



TORNATECH

Project: _____

Customer: _____

Engineer: _____

Pump Manufacturer: _____

Technical Data Submittal Document

Model GPL+GLU

Limited Service Full Service

Across the Line Start

Electric Fire Pump Controller
with Automatic Power Transfer Switch



Contents:

Data Sheets

Dimensional Data

Wiring Schematics

Field Connections

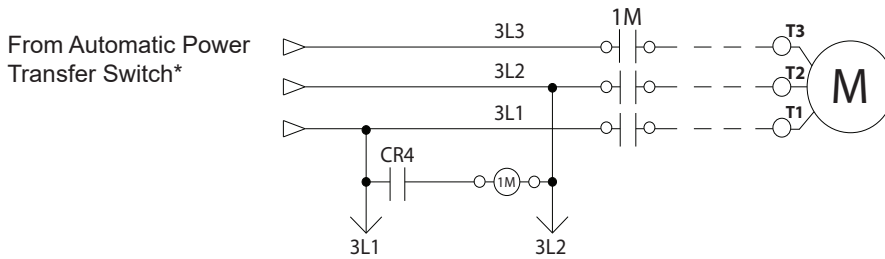
Note: The drawings included in this package are for controllers covered under our standard offering. Actual AS BUILT drawings may differ from what is shown in this package.



N.Y.C.
APPROVED



August 2020



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OPTIONAL

Standard, Listings, Approvals 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
Enclosure	Protection Rating	
	<input type="checkbox"/> Standard: NEMA 2 Optional <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	
	Accessories <ul style="list-style-type: none"> • Bottom entry gland plate • Lifting Lugs • Keylock handle 	Paint Specifications <ul style="list-style-type: none"> • Red RAL3002 • Powder coating • Glossy textured finish

Shortcircuit Withstand Rating	208V to 240V- 3ph - 50/60Hz		380V to 480V- 3ph - 60Hz		600V - 3ph - 60Hz	
	Normal Power	Alternate Power	Normal Power	Alternate Power	Normal Power	Alternate Power
Standard	65,000A		25,000A		18,000A	
Optional	n/a		65,000A		25,000A	

*Please see Disconnecting Means details on page 3



Limitations	<ul style="list-style-type: none"> • Across the line starting only • Horsepower rating of maximum 30hp • Can only be installed where acceptable by the authority having jurisdiction • Not accepted in FM insured property
Ambient Temperature Rating	<p>Standard: <input type="checkbox"/> 4°C to 40°C / 39°F to 104°F</p> <p>Optional: <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>
Surge Suppression	Surge arrestor rated to suppress surges above line voltage
Disconnecting Means	<ul style="list-style-type: none"> • Door interlocked in the ON position • 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 • 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	4" 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 only</p> <ul style="list-style-type: none"> • Alternate lock rotor current • Alternate power phase reversal • Automatic transfer switch trouble • Control voltage not healthy • Invalid cut-in • Lock rotor current • Loss of power • Low ambient temperature <p>Visual and Audible</p> <ul style="list-style-type: none"> • ACB in OFF or tripped • Alternate IS tripped/open • Fail to start <ul style="list-style-type: none"> • Low water level • Motor trouble • Normal power phase reversal • Overcurrent • Overvoltage • Phase loss L1 • Phase loss L2 • Phase loss L3 • Phase unbalanced <ul style="list-style-type: none"> • Pressure transducer fault detected • 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



