FTA1100-J Diesel Engine Fire Pump Controllers

STANDARD SUBMITTAL PACKAGE

(DRAWINGS INCLUDED IN THIS PACKAGE ARE FOR STANDARD CONTROLLERS. ACTUAL "AS BUILT" DRAWINGS MAY DIFFER FROM THOSE SEEN HERE).

SBP1100J(A)

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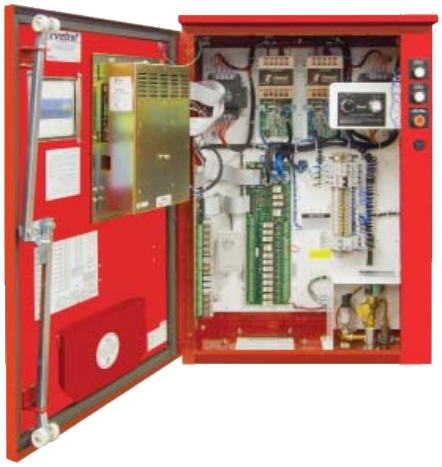
FTA1100J Diesel Engine Fire Pump Controllers
Product Description



Description – Firetrol® combined automatic and manual Mark IIXG based diesel engine fire pump controllers are intended for starting and monitoring fire pump diesel engines. They are suitable for use with both mechanical and electronic type engines. The controller is available for 12 or 24 volt negative ground systems, using lead acid or Nickel-Cadmium batteries. The controller monitors, displays and records fire pump system information.

Approvals – Firetrol fire pump controllers are listed by Underwriters' Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers*, CSA, *Standard for Industrial Control Equipment* (cUL), and approved by Factory Mutual. They are built to meet or exceed the requirements of the approving authorities as well as NEMA and the latest editions of NFPA 20, *Installation of Centrifugal Fire Pumps*, and NFPA 70, *National Electrical Code*.

Standard Features – The following are included as standard with each controller:

- AC Line & Battery circuit breakers
- Manual-Off-Auto selector switch
- Manual test push-button
- Two manual crank push-buttons
- Two 10 Amp battery chargers with 4 stage charging cycle, selectable AC voltage (110 / 220), selectable DC voltage (12 / 24), and selectable battery type (Lead Acid, Ni-Cad 9/18 Cell, Ni-Cad 10/20 Cell)
- Door mounted display/interface panel featuring a 128 x 64 pixel backlit LCD graphical display, Membrane Type User Control Push-buttons and easy to read LED Indicators for:
  - *AC POWER AVAILABLE*
  - *ALARM*
  - *MAIN SWITCH IN AUTO*
  - *MAIN SWITCH IN MANUAL*
  - *SYSTEM PRESSURE LOW*
  - *ENGINE RUNNING*
  - *ENGINE FAIL TO START*
  - *ENGINE TEMPERATURE HIGH*
  - *ENGINE OIL PRESSURE LOW*
  - *ENGINE OVERSPEED*
  - *ENGINE ALTERNATE ECM*
  - *ENGINE FUEL INJECTOR MALFUNCTION*
  - *FUEL LEVEL LOW*
  - *AUTOMATIC SHUTDOWN DISABLED*
  - *CHARGER MALFUNCTION*
  - *BATTERY #1 TROUBLE*
  - *BATTERY #2 TROUBLE*
- Minimum Run Timer / Off Delay Timer
- Programmable Daylight Saving Time Option
- Weekly Test Timer
- Engine Run Time Meter
- Digital Pressure Display
- USB Host Controller and Port
- Solid State Pressure Transducer
- Data Log
- Event Log (3000 events)
- Simultaneous Display of Battery Voltages, Charging Rates, AC Volts, Pressure and Alarm Messages
- Disk Error Message
- Disk Near Full Message
- Pressure Error Message
- Fail to Start Message
- Low Suction Pressure Message
- Crank Cycle Status Indication (Displays Cranking Battery, Number of Starting Attempts and Crank/Rest Time Remaining)
- 300 psi (20.7 bar) wet parts (solid state pressure transducer, solenoid valve, plumbing) for fresh water applications
- NEMA Type 2 enclosure (IEC IP22)
- Each standard controller comes with user set options for:
  - AC Power Loss Start
  - Low Pressure Aud.
  - Main Sw. Mis-Set
  - Pump Run Alarm
  - User Defined Input
  - Low Pump Rm Temp
  - Relief Valve Open
  - High Reservoir
  - Interlock Alarm
  - Low Suction
  - Manual Test
  - Remote Start
  - Weekly Test Setup
  - Low Reservoir
  - High Fuel Level
- Also included (as required) are Audible/Visible alarm notifications for:
  - Electronic Engine Control Module (ECM) Warning
  - Electronic Engine Control Module (ECM) Failure
  - Low Engine Temperature
  - High Raw Cooling Water Temperature
  - Low Raw Water Flow (Clogged Stainer)
  - Fuel Spill (Interstitial Space Liquid Intrusion)
  - Low Suction Pressure (At Variable Speed Suction Limiting Engine Controls)

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FTA1100J Diesel Engine Fire Pump Controllers Specifications

Diesel Engine Fire Pump Controller

The fire pump controller shall be a factory assembled, wired and tested unit and shall conform to all the requirements of the latest edition of NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection* and NFPA 70, *National Electrical Code*.

The controller shall be listed by Underwriters Laboratories, Inc., in accordance with UL218, *Standard for Fire Pump Controllers*, CSA, and Canadian Standards Association CSA-C22.2, *Standard for Industrial Control Equipment (cULus) and* approved by Factory Mutual.

The controller shall be:

□ 12 Volt
□ 24 Volt

and shall be compatible with either mechanical or electronic type engines.

The controller components shall be housed in a NEMA Type 2 (IEC IP22) drip-proof, wall mounted enclosure.

