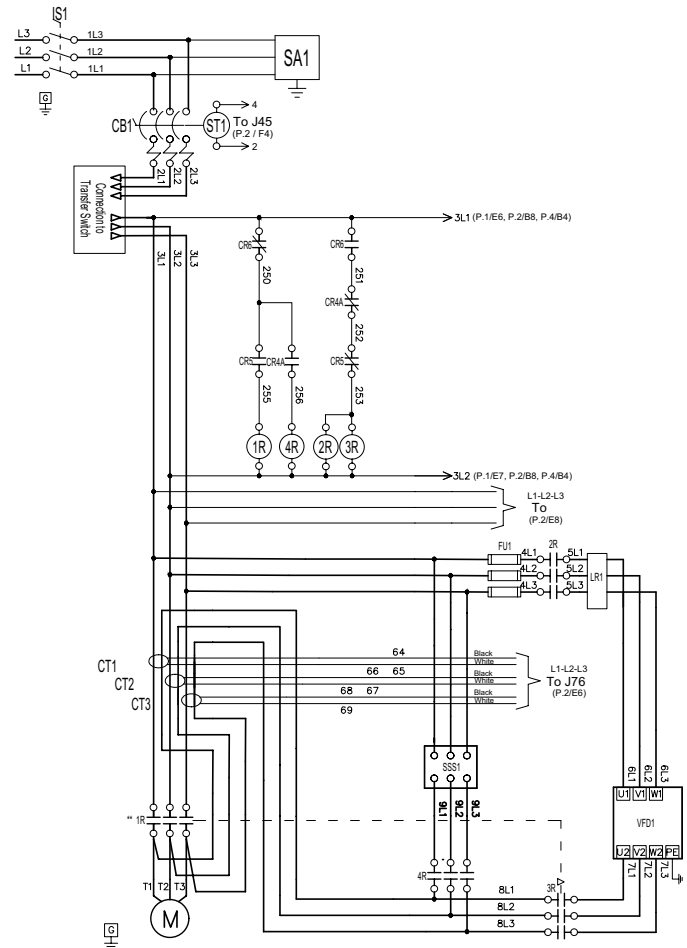
cULus   FM APPROVED

May 2024

Select Bypass starting method

Model VPA
Across the line

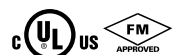## Model VPS
Soft Start Soft Stop

*From normal incoming power through Disconnecting Means (IS/CB)
*For Disconnecting Means details see page 3

May 2024

This is a Marketing document. Please consult factory for more information.
Manufacturer reserves the right to modify this information without notice

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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
	    • Phase reversal
	    • Motor run
	    • 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
	