Automatic Power Transfer Switch	Surge Suppression	Surge arrestor rated to suppress surges above line voltage
	Disconnecting Means	<ul style="list-style-type: none"> - Door interlocked in the ON position - 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
	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
	Visual Indications	<ul style="list-style-type: none"> • Alternate (emergency) isolating switch in the OFF position • Alternate (emergency) voltage phase to phase • Transfer switch in normal position • Transition timers
	Visual Alarms	<ul style="list-style-type: none"> • Transfer switch trouble • Alternate power phase reversal • Alternate isolating switch open/tripped • Alternate circuit breaker open/tripped • Alternate side locked rotor current
	Transfer switch test pushbutton	
	Bypass for re-transfer and generator shutdown	
	Electrically operated and mechanically held in the normal or alternate position	
	Provision for manual operation	
	Remote Alarm Contacts SPDT-8A-250VAC <ul style="list-style-type: none"> • Isolating switch in the OFF position • Transfer switch in normal position • Transfer switch in alternate (emergency) position 	
	Time Delays <ul style="list-style-type: none"> • Momentary normal power outage override (factory set at 3 sec - field adjustable 1 to 3 sec) • Alternate (emergency) power available delay (factory set at 3 sec - field adjustable 1 to 3 sec) • Transfer trouble delay (factory set at 20 sec - field adjustable 1 to 60 sec) • Retransfer to normal (factory set at 5 min - field adjustable 1 to 20 min) • Generator cooldown (factory set at 5 min - field adjustable 1 to 20 min) 	
	Voltage Sensing <ul style="list-style-type: none"> • Transfer to alternate (normal power dropout) 85% of nominal - field adjustable 0 to 100% • Phase reversal transfer to alternate • Retransfer to normal (normal power pickup) 90% of nominal - field adjustable 0 to 100% 	
	Audible Alarm (AIS Open) 4" alarm bell - 85 dB at 10ft. (3m)	
	Generator Start Connection SPDT-8A-250V.AC	



