TORNATECH

Project: _____

Customer: _____

Engineer: _____

Pump Manufacturer: _____

Technical Data
Submittal Document

Model GFD

Diesel Engine Driven Fire Pump Controller

Contents:

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.

CE OPTIONAL UKCA OPTIONAL

May 2024

Technical Data
Model GFD Diesel Fire Pump Controller

<table>
<tr><td rowspan="4">Standard, Listings, Approvals and Certifications</td><td colspan="3">Built to NFPA 20</td></tr>
<tr><td>CE & UKCA Mark</td><td colspan="2">Various EN, IEC & CEE directives and standards</td></tr>
<tr><td colspan="2">Built in Canada or U.A.E</td><td>Built in Europe</td></tr>
<tr><td colspan="2">☐ CE Mark (only) Option</td><td>Supplied as Standard</td></tr>
<tr><td rowspan="7">Enclosure</td><td colspan="3">Protection Rating: ☐ Standard: IP55</td></tr>
<tr><td colspan="3">Optional</td></tr>
<tr><td>☐ NEMA 12</td><td>☐ NEMA 4X-304 sst painted</td><td rowspan="2">☐ IP65</td></tr>
<tr><td>☐ NEMA 3</td><td>☐ NEMA 4X-304 sst brushed finish</td></tr>
<tr><td>☐ NEMA 3R</td><td>☐ NEMA 4X-316 sst painted</td><td rowspan="2">☐ IP66</td></tr>
<tr><td>☐ NEMA 4</td><td>☐ NEMA 4X-316 sst brushed finish</td></tr>
<tr><td colspan="2">Accessories
• Bottom entry gland plate
• Lifting Lugs
• Keylock handle</td><td>Paint Specifications
• Red RAL3002
• Powder coating
• Glossy textured finish</td></tr>
<tr><td>Ambient Temperature Rating</td><td colspan="3">Standard
☐ 4°C to 40°C / 39°F to 104°F
Optional
☐ 4°C to 55°C / 39°F to 131°F</td></tr>
<tr><td rowspan="4">General</td><td>AC</td><td colspan="2">☐ 120V / 1ph / 60hz
☐ 208V to 240V / 1ph / 50-60hz</td></tr>
<tr><td>DC</td><td colspan="2">☐ 12VDC
☐ 24VDC</td></tr>
<tr><td>Grounding system</td><td colspan="2">• Negative</td></tr>
<tr><td>Battery chargers</td><td colspan="2">• Two independent fully automatic
• 10A continuous charge
• 500mA trickle charge</td></tr>
<tr><td>Electrical Reading</td><td colspan="3">• Battery 1 & Battery 2 voltage
• Battery 1 & Battery 2 charging amperage
• Charging mode</td></tr>
<tr><td>Pressure Reading</td><td colspan="3">• Continuous system pressure display
• Cut-in and cut-out pressure setting</td></tr>
<tr><td>Pressure and Event Recorder</td><td colspan="3">• 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</td></tr>
</table>

CE OPTIONAL UKCA OPTIONAL

Pressure sensing	• Pressure transducer and run test solenoid valve assembly for fresh water application • Pressure sensing connection 1/2" Female NPT • Drain connection 3/8" • Rated and calibrated for 0-500psi working pressure (calibrated at 0-300psi) • Externally mounted with protective cover
Audible Alarm	Alarm buzzer - 85dB at 3 meters
Visual Indications	• Engine run • Main switch AUTO • Main switch in OFF • Main switch in HAND • Periodic test • Cranking Cycle • AC Power available • Pump room temperature (ºF or ºC)
Visual & Audible Alarms	Visual only • Pump room trouble • Pump on demand • AC Failure • Weak battery 1 & 2 • Battery 1 & 2 overvoltage • High fuel level • PLD low suction pressure • Low pump room temperature • Service required • ECM warning • Weekly test cut-in not reached • Check weekly test solenoid • Pressure transducer fault • Invalid Cut-In Visual and Audible • Engine trouble • Controller trouble • Engine low oil pressure • Engine high temperature • Engine low temperature • Engine overspeed • DC Failure • Battery 1 & 2 Failure • Engine fail to start • Low fuel level • ECM fault • ECM SS in Alternate Position • Fuel injection malfunction • Charger 1 & 2 Failure • Loss of continuity 1 & 2 • Fuel tank leak • High raw water temperature
Remote Alarm Contacts	DPDT-8A-250V.AC • Engine run • Common controller trouble • Charger #1 & Charger #2 failure • Pressure transducer fault • Common engine trouble • High engine temperature • Battery #1 & battery #2 failure • Overspeed • Fail to start • DC failure • Fail when running • Fuel injection malfunction** • Loss of continuity (starter) #1 and/or #2 • Low oil pressure • ECM selector switch in alternate position*** • PLD low suction pressure • Common pump room trouble (field re-assignable)* • Low fuel level • Low pump room temperature • AC Failure • High fuel level • High pump room temperature • Fuel tank leak • H-O-A selector switch in OFF or HAND • Free (field programmable)*

*Except if option C13 is ordered. Tornatech reserves the right to use any of these four alarm points for special specific application requirements
**Applicable to electronic engines only.
*** Applicable to electronic engines only. Alarms when ECM selector switch on the engine is in alternate mode.

