



# TORNATECH

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

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

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

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

## Technical Data Submittal Document

### Model GPL

Limited Service Full Voltage  
Across the Line Start  
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.

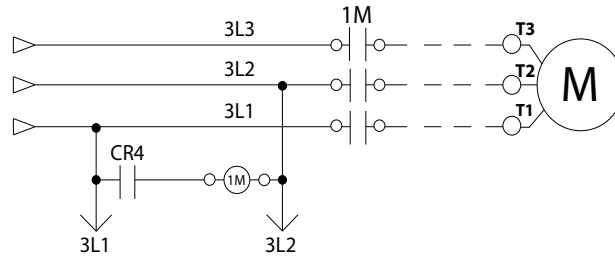


N.Y.C.  
APPROVED



October 2023

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



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

<b>Shortcircuit Withstand Rating</b>	208V to 240V- 3ph - 60Hz	380V to 480V- 3ph - 50/60Hz	600V - 3ph - 60Hz
<input type="checkbox"/> Standard	100,000A	65,000A	25,000A
<input type="checkbox"/> Optional	n/a	n/a	n/a



<b>Limitations</b>	<ul style="list-style-type: none"> <li>• Across the line starting only</li> <li>• Horsepower rating of maximum 30hp</li> <li>• Can only be installed where acceptable by the authority having jurisdiction</li> <li>• Not accepted in FM insured property</li> </ul>
<b>Ambient Temperature Rating</b>	<p><b>Standard:</b>  <input type="checkbox"/> 4°C to 40°C / 39°F to 104°F</p> <p><b>Optional:</b>  <input type="checkbox"/> 4°C to 55°C / 39°F to 131°F</p> <p>Controllers built in Dubai, UAE (Tornatech FZE) are supplied standard with 55°C rating.</p>
<b>Surge Suppression</b>	Surge arrestor rated to suppress surges above line voltage
<b>Disconnecting Means</b>	<ul style="list-style-type: none"> <li>• Door interlocked in the ON position</li> <li>• Circuit breaker continuous rating not less than 115% of motor full load current</li> <li>• Overcurrent sensing non-thermal type, magnetic only</li> <li>• Instantaneous trip setting of not more than 20 times the motor full load current</li> <li>• Common flange mounted operating handle</li> </ul>
<b>Service Entrance Rating</b>	Suitable as service entrance equipment
<b>Emergency Start Handle</b>	<ul style="list-style-type: none"> <li>• Flange mounted</li> <li>• Pull and latch activation</li> <li>• Integrated limit switch</li> <li>• Across the line start (direct on line)</li> </ul>
<b>Locked Rotor Protector</b>	<ul style="list-style-type: none"> <li>• Operate shunt trip to open circuit breaker</li> <li>• Factory set at 600% of motor full load current</li> <li>• Trip between 8 and 20 seconds</li> </ul>
<b>Electrical Readings</b>	<ul style="list-style-type: none"> <li>• Voltage phase to phase (normal power)</li> <li>• Amperage of each phase when motor is running</li> </ul>
<b>Pressure Readings</b>	<ul style="list-style-type: none"> <li>• Continuous system pressure display</li> <li>• Cut-in and Cut-out pressure settings</li> </ul>
<b>Pressure and Event recorder</b>	<ul style="list-style-type: none"> <li>• Pressure readings with date stamp</li> <li>• Event recording with date stamp</li> <li>• Under regular maintained operation, events are stored in memory for the life of the controller.</li> <li>• Data viewable on operator interface display screen</li> <li>• Downloadable by USB port to external memory device</li> </ul>
<b>Pressure Sensing</b>	<ul style="list-style-type: none"> <li>• Pressure transducer and run test solenoid valve assembly for fresh water application</li> <li>• Pressure sensing line connection 1/2" Female NPT</li> <li>• Drain connection 3/8"</li> <li>• Rated for 0-500PSI working pressure (standard display at 0-300PSI)</li> <li>• Externally mounted with protective cover</li> </ul>