Model GPL+GLU Electric Fire Pump Controller with Automatic Power Transfer Switch

<input type="checkbox"/> A4	Flow switch provision	<input type="checkbox"/> C18	High water reservoir level c/w visual indication and alarm contact (DPDT)
<input type="checkbox"/> A8	Foam pump application w/o pressure transducer and run test solenoid valve.	<input type="checkbox"/> C19	Emergency start alarm contact (DPDT)
<input type="checkbox"/> A9	Low zone pump control function	<input type="checkbox"/> C20	Manual start alarm contact (DPDT)
<input type="checkbox"/> A10	Middle zone pump control function	<input type="checkbox"/> C21	Deluge valve start alarm contact (DPDT)
<input type="checkbox"/> A11	High zone pump control function	<input type="checkbox"/> C22	Remote automatic start alarm contact (DPDT)
<input type="checkbox"/> A13	Non-pressure actuated controller w/o pressure transducer and run test solenoid valve	<input type="checkbox"/> C23	Remote manual start alarm contact (DPDT)
<input type="checkbox"/> A16	Lockout/interlock circuit from equipment installed inside the pump room	<input type="checkbox"/> C24	High pump room temperature alarm contact (DPDT)
<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"/> C25	Second set of standard alarm contacts (DPDT) (Typical for city of Los Angeles and Denver)
<input type="checkbox"/> B11B	Built in alarm panel same as B11 but 220-240VAC supervisory power	<input type="checkbox"/> Cx	Additional visual and alarm contact (Specify function) (DPDT)
<input type="checkbox"/> B19A	High motor temperature c/w thermostat relay and alarm contacts (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"/> B19B	High motor temperature c/w PT100 relay and alarm contacts (DPDT)	<input type="checkbox"/> D1A	Low suction pressure transducer for sea water rated at 0-300PSI with visual indication and alarm contact
<input type="checkbox"/> B21	Ground fault alarm detection c/w visual indication and alarm contact (DPDT)	<input type="checkbox"/> D13A	High withstand rating for (normal power section) • 380v to 480v=65ka • 600v = 25ka
<input type="checkbox"/> C1	Extra motor run alarm contact (DPDT)	<input type="checkbox"/> D14	Anti-condensation heater & thermostat
<input type="checkbox"/> C4	Periodic test alarm contact (DPDT)	<input type="checkbox"/> D14A	Anti-condensation heater & humidistat
<input type="checkbox"/> C6	Low discharge pressure alarm contact (DPDT)	<input type="checkbox"/> D14B	Anti-condensation heater & thermostat & humidistat
<input type="checkbox"/> C7	Low pump room temperature alarm contact (DPDT)	<input type="checkbox"/> D15	Tropicalization
<input type="checkbox"/> C10	Low water reservoir level alarm contact (DPDT)	<input type="checkbox"/> D18	CE Mark with factory certificate
<input type="checkbox"/> C11	High electric motor temperature alarm contact (DPDT)	<input type="checkbox"/> D26	Modbus with RTU frame format and RS485 connection
<input type="checkbox"/> C12	High electric motor vibration c/w visual indication and alarm contact (DPDT)	<input type="checkbox"/> D27	Motor heater connection (external single phase power source and heater on/off contact)
<input type="checkbox"/> C14	Pump on demand / automatic start alarm contact (DPDT)	<input type="checkbox"/> D27A	Motor heater connection (internal single phase power source and heater on/off contact)
<input type="checkbox"/> C15	Pump fail to start alarm contact (DPDT)	<input type="checkbox"/> D28	Customized drawing set
<input type="checkbox"/> C16	Control voltage healthy alarm contact (DPDT)	<input type="checkbox"/> D34A	Field programmable I/O board - 5 Input / 5 output
<input type="checkbox"/> C17	Flow meter valve loop open c/w visual indication and alarm contact (DPDT)	<input type="checkbox"/> D36	Redundant pressure transducer for fresh 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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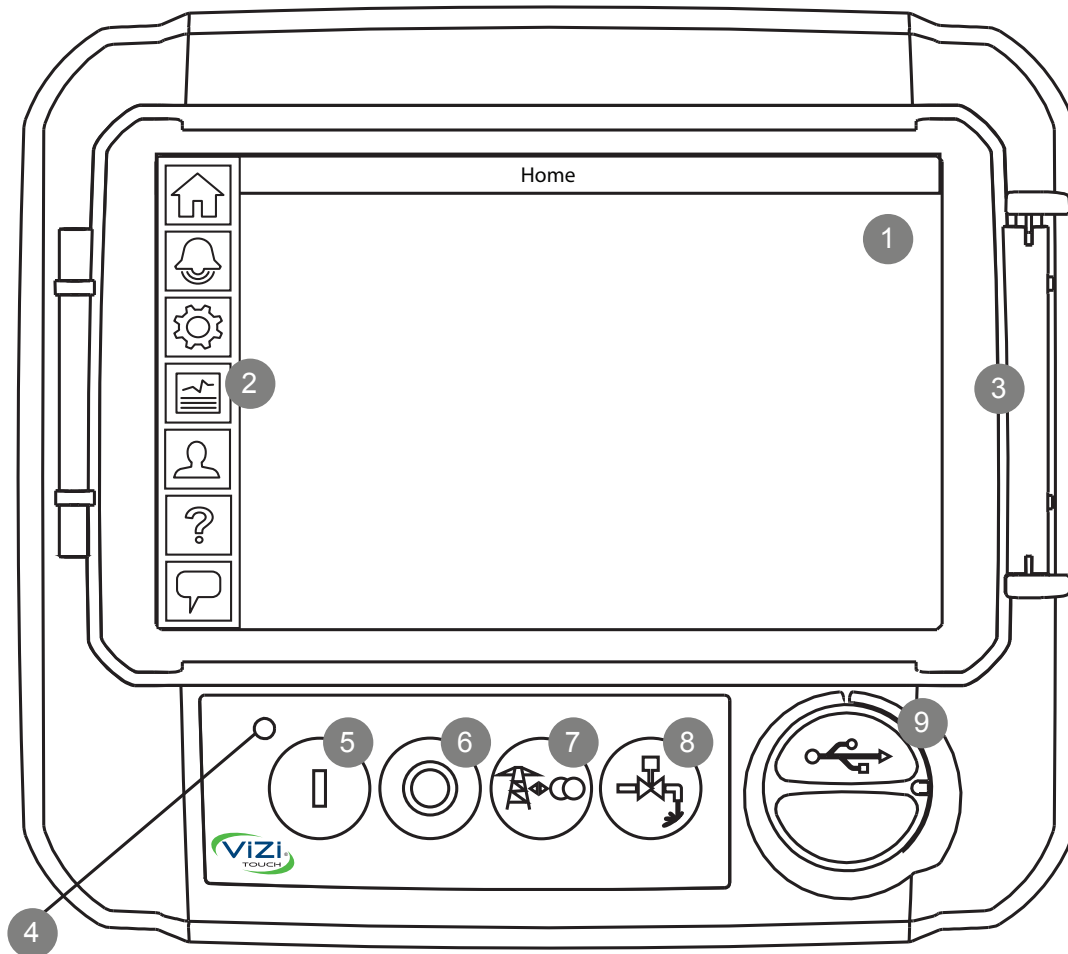
Model GPL+GLU Electric Fire Pump Controller with Automatic Power Transfer Switch

<input type="checkbox"/> D36A	Redundant pressure transducer for sea water rated for 0-500PSI
<input type="checkbox"/> E1	Permanent load shedding contacts
<input type="checkbox"/> E2	Temporary pump motor start period load shedding contacts
<input type="checkbox"/> E3	Temporary & permanent load shedding contacts
<input type="checkbox"/> F2	Anti condensation heater & thermostat (alternate power section)
<input type="checkbox"/> F2A	Anti condensation heater & humidistat (alternate power section)
<input type="checkbox"/> F2B	Anti condensation heater & thermostat & humidistat (alternate power section)
<input type="checkbox"/> F6A	High withstand rating for (model GLU only) : 380v to 480v=65ka • 600v=25ka

<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.