Terminals for Field Connections for External Devices	• Low fuel level • Remote AUTOMATIC start • Water reservoir low (re-assignable) • Fuel tank leak (re-assignable) • High fuel level (re-assignable)		
ViZiTouch V2.1 Operator Interface	• Embedded microcomputer with software PLC logic • 7.0” color touch screen (HMI technology) • Upgradable software • Multi-language		
Operation	**Selector Switch**	• Hand-Off-Auto • Behind lockable and breakable cover	
	Automatic Start	• Start on pressure drop • Remote start signal from automatic device	
	Manual Start	• Crank 1 and Crank 2 start pushbuttons • Run test pushbutton	

	Crank Cycle	• 6 consecutive cycle attempts
		  • 3 X 15s crank from battery 1 or 2 alternatively
		  • 15s rest in between each crank attempt	

	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
Communication Protocol Capability	• Protocol: Modbus • Connection type: Shielded female connector RJ45 • Frame Format: TCP/IP • Addresses: See bulletin MOD-GPD		

Alarm and shutdown schedule		Automatic Start	Manual or Remote Start	Run Test or Periodic Test
	High Coolant	Alarm only	Alarm only	Shutdown
	Low Oil Pressure	Alarm only	Alarm only	Shutdown
	Overspeed	Shutdown	Shutdown	Shutdown

**** Automatic shutdown shall be approved by the AHJ.

☐ A1	Periodic test alarm contact (Form C-SPDT)
☐ A2	Overspeed alarm contact (Form C-SPDT)
☐ A3	Low oil pressure alarm contact (Form C-SPDT)
☐ A4	High coolant temperature alarm contact (Form C-SPDT)
☐ A5	Failure to start alarm contact (Form C-SPDT)
☐ A6	Battery 1 & 2 failure alarm contact (2 x Form C-SPDT)
☐ A7	Charger 1 & 2 failure alarm contact (2 x Form C-SPDT)
☐ A8	AC failure alarm contact (Form C-SPDT)
☐ A11	Extra controller trouble alarm contact (Form C-SPDT)
☐ A12	Extra engine trouble alarm contact (Form C-SPDT)
☐ Ax	Additional engine alarm contact alarm contact (Form C-SPDT) (specify function)
☐ AX45	Engine coolant NO FLOW alarm
☐ B1	Low fuel level alarm contact (Form C-SPDT)
☐ B2	Water reservoir level low alarm contact (Form C-SPDT)
☐ B3	Water reservoir empty alarm contact (Form C-SPDT)
☐ B4	Low pump room temperature alarm contact (Form C-SPDT)
☐ B5	High fuel level alarm contact (Form C-SPDT)
☐ B6	Low system pressure alarm contact (Form C-SPDT)
☐ B7	Low suction pressure alarm contact (Form C-SPDT)
☐ B8	Pump on demand alarm contact (Form C-SPDT)
☐ B9	Fuel tank leak alarm contact (Form C-SPDT)
☐ B10	Main relief valve open alarm contact (Form C-SPDT)
☐ B11	Flow meter loop valve open alarm contact (Form C-SPDT)
☐ B12	Water reservoir level high alarm contact (Form C-SPDT)
☐ B13	High pump room temperature alarm contact (Form C-SPDT)
☐ Bx	Other addition alarm contact alarm contact (Form C-SPDT) (specify function)
☐ C5	CE Mark with factory certificate
☐ C6	Nickel – cadmium battery chargers
☐ C7	Engine block heater circuit (same voltage as battery charger primary)
☐ C9	Non pressure actuated controller w/o pressure transducer and run test solenoid valve