	    • Overpressure
	    • Bypass mode
	    • VFD failure

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

May 2024

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4

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

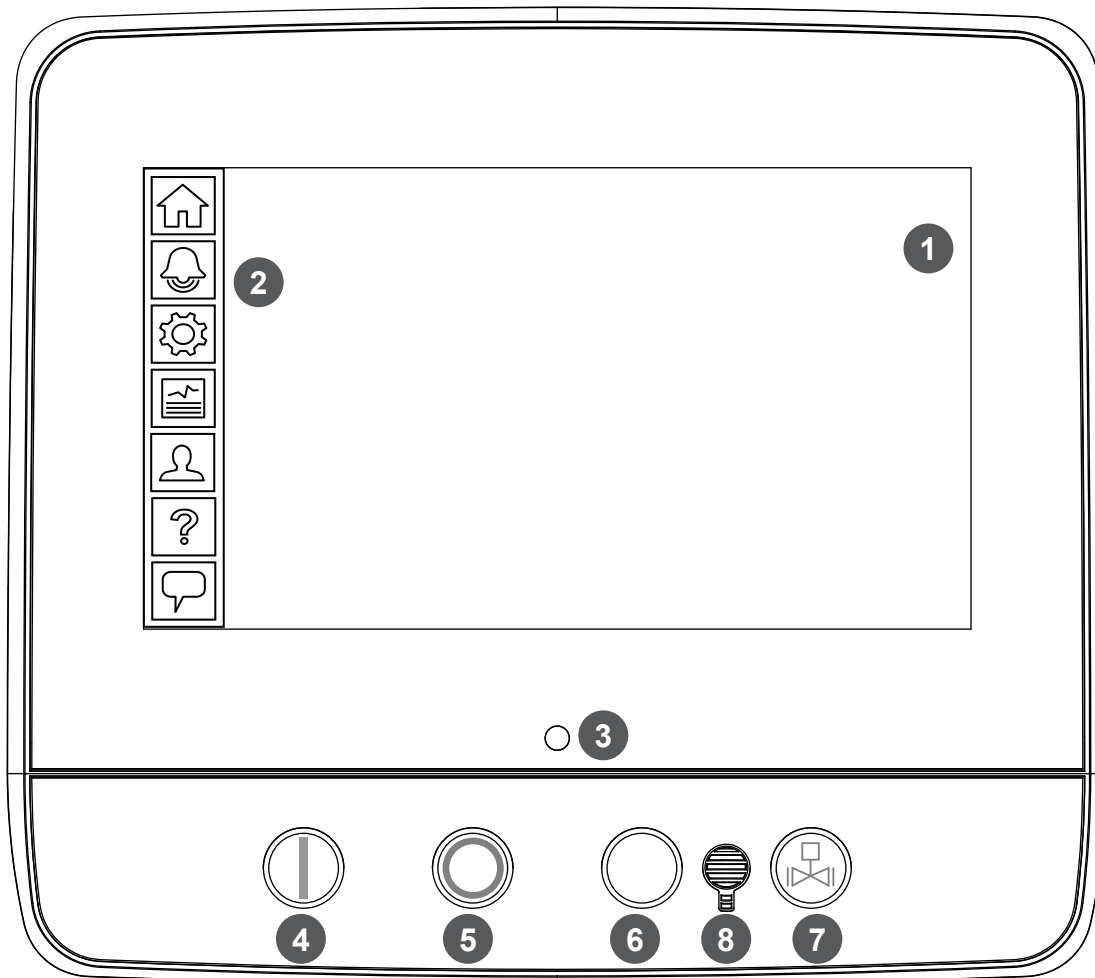***Can only be used if approved by the AHJ

A4	Flow switch provision	C20	Manual start alarm contact (DPDT)
A8	Foam pump application w/o pressure transducer and run test solenoid valve.	C21	Deluge valve start alarm contact (DPDT)
A9	Low zone pump control function	C22	Remote automatic start alarm contact (DPDT)
A10	Middle zone pump control function	C23	Remote manual start alarm contact (DPDT)
A11	High zone pump control function	C24	High pump room temperature alarm contact (DPDT)
A13	Non-pressure actuated controller w/o pressure transducer and run test solenoid valve	C25	Second set of standard alarm contacts (DPDT) (Typical for city of Los Angeles and Denver)
A16	Lockout/interlock circuit from equipment installed inside the pump room	Cx	Additional visual and alarm contact (Specify function) (DPDT)
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	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
B11B	Built in alarm panel same as B11 but 220-240VAC supervisory power	D5	Pressure transducer and run test solenoid valve for fresh water rated for 0-500PSI (for factory calibration purposes only)
B19A	High motor temperature c/w thermoster relay and alarm contacts (DPDT)	D5D	Pressure transducer and run test solenoid valve for sea water rated for 0-500PSI
B19B	High motor temperature c/w PT100 relay and alarm contacts (DPDT)	D14	Anti-condensation heater & thermostat
		D14A	Anti-condensation heater & humidistat
B21	Ground fault alarm detection c/w visual indication and alarm contact (DPDT)	D14B	Anti-condensation heater & thermostat & humidistat
C1	Extra motor run alarm contact (DPDT)	D15	Tropicalization
C4	Periodic test alarm contact (DPDT)	D26	Modbus with RTU frame format and RS485 connection
C6	Low discharge pressure alarm contact (DPDT)	D27	Motor heater connection (external single phase power source and heater on/off contact)
C7	Low pump room temperature alarm contact (DPDT)	D27A	Motor heater connection (internal single phase power source and heater on/off contact)
C10	Low water reservoir level alarm contact (DPDT)	D28	Customized drawing set
C11	High electric motor temperature alarm contact (DPDT)	D34A	Field programmable I/O board - 5 Input / 5 output
C12	High electric motor vibration c/w visual indication and alarm contact (DPDT)	D36	Redundant pressure transducer for fresh water rated for 0-500PSI
C14	Pump on demand / automatic start alarm contact (DPDT)	D36A	Redundant pressure transducer for sea water rated for 0-500PSI
C15	Pump fail to start alarm contact (DPDT)	D43	Seismic Certification compliant to CBC 2019, IBC 2018 rigid base/wall mounted only
C16	Control voltage healthy alarm contact (DPDT)	D44	Special Seismic Certification compliant to OSHPD rigid base/wall mounted only
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)		