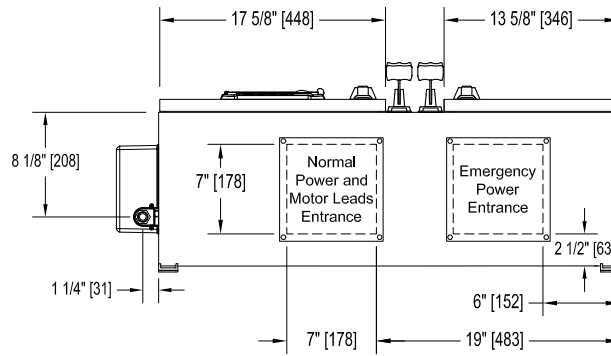
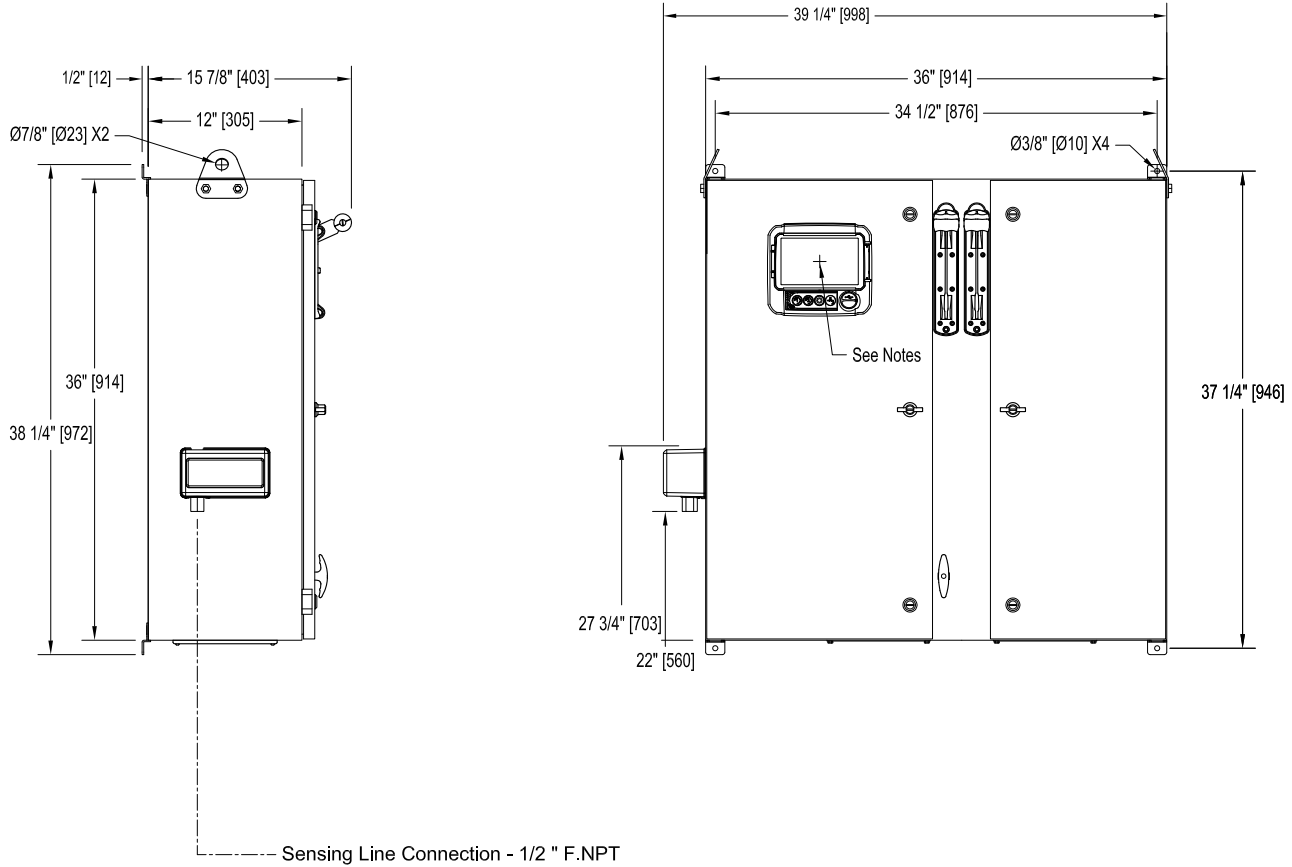
ViZiTouch V2 Operator Interface