☐ C13	Louver activation circuit (battery power specific)
☐ C13A	Louver activation circuit when engine is not running 24VDC controller with 24VDC louver motor
☐ C13F	Louver activation circuit when engine is not running 24VDC controller with 12VDC louver motor
☐ C14	Delayed automatic start on AC power failure (factory set at 15 minutes)
☐ C19	Lockout/interlock circuit from equipment installed inside the pump room
☐ D4A	Addition of run test solenoid valve for fresh water rated for 0-500psi
☐ D6A	Addition of run test solenoid valve for sea water rated for 0-500psi
☐ D7B	Low fuel level float 1-1/2” (supplied as separate item)
☐ D8B	High fuel level float 1-1/2” (supplied as separate item)
☐ D9A	Anti-condensation heater & thermostat
☐ D9B	Anti-condensation heater & humidistat
☐ D9C	Anti-condensation heater & thermostat & humidistat
☐ D11	Low suction pressure transducer for fresh water rated for 0-300psi with visual indication and alarm contact
☐ D11A	Low suction pressure transducer for sea water rated for 0-300psi with visual indication and alarm contact
☐ D12	Tropicalization
☐ D25	Mounting stand (steel, painted)
☐ D25A	Mounting stand stainless steel-304 painted
☐ D25B	Mounting stand stainless steel-304 brushed finish
☐ D25C	Mounting stand stainless steel-316 painted
☐ D25D	Mounting stand stainless steel-316 brushed finish
☐ D28A	Field programmable i/o board - 5 input /5 output (NOTE: If more than 5 input or 5 output are required, please order this option as many times as required (max.8)
☐ D30	Redundant pressure transducer for fresh water rated for 0-500psi
☐ D31	Redundant pressure transducer for sea water rated for 0-500psi
☐ D32A	Modbus TCP/IP provision
☐ I01	Gauge option package c/w tachometer, speed switch, oil pressure and coolant temperature (senders by others)
☐ I02	Fuel level gauge (sender by others)

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

☐ L01	Other language and English (bilingual)
☐ L02	French
☐ L03	Spanish
☐ L04	German
☐ L05	Italian
☐ L06	Polish
☐ L07	Romanian
☐ L08	Hungarian
☐ L09	Slovakian
☐ L10	Croatian
☐ L11	Czech
☐ L12	Portuguese
☐ L13	Dutch
☐ L15	Turkish
☐ L16	Swedish
☐ L21	Danish
☐ L25	Chinese
☐ L28	Finnish
☐ L29	Norwegian

Additional Options:

☐ _____

☐ _____

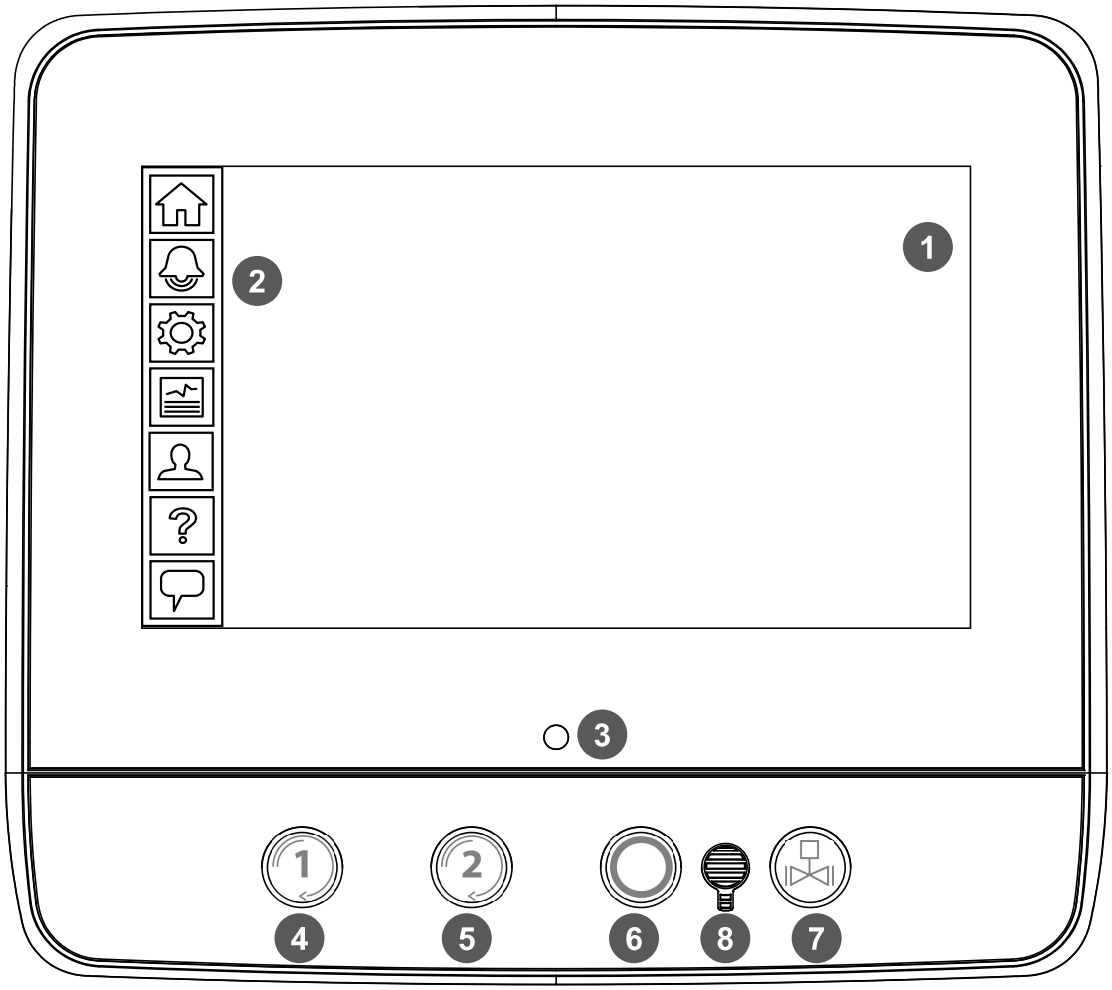
☐ _____

☐ _____

☐ _____

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 - CRANK 1 button
5 - CRANK 2 button
6 - STOP button
7 - RUN TEST button
8 - Alarm buzzer

TORNATECH

	BY	DD/MM/YY
DRAWN BY	ACD	01/02/24
FINAL APPROVAL	FC	01/02/24

DIESEL ENGINE FIRE PUMP CONTROLLER 12VDC OR 24VDC NEGATIVE GROUND

MODEL: GFD

BUILT TO NFPA20

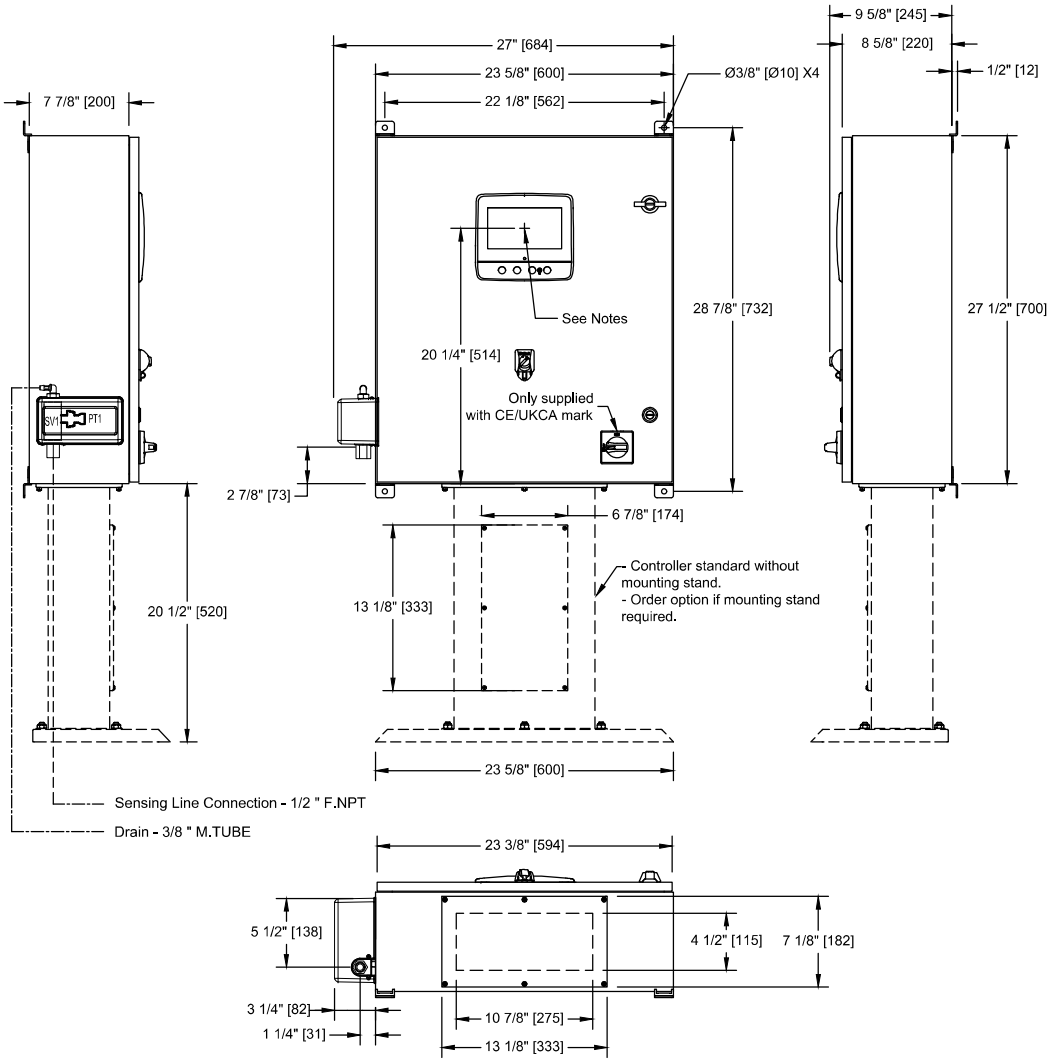
UK CA CE Optional

THIRD ANGLE PROJECTION

DRAWING NUMBER GFD-DI800/E

DWG REV. 0

SHEET 1 OF 1



Notes:

- Standard: IP55
- Standard paint : textured red RAL 3002.
- All dimensions are in inches [millimeters].
- Center of screen: 20-1/4" [514] 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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DIESEL ENGINE FIRE PUMP CONTROLLER
12VDC OR 24VDC NEGATIVE GROUND

MODEL: GFD

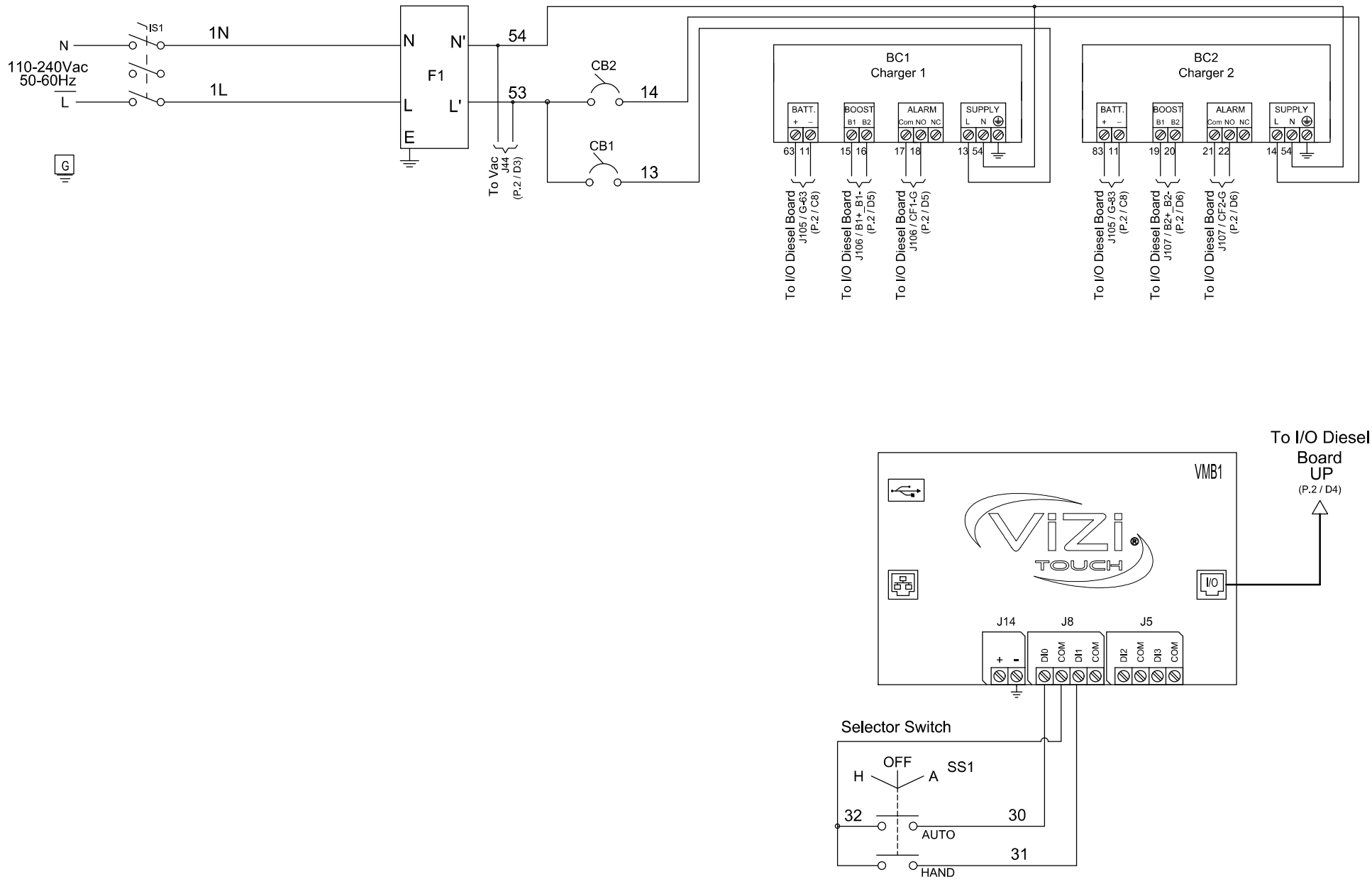
BUILT TO NFPA20

UK CA CE Optional

DRAWING NUMBER GFD-WS800/E

DWG REV. 0

SHEET 1 OF 2



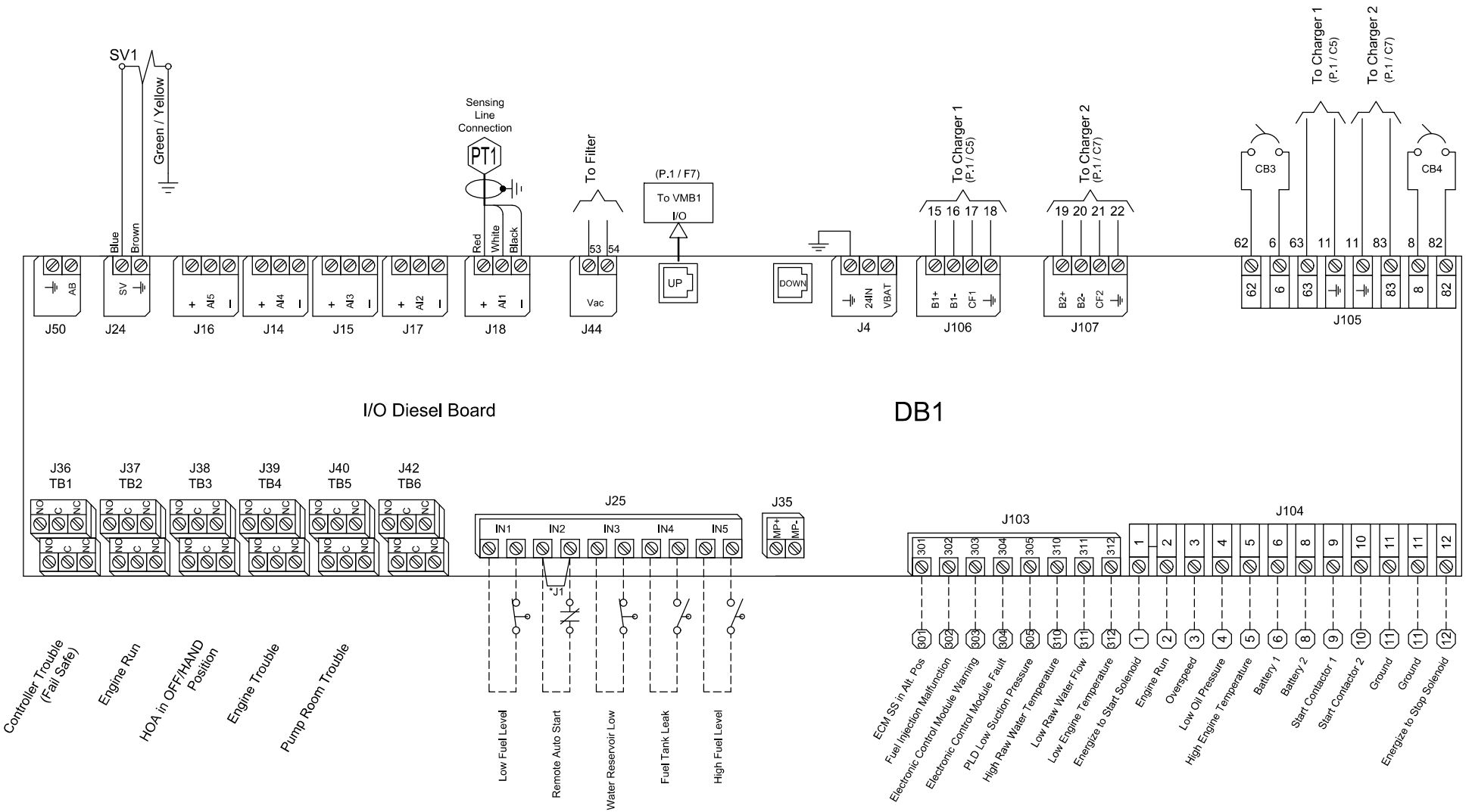
	BY	DD/MM/YY
DRAWN BY	ACD	01/02/24
FINAL APPROVAL	FC	01/02/24