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

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



<b>ViZiTouch V2.1 Operator Interface</b>	<ul style="list-style-type: none"> <li>• Embedded microcomputer with software PLC logic</li> <li>• 7.0" color touch screen (HMI technology)</li> <li>• Upgradable software</li> <li>• Multi-language</li> </ul>		
<b>Communication Protocol Capability</b>	<ul style="list-style-type: none"> <li>• Protocol: Modbus</li> <li>• Connection type: Shielded female connector RJ45</li> <li>• Frame Format: TCP/IP</li> <li>• Addresses: See bulletin MOD-GPx</li> </ul>		
<b>Operation</b>	<b>Automatic Start</b>	<ul style="list-style-type: none"> <li>• Start on pressure drop</li> <li>• Remote start signal from automatic device</li> <li>• Deluge valve start</li> </ul>	
	<b>Manual Start</b>	<ul style="list-style-type: none"> <li>• Start pushbutton</li> <li>• Run test pushbutton</li> <li>• Remote start from manual device</li> </ul>	
	<b>Stopping</b>	<ul style="list-style-type: none"> <li>• Manual with Stop pushbutton</li> <li>• Automatic after expiration of minimum run timer ***</li> </ul>	
	<b>Timers</b>	Field Adjustable & Visual Countdown	<ul style="list-style-type: none"> <li>• Minimum run timer ***(off delay)</li> <li>• Sequential start timer (on delay)</li> <li>• Periodic test timer</li> </ul>
	<b>Actuation</b>	Visual Indication	<ul style="list-style-type: none"> <li>• Pressure</li> <li>• Non-pressure</li> </ul>
	<b>Mode</b>		<ul style="list-style-type: none"> <li>• Automatic</li> <li>• Non-automatic</li> </ul>

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



<input type="checkbox"/>	A4	Flow switch provision
<input type="checkbox"/>	A8	Foam pump application w/o pressure transducer and run test solenoid valve.
<input type="checkbox"/>	A9	Low zone pump control function
<input type="checkbox"/>	A10	Middle zone pump control function
<input type="checkbox"/>	A11	High zone pump control function
<input type="checkbox"/>	A13	Non-pressure actuated controller w/o pressure transducer and run test solenoid valve
<input type="checkbox"/>	A16	Lockout/interlock circuit from equipment installed inside the pump room
<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"/>	B21	Ground fault alarm detection c/w visual indication and alarm contact (DPDT)
<input type="checkbox"/>	C1	Extra motor run alarm contact (DPDT)
<input type="checkbox"/>	C4	Periodic test alarm contact (DPDT)
<input type="checkbox"/>	C6	Low discharge pressure 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"/>	C11	High electric motor temperature alarm contact (DPDT)
<input type="checkbox"/>	C12	High electric motor vibration c/w visual indication and 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"/>	C16	Control voltage healthy alarm contact (DPDT)
<input type="checkbox"/>	C17	Flow meter valve loop open c/w visual indication and alarm contact (DPDT)
<input type="checkbox"/>	C18	High water reservoir level c/w visual indication and alarm contact (DPDT)

<input type="checkbox"/>	C19	Emergency start alarm contact (DPDT)
<input type="checkbox"/>	C20	Manual 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"/>	C25	Second set of standard alarm contacts (DPDT) (Typical for city of Los Angeles and Denver)
<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"/>	D13A	High withstand rating for • 380V to 480V = 65kA* • 600V = 25kA*
<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"/>	D18	CE Mark with factory certificate
<input type="checkbox"/>	D26	Modbus with RTU frame format and RS485 connection
<input type="checkbox"/>	D27	Motor heater connection (external single phase power source and heater on/off contact)
<input type="checkbox"/>	D27A	Motor heater connection (internal single phase power source and heater on/off contact)
<input type="checkbox"/>	D28	Customized drawing set
<input type="checkbox"/>	D34A	Field programmable I/O board - 5 Input / 5 output
<input type="checkbox"/>	D36	Redundant pressure transducer for fresh water rated for 0-500PSI
<input type="checkbox"/>	D36A	Redundant pressure transducer for sea water rated for 0-500PSI