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

Electric Fire Pump Controller With Automatic Transfer Switch Dimensions

Model: GPL+GLU

Built to the latest edition of the NFPA 20 standard

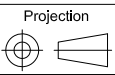


VOLT/Hz	HP RATING	
	MIN HP	MAX HP
1 PHASE		
110-120 / 60	1 HP	7.5 HP
200-208 / 50-60	3 HP	15 HP
230-240 / 50-60	3 HP	15 HP
3 PHASES		
200-208 / 50-60	3 HP	30 HP
230-240 / 50-60	3 HP	30 HP
380-415 / 50-60	3 HP	30 HP
440-480 / 50-60	3 HP	30 HP
575-600 / 60	3 HP	30 HP

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.

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



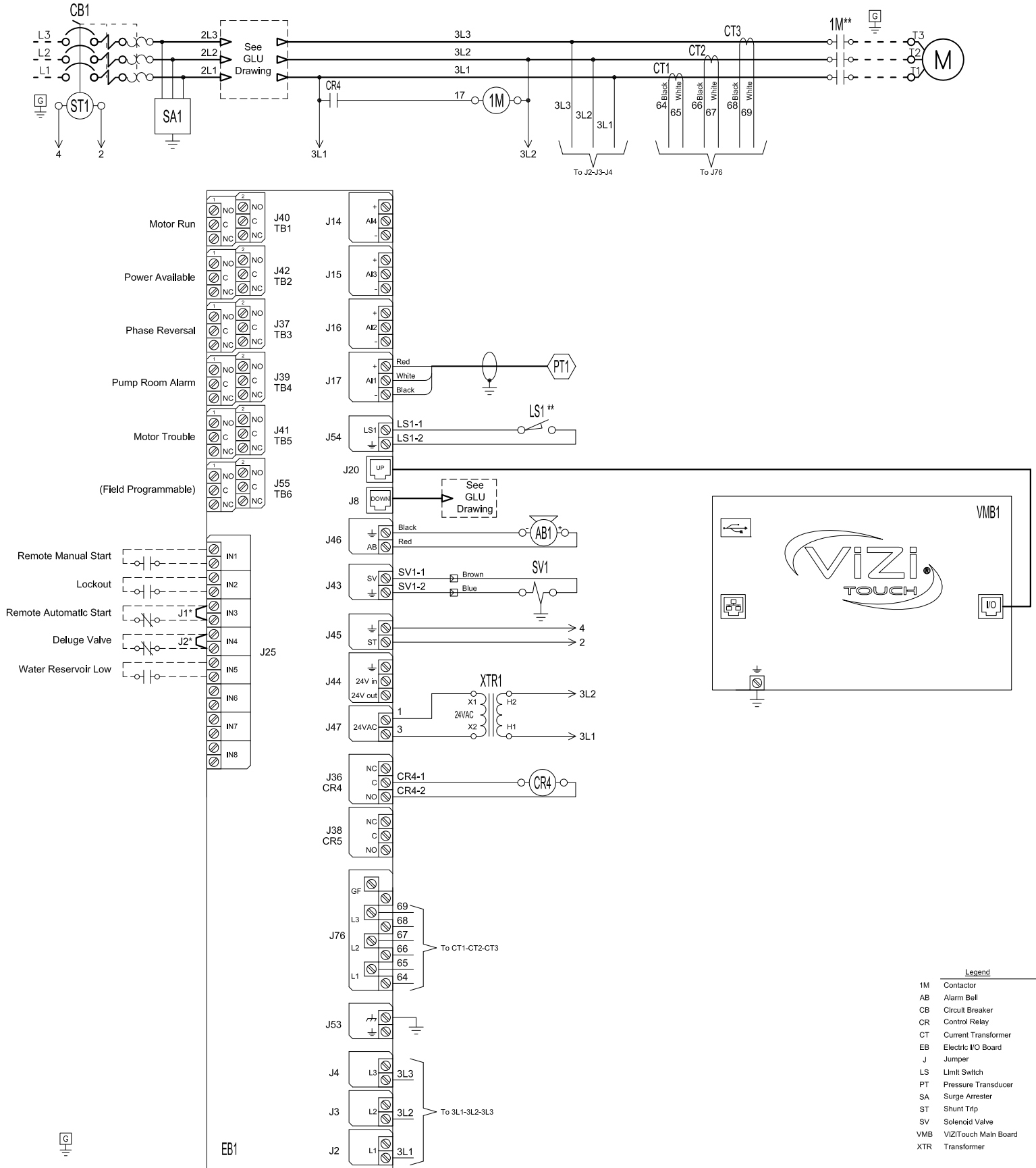
REV.	DESCRIPTION	DD/MM/YY	Drawing number
0	First issue	31/10/19	GPL-DI701 /E