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

ELECTRIC FIRE PUMP CONTROLLER

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

THIRD ANGLE PROJECTION

DRAWING NUMBER
VPX-DI803 /E
DWG REV. 0
SHEET 1 OF 1

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75 1/4" [1913]
72" [1829]
70 1/2" [1791]
Ø3/8" [Ø10] X4
21 3/4" [554]
18" [457]
Ø7/8" [Ø23] X2

See Notes

65 7/8" [1673]
70 3/4" [1798]
69 1/8" [1756]
68" [1727]

33 5/8" [854]
33 5/8" [854]
28 1/2" [723]
23 7/8" [607]

Drain - 3/8 " M.TUBE
Sensing Line Connection - 1/2 " F.NPT

76" [1930]
74" [1880]
1" [25]
11" [279]
Ø1/2" [Ø13] X4
8 5/8" [218]
16" [406]
11" [279]
Normal Power and Motor Leads Entrance
1" [25]
3 1/2" [89]
3" [76]
1 1/4" [31]

Voltage / Power Table

Voltage	Min HP	Max HP
200	40	75
208 - 240	40	100
380 - 400 - 415	50	150
440 - 480	60	200
600	75	100

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).
- Bottom conduit entrance through removable gland plate recommended.
- Use watertight conduit and connector only.
- Protect equipment against drilling chips.
- Door swing equal to door width.

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ELECTRIC FIRE PUMP CONTROLLER
VARIABLE SPEED / ACROS THE LINE
BYPASS STARTING