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



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<input type="checkbox"/>	L02	French
<input type="checkbox"/>	L03	Spanish
<input type="checkbox"/>	L04	German
<input type="checkbox"/>	L05	Italian
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<input type="checkbox"/>	L15	Turkish
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<input type="checkbox"/>	L19	Indonesian
<input type="checkbox"/>	L20	Slovenian
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<input type="checkbox"/>	L22	Greek
<input type="checkbox"/>	L23	Arabic
<input type="checkbox"/>	L24	Hebrew
<input type="checkbox"/>	L25	Chinese

Additional Options:

\_\_\_\_\_

\_\_\_\_\_

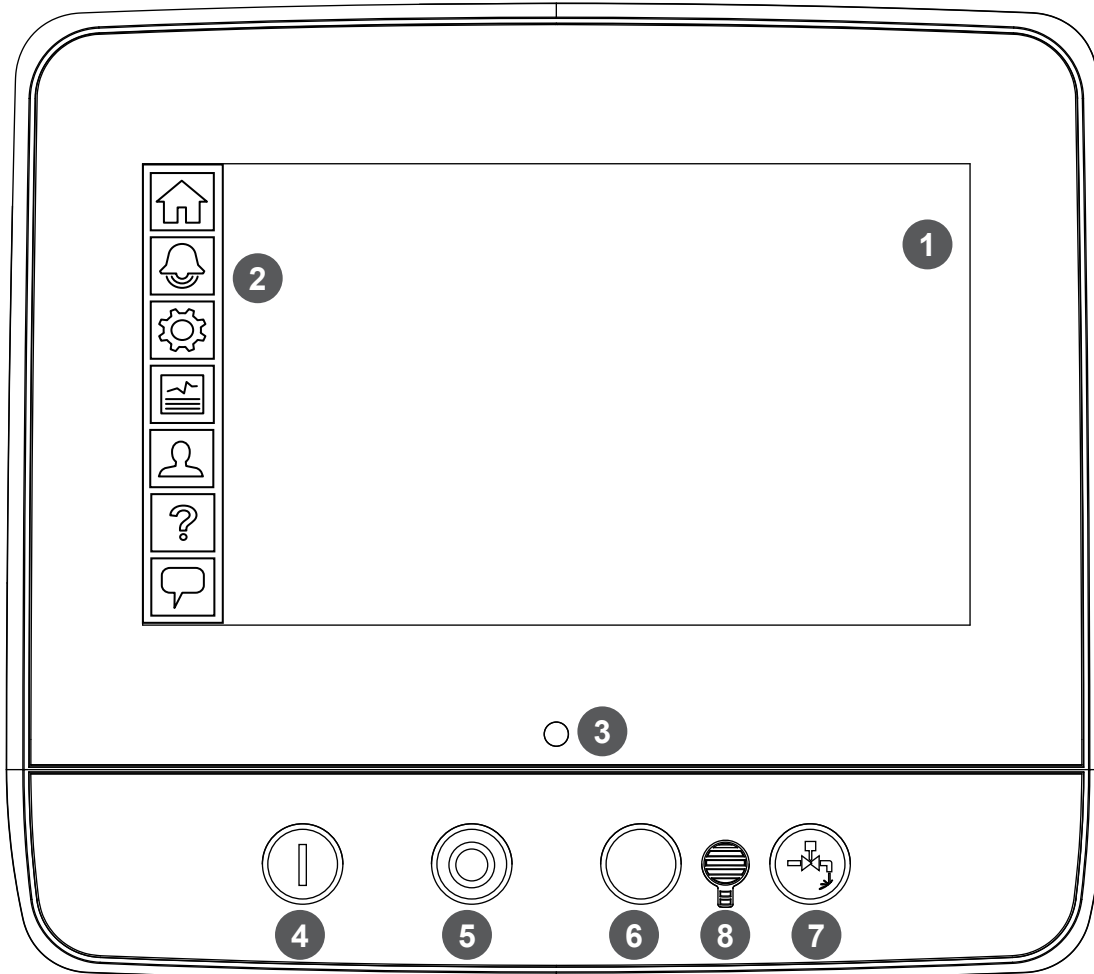
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Note: Options chosen from this page are not electrically represented on the wiring schematics in this submittal package.