Limited Service Pump Controller Across the Line / 3 Phase With Automatic Transfer Switch

Wiring schematic

Model: GPL+GLU

Built to the latest edition of the NFPA 20 standard

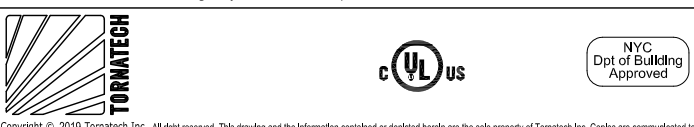


* Remove jumper to use this feature
** Contact closes when emergency start is in "ON" position

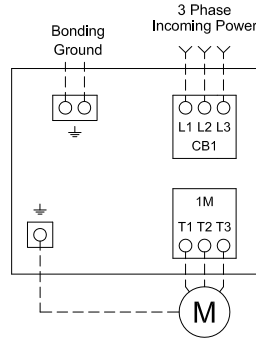
Drawing for Information only.
Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.

Legend	
1M	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	VIZITouch Main Board
XTR	Transformer

REV.	DESCRIPTION	DD/MM/YY	Drawing number
0	First issue	31/10/19	GPL-WS711 /E



Power Terminals Model : GPL 3 Phase



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 aluminium conductors.

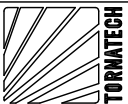
Circuit Breaker (CB) Field Wiring according to Bending Space (AWG or MCM). TERMINALS L1 - L2 - L3

Bending Space	3 " (76 mm) (Use Copper Conductors Only)						
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)

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 10)	1x (10)	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 1)
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)

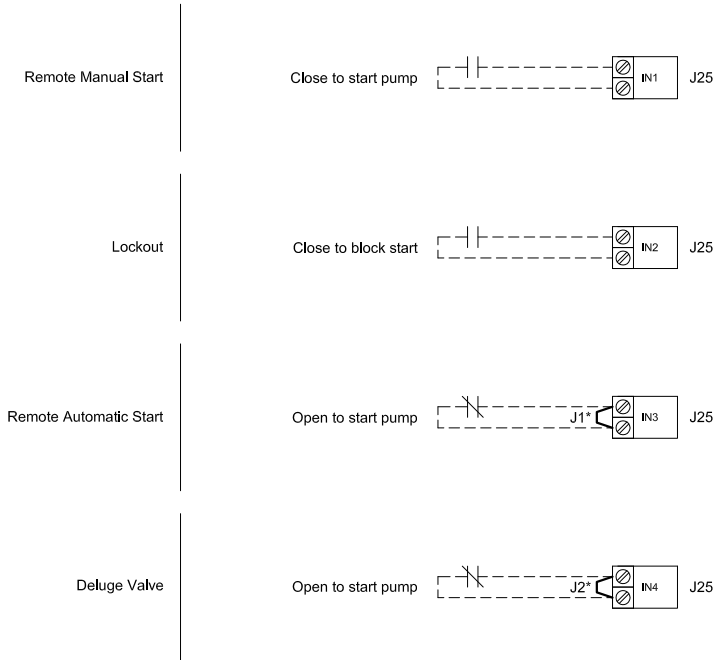
Drawing for Information only.
Manufacturer reserves the right to modify this drawing without notice.
Contact manufacturer for "As Built" drawing.