DIESEL ENGINE FIRE PUMP CONTROLLER
12VDC OR 24VDC NEGATIVE GROUND

MODEL: GFD
BUILT TO NFPA20

UK CA CE Optional

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



* Remove this jumper to use this feature

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DIESEL ENGINE FIRE PUMP CONTROLLER 12VDC OR 24VDC NEGATIVE GROUND

MODEL: GFD

BUILT TO NFPA20

UK CA CE Optional

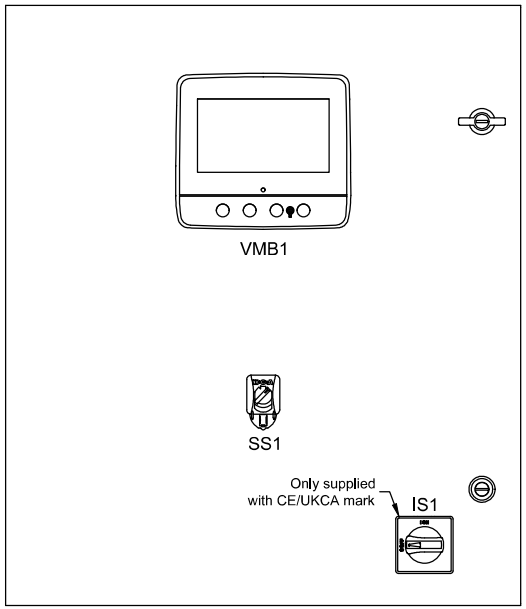
THIRD ANGLE PROJECTION

DRAWING NUMBER GFD-LY800/E

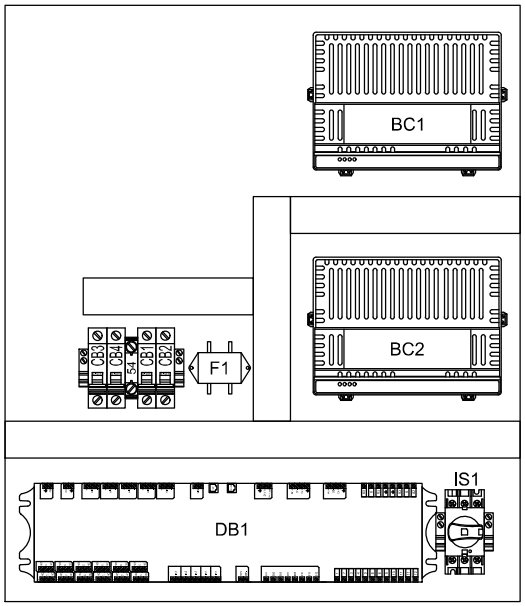
DWG REV. 0

SHEET 1 OF 1

Designation	Description
BC1-BC2	Battery Charger #1 and #2
CB1-2	Magnetic Breaker 1 Pole 10 A
CB3-4	Magnetic Breaker 1 Pole 16 A
DB1	I/O Diesel Board
F1	Filter
IS1	Isolating Switch
SS1	Lockable 3 Position Selector Switch
VMB1	Main Board



Front Door Layout



Internal Layout

	BY	DD/MM/YY
DRAWN BY	ACD	01/02/24
FINAL APPROVAL	FC	01/02/24

DIESEL ENGINE FIRE PUMP CONTROLLER
12VDC OR 24VDC NEGATIVE GROUND

MODEL: GFD

BUILT TO NFPA20

UK CA CE Optional

DRAWING NUMBER GFD-TD800/E

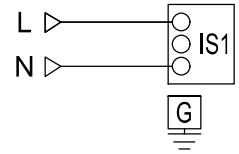
DWG REV. 0

SHEET 1 OF 1

Power Supply

Terminals Wire Size:
14 - 6 AWG
1.8-2 Nm

110-240Vac
50-60Hz



Engine Connections

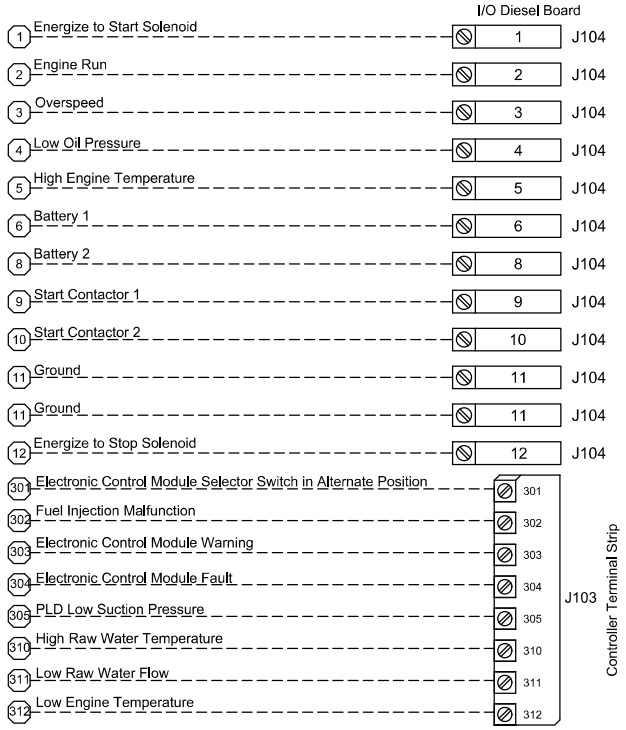
All wiring between the controller and diesel engine shall be stranded (NFPA20)

Wiring between controller and engine (terminals 301, 302, 303, 304, 305, 310, 311, 312, 2, 3, 4, 5) must be #14AWG as minimum.