**ViZiTouch V2.1 Operator Interface**



- |                        |                          |
|------------------------|--------------------------|
| 1 - Color touch screen | 3 - Power LED (3 colors) |
| 2 - Onscreen menu      | 4 - START button         |
| • HOME page            | 5 - STOP button          |
| • ALARM page           | 6 - Not Used             |
| • CONFIGURATION page   | 7 - RUN TEST button      |
| • HISTORY page         | 8 - Alarm buzzer         |
| • SERVICE page         |                          |
| • MANUAL page          |                          |
| • LANGUAGES page       |                          |





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

# LIMITED SERVICE PUMP CONTROLLER

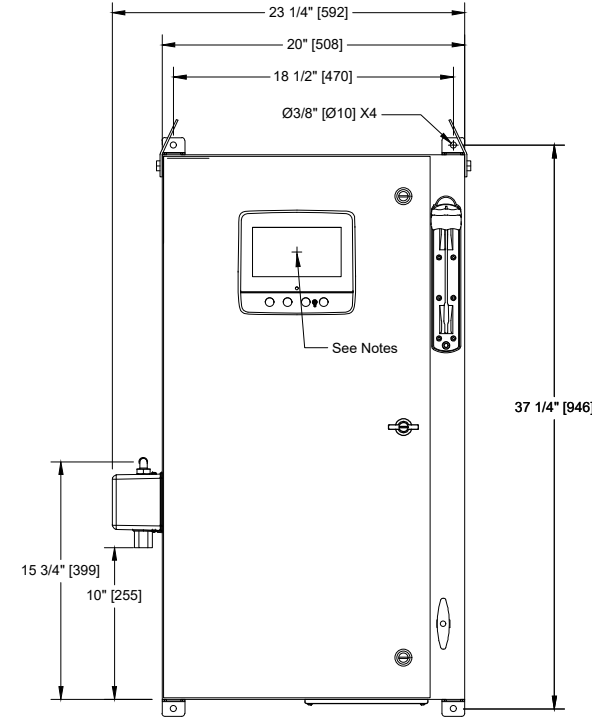
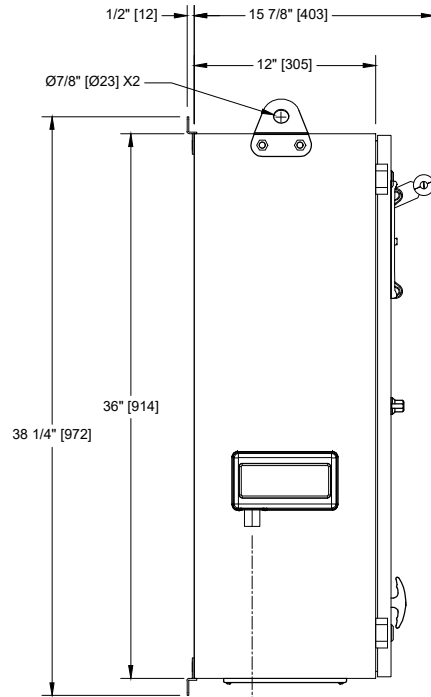
**MODEL: GPL**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70