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

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

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

IS1

L3 — 1L3
L2 — 1L2
L1 — 1L1

SA1

G

CB1
ST1 → 4 To J45 (P.2 / F4)
→ 2

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

3L1 3L2 3L3

CR6 — 250   CR6 — 251

CR4 — 255   CR4 — 253

1R   2R 3R

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

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

VMB1

ViZi TOUCH

I/O

J14   J8   J5
+ —   DI0 COM DI1 COM   DI2 COM DI3 COM

VFD   Bypass
SS1
211 ————— 212

FU1   2R
4L1 — 5L1
4L2 — 5L2   LR1
4L3 — 5L3

CT1
CT2
CT3

64   Black / White
66 65 Black / White
68 67 Black / White
69   Black / White

L1-L2-L3
(P.2/E6)
To J76

6L1 6L2 6L3
L1 L2 L3
VFD1
T1 T2 T3 PE
7L1 7L2 7L3

** 1R
T1 T2 T3

M

8L1   3R
8L2
8L3

G

	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	

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

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

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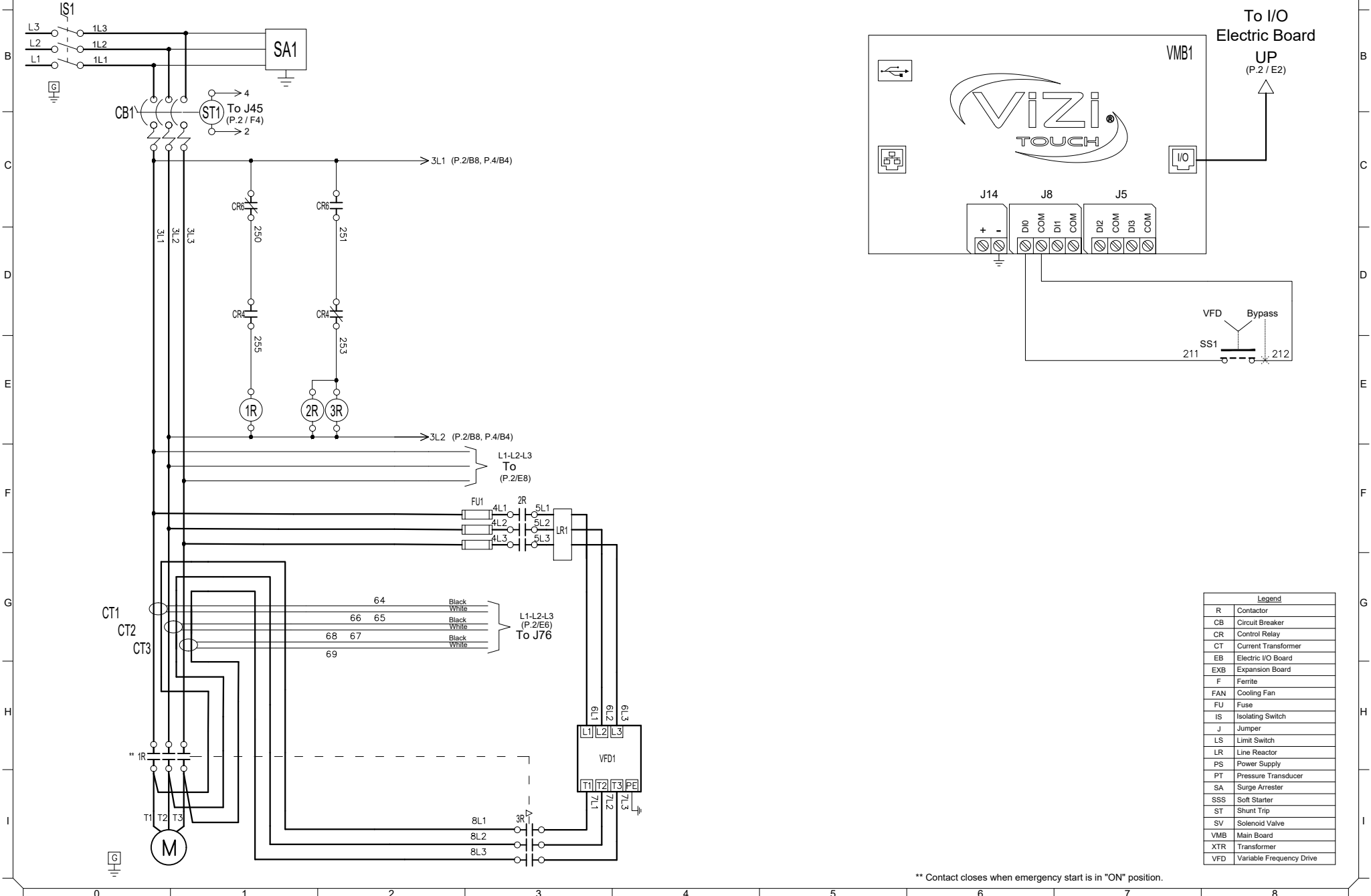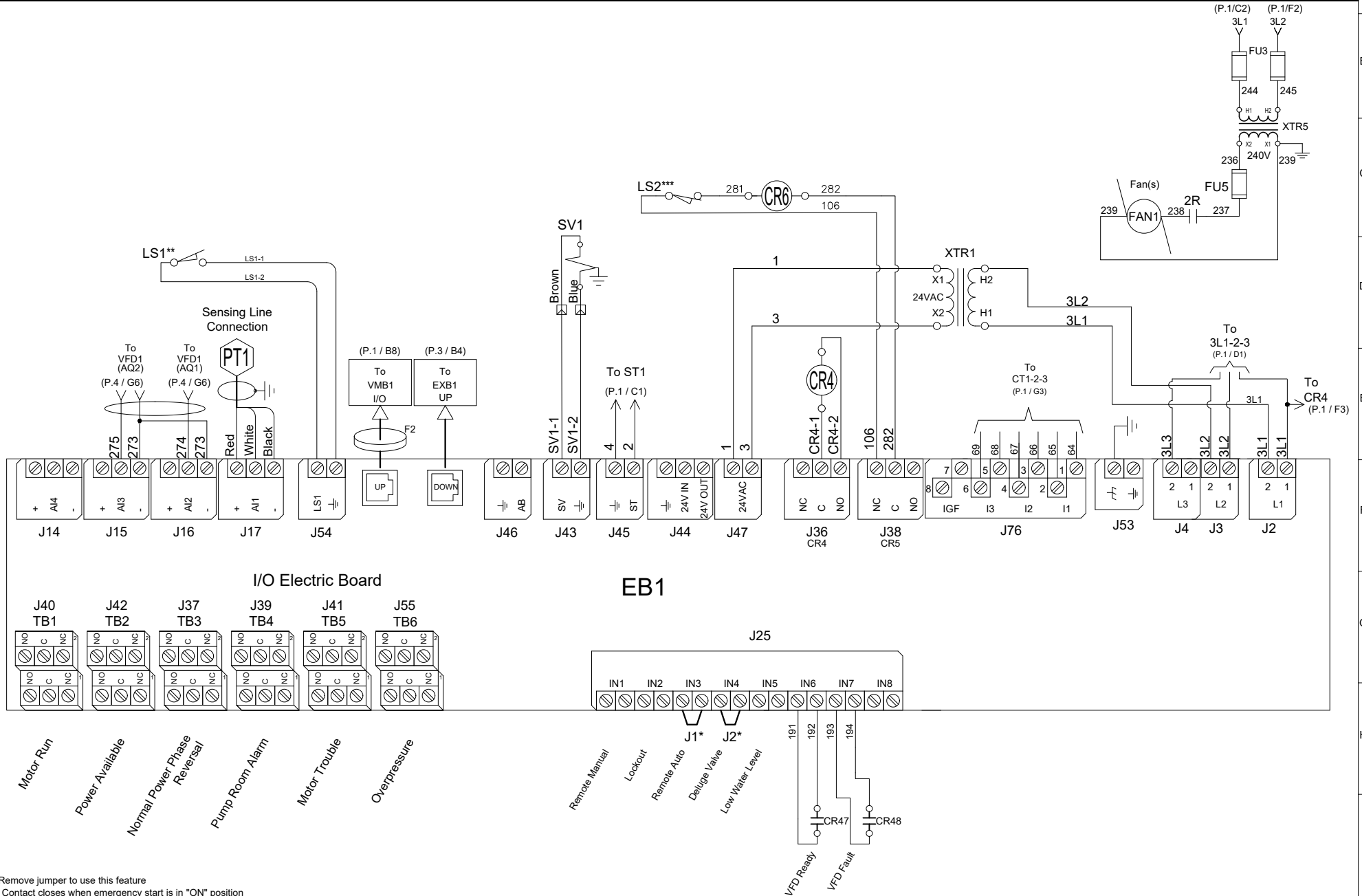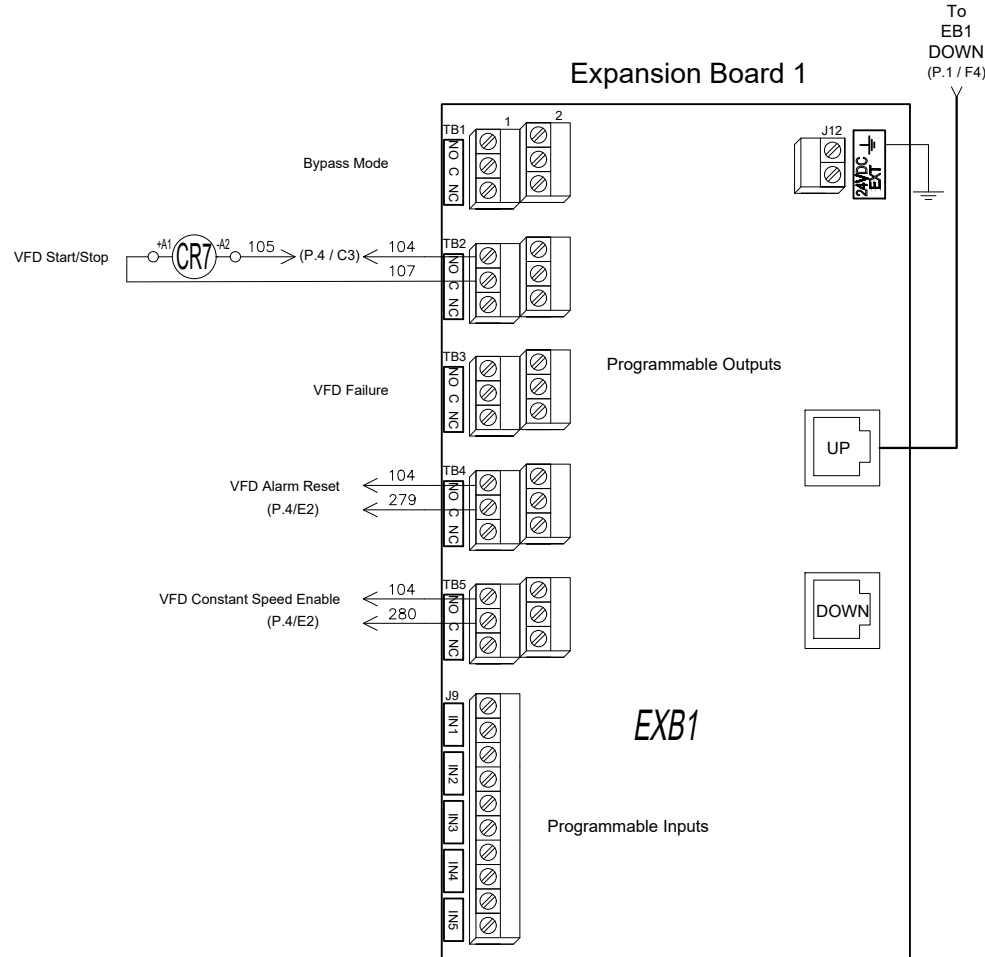Subject to change without notice.