Wiring between controller and engine (terminals 12 [rated at 10A or 22A for 20 seconds] 1, 9, 10 [rated at 10A]) must be stranded #10AWG as minimum.

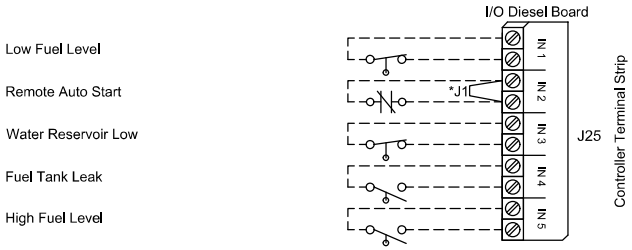
Wiring between controller and engine (terminals 6, 8, 11 [rated at 30A]) must be stranded and sized according to distance.

0-5' (0-1.5m) - 12 AWG (4 mm2)
6-10' (1.8-3m) - 10 AWG (6 mm2)
11-15' (3.3-4.5m) - 8 AWG (10 mm2)
16-20' (4.8-6m) - 2x10 AWG (2x6 mm2)
21-32' (6.4-9.75m) - 2x8 AWG (2x10 mm2)



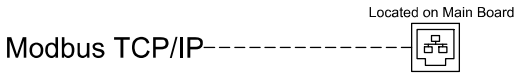
Field Connections

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



Network Connections

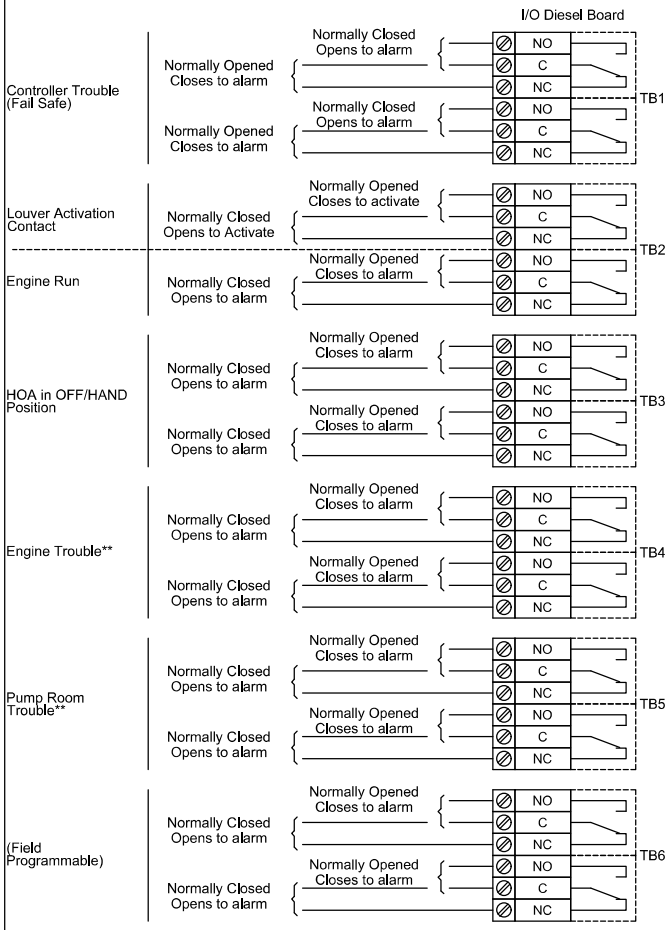
Terminals Wire Size:
Shielded Female Connector RJ45



* Remove this jumper to use this feature

Alarm Contacts

Terminals Wire Size:
24 - 12 AWG
0.5 Nm



** Re-assignable

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FINAL APPROVAL	FC	01/02/24

DIESEL ENGINE FIRE PUMP CONTROLLER
12VDC OR 24VDC NEGATIVE GROUND

MODEL: GFD

BUILT TO NFPA20

UK CA CE Optional

DRAWING NUMBER GFD-TD801/E

DWG REV. 0

SHEET 1 OF 1