REV.	DESCRIPTION	DD/MM/YY	Drawing number
0	First issue	31/10/19	GPL-TD701 1/2 /E

Control Terminals (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



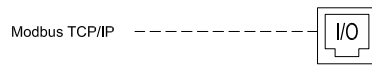
Alarm Inputs (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



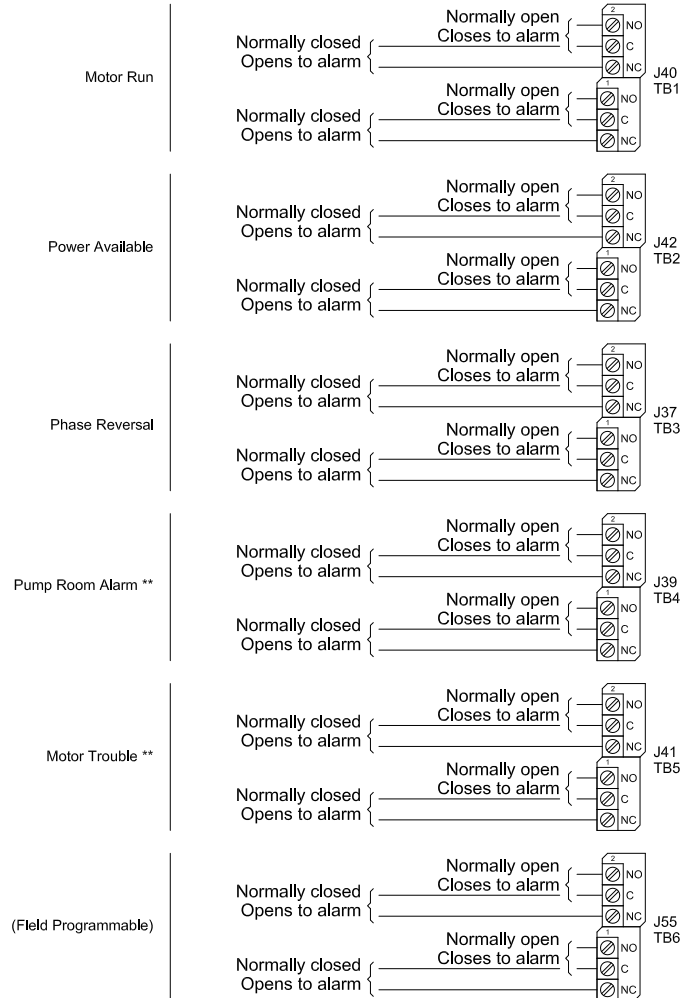
Network Connection (VMB1)

Shielded Female Connector RJ45



Remote Alarm Terminals (EB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



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

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	31/10/19	GPL-TD701 2/2 /E

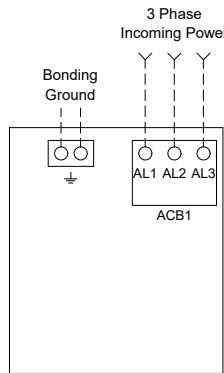
Automatic Power Transfer Switch For Limited Service Pump Controller

Model: GLU

Terminal Diagram and Sizing

Built to the latest edition of the NFPA 20 standard

Power Terminals



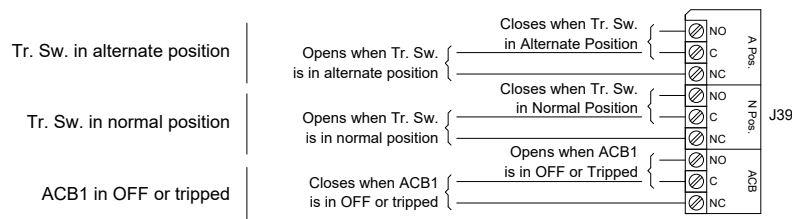
- Notes:
- 1 - Controller is phase sensitive. Incoming lines must be connected in ABC sequence.
 - 2 - Field wiring and lug sizes are based on copper conductors only. Do not use aluminium conductors.

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

Bending Space	5 " (127 mm)						
	(Use Copper Conductors Only)						
HP Voltage	5	7.5	10	15	20	25	30
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)
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)
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)
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)
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)

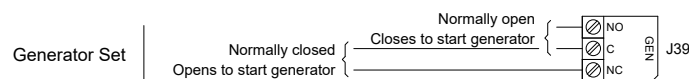
Remote Alarm Terminals (TSB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Control Terminals (TSB1)

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Drawing for information only.
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Contact manufacturer for "As Built" drawing.