**ELECTRIC FIRE PUMP CONTROLLER
VARIABLE SPEED / ACROS THE LINE
BYPASS STARTING**

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

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

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

FU3 244 245

XTR5 236 240V 239

Fan(s) FU5 2R
239 FAN1 238 237

LS2*** 281 CR6 282 106

SV1 Brown Blue

XTR1
X1 H2
24VAC
X2 H1
3L2
3L1

To 3L1-2-3 (P.1/D1)
To CR4 (P.1/F3)

LS1** LS1-1 LS1-2

Sensing Line Connection

To VFD1 (AQ2) (P.4/G6)
To VFD1 (AQ1) (P.4/G6)

PT1

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

To ST1 (P.1/C1)

CR4
CR4-1 CR4-2

To CT1-2-3 (P.1/G3)

Red White Black

F2

UP DOWN

SV1-1 SV1-2

4 2

1 3

1 3

106 282

69 68 67 66 65 64

3L3 3L2 3L2 3L1 3L1

275 273	274 273	Red White Black	LS1 ⏚	UP	DOWN	⏚ AB	SV ⏚	⏚ ST	⏚ 24V IN 24V OUT	24VAC	NC C NO	NC C NO	7 5 3 1 / 8 6 4 2	⏚ ⏚	2 1	2 1	2 1
+ AI4 -	+ AI3 - / + AI2 -	+ AI1 -											IGF I3 I2 I1		L3	L2	L1
J14	J15 J16	J17	J54			J46	J43	J45	J44	J47	J36 CR4	J38 CR5	J76	J53	J4	J3	J2