THIRD ANGLE  
PROJECTION

DRAWING NUMBER  
**GPL-D1800/E**  
DWG REV. 0  
SHEET 1 OF 1

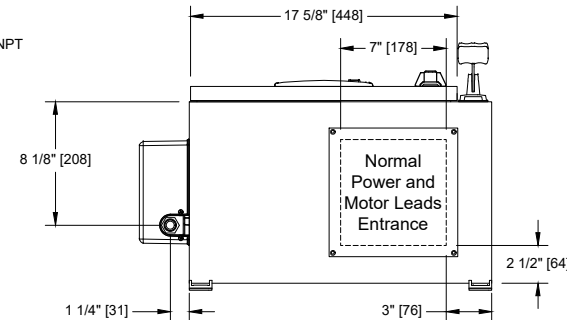


Voltage / Power Table		
Voltage	Min HP	Max HP
<b>1 Phase</b>		
110 - 120	1	7.5
208	3	15
220 - 240	3	15
<b>3 Phases</b>		
208	3	30
220 - 240	3	30
380 - 400 - 415	3	30
440 - 480	3	30
600	3	30

Sensing Line Connection - 1/2" F.NPT

**Notes:**

- Standard NEMA: NEMA 2
- 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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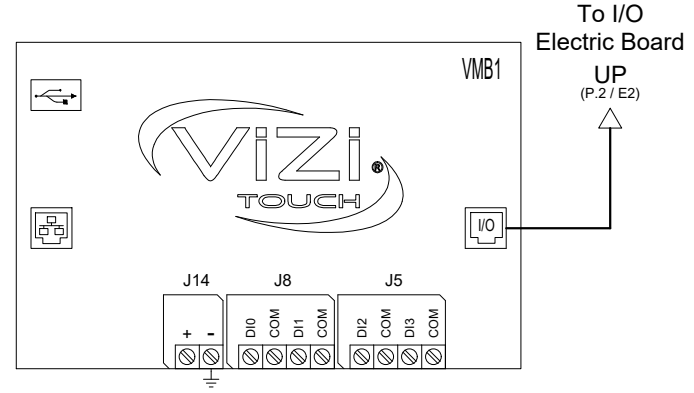
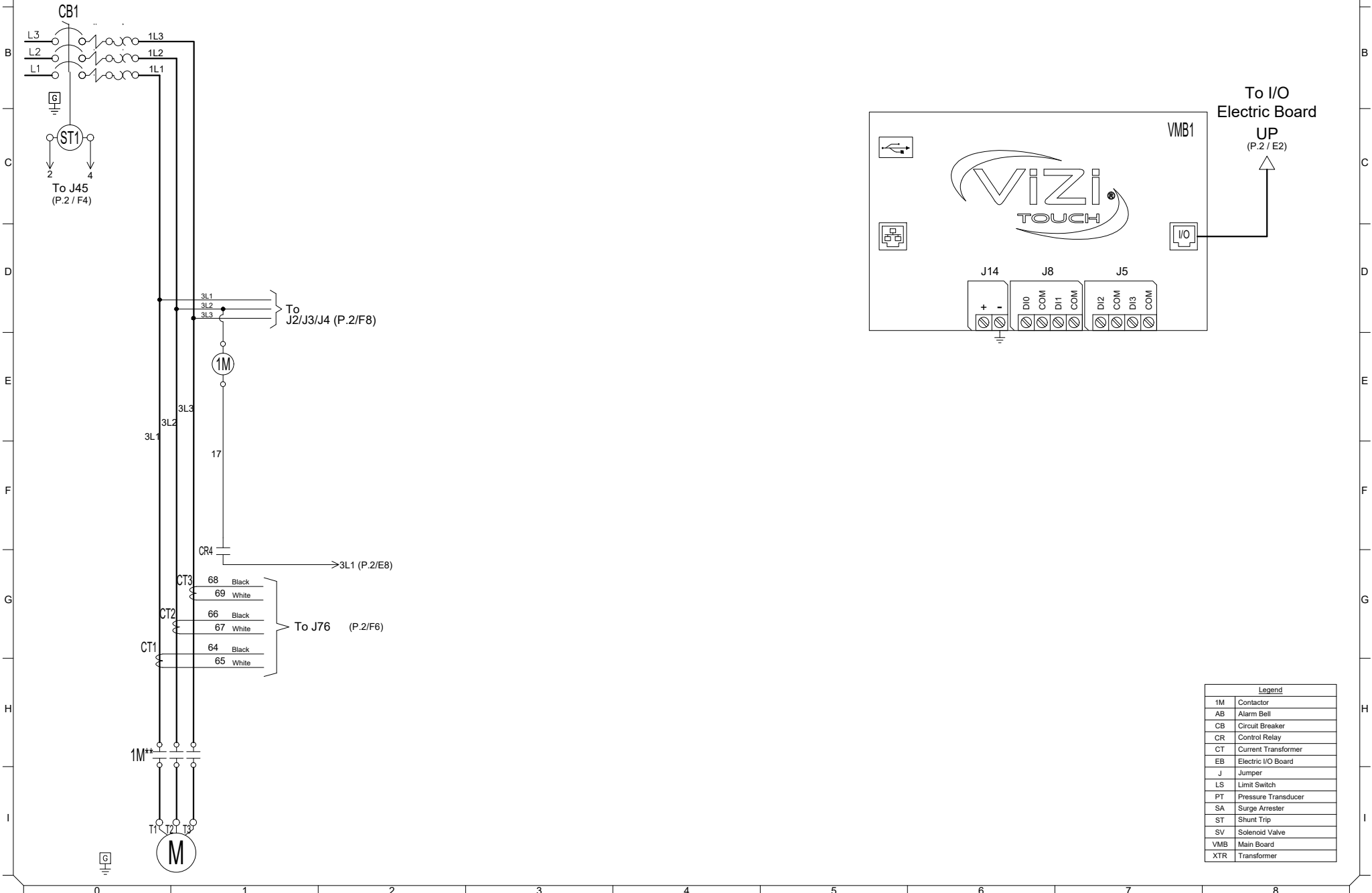
# LIMITED SERVICE PUMP CONTROLLER ACROSS THE LINE / 3 PHASES