I/O Electric Board

EB1

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

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

J25

IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8
		J1*	J2*		191	192 193	194

Remote Manual / Lockout / Remote Auto / Deluge Valve / Low Water Level

CR47 CR48
VFD Ready / VFD Fault

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

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

ELECTRIC FIRE PUMP CONTROLLER
VARIABLE SPEED / ACROS THE LINE
BYPASS STARTING

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

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

Expansion Board 1

To
EB1
DOWN
(P.1 / F4)

Bypass Mode — TB1

VFD Start/Stop — CR7 +A1 A2 — 105 — (P.4 / C3) — 104 / 107 — TB2

J12 — 24VDC EXT

Programmable Outputs

VFD Failure — TB3

VFD Alarm Reset (P.4/E2) — 104 / 279 — TB4

UP

VFD Constant Speed Enable (P.4/E2) — 104 / 280 — TB5

DOWN

EXB1

J9 — IN1, IN2, IN3, IN4, IN5

Programmable Inputs

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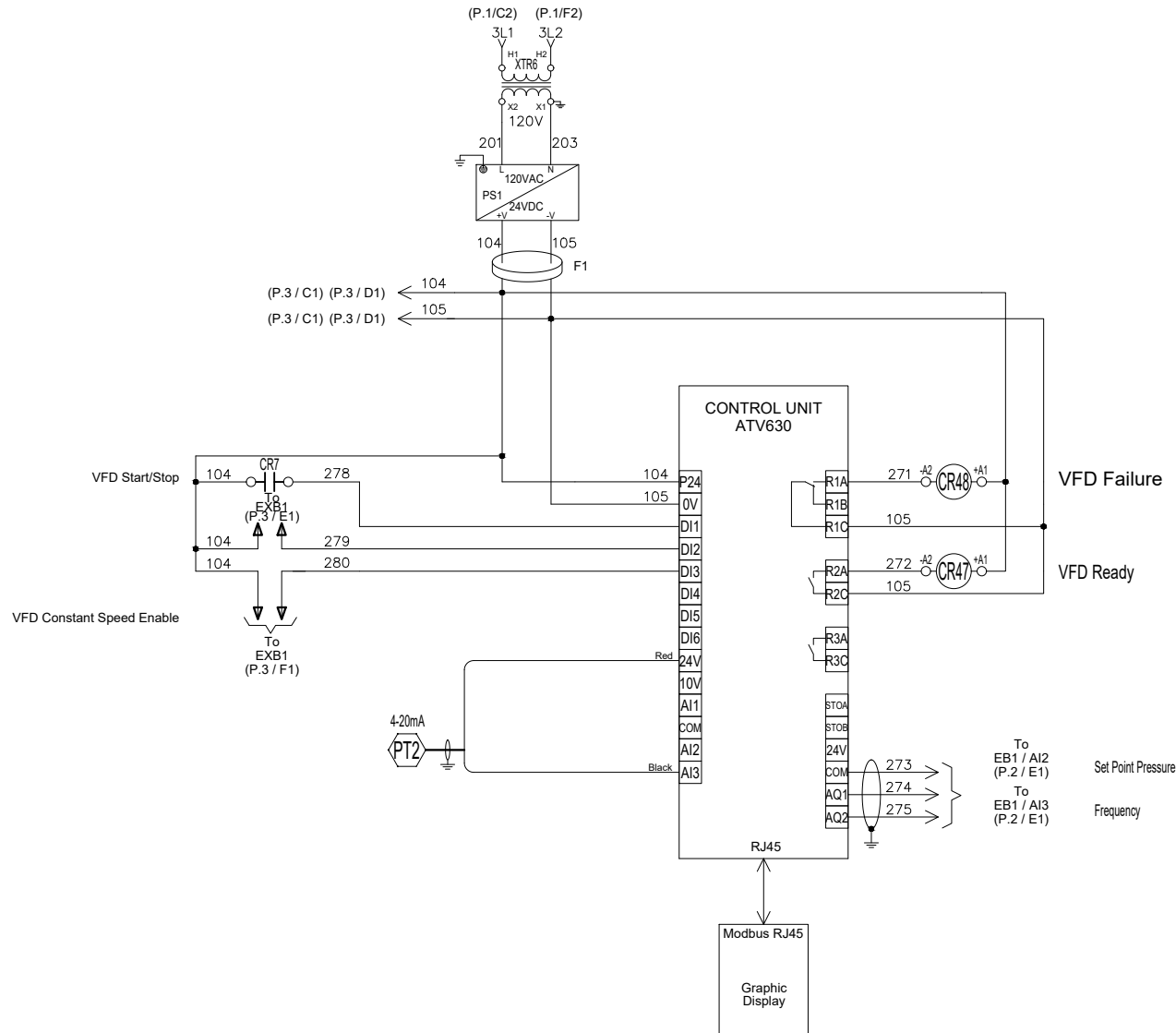|	BY	DD/MM/YY
DRAWN BY	ZS	10/07/23
FINAL APPROVAL	FC	10/07/23

**ELECTRIC FIRE PUMP CONTROLLER
VARIABLE SPEED / ACROS THE LINE
BYPASS STARTING**

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

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

(P.1/C2)   (P.1/F2)
3L1   3L2
H1   H2
XTR6
X2   X1
120V
201   203
120VAC
PS1   24VDC
+V   -V
104   105   F1

(P.3 / C1) (P.3 / D1)   104
(P.3 / C1) (P.3 / D1)   105

CONTROL UNIT
ATV630

VFD Start/Stop   104   CR7   278
T8
EXB1
(P.3 / E1)
104   279
104   280

VFD Constant Speed Enable

To
EXB1
(P.3 / F1)

4-20mA
PT2

Red
Black

104	P24
105	0V
	DI1
	DI2
	DI3
	DI4
	DI5
	DI6
	24V
	10V
	AI1
	COM
	AI2
	AI3

R1A   271   -A2   +A1   CR48   VFD Failure
R1B
R1C   105

R2A   272   -A2   +A1   CR47   VFD Ready
R2C   105

R3A
R3C

STOA
STOB
24V
COM   273   To
AQ1   274   EB1 / AI2   Set Point Pressure
AQ2   275   (P.2 / E1)
To
EB1 / AI3   Frequency
(P.2 / E1)

RJ45

Modbus RJ45

Graphic
Display

ELECTRIC FIRE PUMP CONTROLLER

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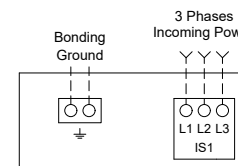BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70

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.

TORNATECH

	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

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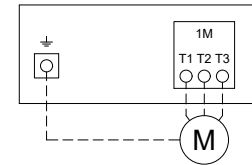VPX-TD801 /E
DWG REV. 0
SHEET 1 OF 1

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 1/0)	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 (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 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.

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

ELECTRIC FIRE PUMP CONTROLLER

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

DRAWING NUMBER
VPA-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 — IN 3 J1*
- Deluge Valve — IN 4 J2*
- Low Water Level — IN 5
- IN 6
- IN 7
- IN 8

J25

Controller Terminal Strip

Network Connections

Terminals Wire Size:
Shielded Female Connector RJ45

Located on Main Board

Modbus TCP/IP RJ45

Alarm Contacts

Terminals Wire Size:
24 - 12 AWG
0.5 Nm

I/O Electric Board

- Motor Run — TB1
- Power Available — TB2
- Normal Power Phase Reversal — TB3
- Pump Room Alarm — TB4
- Motor Trouble — TB5
- Overpressure — TB6

Normally Opened / Closes to alarm — NO, C, NC
Normally Closed / Opens to alarm — NO, C, NC

Alarm Contacts

Terminals Wire Size:
24 - 12 AWG
0.5 Nm

Expansion Board 1

- Bypass Mode — TB1
- VFD Failure — TB3

Normally Opened / Closes to alarm — NO, C, NC
Normally Closed / Opens to alarm — NO, C, NC

* Remove jumper to use this feature