**MODEL: GPL**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70



DRAWING NUMBER	GPL-WS801/E
DWG REV. 0	
SHEET 1 OF 2	



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



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FINAL APPROVAL	FC	28/02/23	

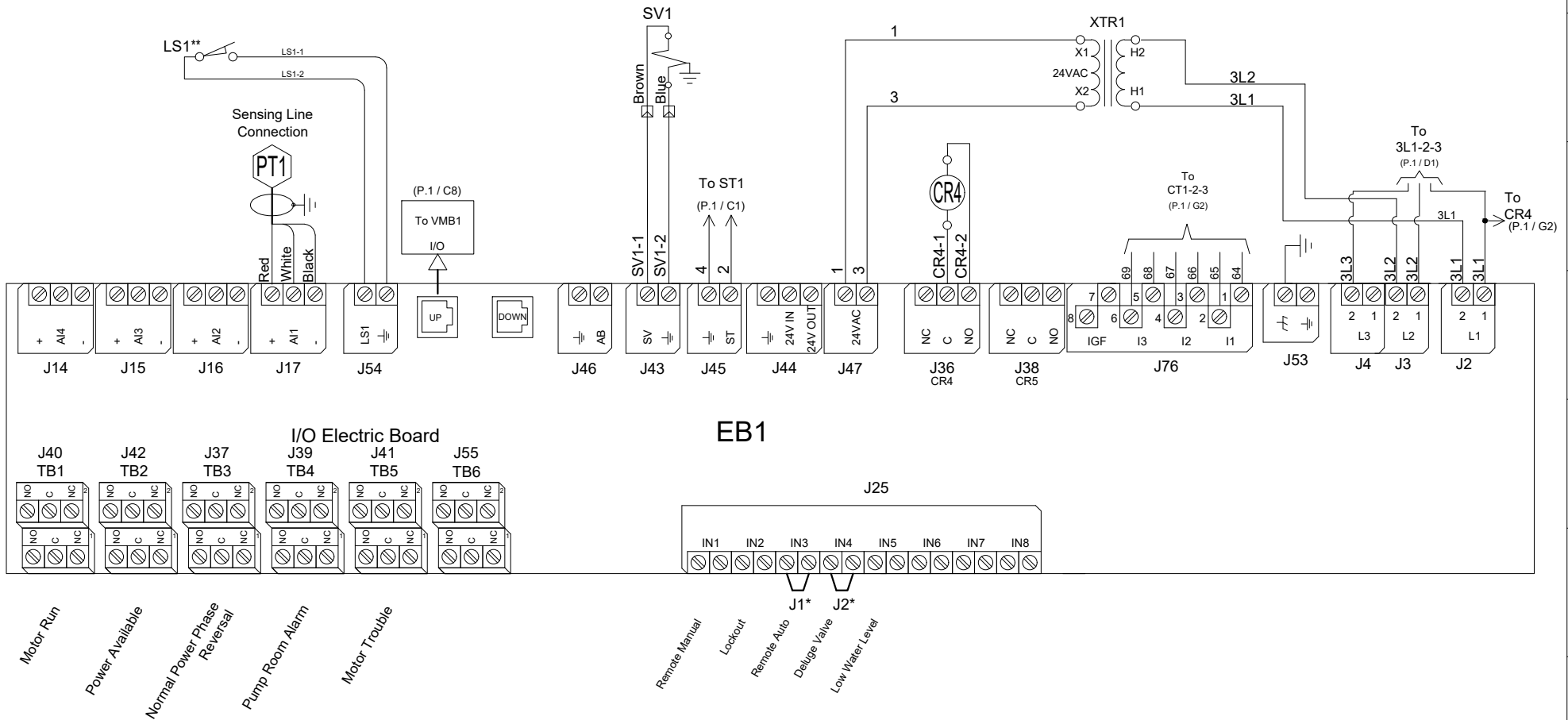
# LIMITED SERVICE PUMP CONTROLLER ACROSS THE LINE / 3 PHASES

**MODEL: GPL**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70



DRAWING NUMBER	GPL-WS801/E
DWG REV. 0	
SHEET 2 OF 2	



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



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## LIMITED SERVICE PUMP CONTROLLER

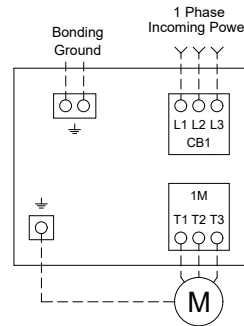
**MODEL: GPL**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70



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

### Power Terminals Model : GPL 3 Phases



**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.
- 5 - Field wiring and lug sizes are based on copper conductors only. Do not use aluminum conductors.

#### Circuit Breaker (CB) Field Wiring according to Bending Space (AWG or MCM). TERMINALS L1 - L2 - L3

Bending Space	3 " (76 mm)						
HP Voltage	5	7.5	10	15	20	25	30
208	1x (10 to 1)	1x (8 to 1)	1x (8 to 1)	1x (6 to 1)	1x (4 to 1)	1x (3 to 1)	1x (2 to 1)
220 to 240	1x (10 to 1)	1x (10 to 1)	1x (8 to 1)	1x (6 to 1)	1x (4 to 1)	1x (4 to 1)	1x (3 to 1)
380 to 416	1x (10 to 1)	1x (10 to 1)	1x (10 to 1)	1x (8 to 1)	1x (8 to 1)	1x (6 to 1)	1x (6 to 1)
440 to 480	1x (10 to 1)	1x (10 to 1)	1x (10 to 1)	1x (10 to 1)	1x (8 to 1)	1x (8 to 1)	1x (6 to 1)
600	1x (10 to 1)	1x (10 to 1)	1x (10 to 1)	1x (10 to 1)	1x (10 to 1)	1x (8 to 1)	1x (8 to 1)

(Use Copper Conductors Only)

#### Wiring Size for motor connection for Model GPL (AWG or MCM). TERMINALS T1 - T2 - T3

HP Voltage	5	7.5	10	15	20	25	30
208	1x (10)	1x (10)	1x (8 to 2)	1x (6 to 2)	1x (4 to 1)	1x (3 to 1)	1x (2 to 1)
220 to 240	1x (12 to 2)	1x (10 to 2)	1x (8 to 2)	1x (6 to 2)	1x (4 to 1)	1x (4 to 1)	1x (3 to 1)
380 to 416	1x (14 to 10)	1x (12 to 10)	1x (8 to 2)	1x (8 to 2)	1x (8 to 2)	1x (6 to 2)	1x (6 to 2)
440 to 480	1x (14 to 10)	1x (14 to 10)	1x (12 to 10)	1x (10)	1x (8 to 2)	1x (8 to 2)	1x (6 to 2)
600	1x (14 to 10)	1x (14 to 10)	1x (14 to 10)	1x (12 to 10)	1x (10)	1x (8 to 2)	1x (8 to 2)

(Use Copper Conductors Only)

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



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

# LIMITED SERVICE PUMP CONTROLLER

**MODEL: GPL**

BUILT TO THE LATEST EDITION OF THE NFPA20 & NFPA70



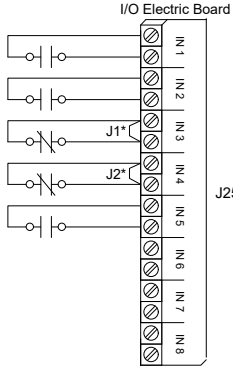
DRAWING NUMBER	GPX-TD802/E
DWG REV. 0	
SHEET 1 OF 1	

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## Field Connections

Terminals Wire Size:  
24 - 12 AWG  
0.5 Nm

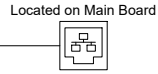
- Remote Manual
- Lockout
- Remote Auto
- Deluge Valve
- Low Water Level



## Network Connections

Terminals Wire Size:  
Shielded Female Connector RJ45

Modbus TCP/IP RJ45



## Alarm Contacts

Terminals Wire Size:  
24 - 12 AWG  
0.5 Nm

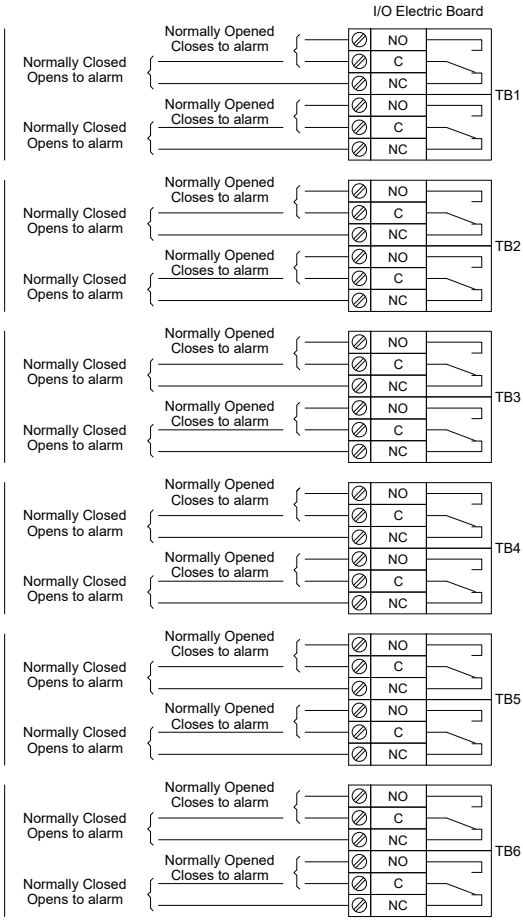
Controller Terminal Strip

Normal Power Phase Reversal

Pump Room Alarm\*\*

Motor Trouble\*\*

(Field Programmable)



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