Operator Interface

The fire pump controller shall feature an operator interface with user keypad. The interface shall monitor and display motor operating conditions, including all alarms, events, and pressure conditions. All alarms, events, and pressure conditions shall be displayed with a time and date stamp. The display shall be a 128x64 Backlit LCD capable of customized graphics. The display and interface shall be NEMA rated for Type 2, 3R, 4, 4X, and 12 protection and shall be fully accessible without opening the controller door. The display and user interface shall utilize multiple levels of password protection for system security. A minimum of 3 password levels shall be provided.

Digital Status/Alarm Messages

The digital display shall indicate text messages for the status and alarm conditions of:

- Engine Run
- Minimum Run Time / Off Delay Time
- Engine Fail to Start
- Low Suction Pressure
- Drive Not Installed
- Disk Error
- Disk Near Full
- Pressure Error
- Sequential Start Time
- Crank/Rest Time Cycle
- Low Engine Temp.
- Interstitial/Fuel Spill
- Remote Start
- System Battery Low
- Manual Engine Crank
- Electronic Control Module (ECM) Warning
- ECM Failure
- Low Suction Pressure PLD (pressure limiting driver)
- High Raw Water Temp.
- Clogged Raw Water Strainer

The Sequential Start Timer, Minimum Run Timer/Off Delay Timer and Crank/Rest time shall be displayed as numeric values reflecting the value of the remaining time.

LED Visual Indicators

LED indicators, visible with the door closed, shall indicate:

- AC Power Available
- Alarm
- Main Switch In Auto
- Main Switch In Manual
- System Pressure Low
- Engine Running
- Engine Fail To Start
- Engine Temperature High
- Engine Oil Pressure Low
- Engine Overspeed
- Engine Alternate ECM
- Engine Fuel Injector Malfunction
- Fuel Level Low
- Automatic Shutdown Disabled
- Charger Malfunction
- Battery #1 Trouble
- Battery #2 Trouble

Data Logging

The digital display shall monitor the system and log the following data:

- Motor Calls/Starts
- Pump Total Run Time
- Last Pump Run time
- Controller Power On Time
- Last Pump Start
- Minimum System Pressure
- Maximum System Pressure
- Last High Temp.
- Last Low Oil Pressure
- Last Engine Overspeed
- Last Low Fuel Level
- Last Charger Fail
- Last Battery Trouble
- Last Overspeed
- Battery #1 Volts (Min., Now, Max.)
- Battery #2 Volts (Min., Now, Max.)
- Battery #1 Amps (Min., Now, Max.)
- Battery #2 Amps (Min., Now, Max.)

Event Recording

Memory - The controller shall record all operational and alarm events to system memory. All events shall be time and date stamped and include an index number. The system memory shall have the capability of storing 3000 events and allow the user access to the event log via the user interface. The user shall have the ability to scroll through the stored messages in groups of 1, 10.

USB Host Controller

The controller shall have a built-in USB Host Controller. A USB port capable of accepting a USB Flash Memory Disk shall be provided. The controller shall save all operational and alarm events to the flash memory on a daily basis. Each saved event shall be time and date stamped. The total amount of historical data saved shall solely depend on the size of the flash disk utilized. The controller shall have the capability to save settings and values to the flash disk on demand via the user interface.

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Solid State Pressure Transducer

The controller shall be supplied with a solid state pressure transducer with a range of 0-300 psi (0-20.7 bar) ±1 psi. The solid state pressure switch shall be used for both display of the system pressure and control of the fire pump controller. Systems using analog pressure devices or mercury switches for operational control will not be accepted.

The START, STOP and SYSTEM PRESSURE shall be digitally displayed and adjustable through the user interface. The pressure transducer shall be mounted inside the controller to prevent accidental damage. The pressure transducer shall be directly pipe mounted to a bulkhead pipe coupling without any other supporting members. Field connections shall be made externally at the controller coupling to prevent distortion of the pressure switch element and mechanism.

Operation

A digitally set On Delay (Sequential Start) timer shall be provided as standard. Upon a call to start, the user interface shall display a message indicating the remaining time value of the On Delay timer.

The controller shall be field programmable for manual stop or automatic stop. If set for automatic stopping, the controller shall allow the user to select either a Minimum Run Timer or an Off Delay Timer. Both timers shall be programmable through the user interface.

The controller shall include an AC Power Loss start timer to start the engine in the event of AC Power failure.

A weekly test timer shall be provided as standard. The controller shall have the ability to program the time, date, and frequency of the weekly test. In addition, the controller shall have the capability to display a preventative maintenance message for a service inspection. The message text and frequency of occurrence shall be programmable through the user interface.

A Lamp Test feature shall be included. The user interface shall also have the ability to display the status of the system inputs and outputs.

An Audible Test feature shall be included to test the operation of the audible alarm device.

Seismic Certification

The controller shall be certified to meet or exceed the requirements of the 2006 International Building Code and the 2010 California Building Code for Importance Factor 1.5 Electrical Equipment for Sds equal to 1.88 or less severe seismic regions. Qualifications shall be based upon successful tri-axial shake-table testing in accordance with ICC-ES AC-156. Certification without testing shall be unacceptable. Controller shall be clearly labeled as rated for installation in seismic areas and a Certificate of Conformance shall be provided with the controller.

Battery Chargers

The controller shall include two fully automatic, 200 amp hour, 4 step battery chargers. The chargers shall feature a qualification stage, in which the batteries are examined by the charger to insure that they are not defective and are capable of accepting a charge. The battery charger shall feature:

- Selectable AC Power Voltage
- Selectable Battery Voltage
- Selectable Battery Type
- Charge Cycle Reset Push-button

The controller shall be a Firetrol brand.

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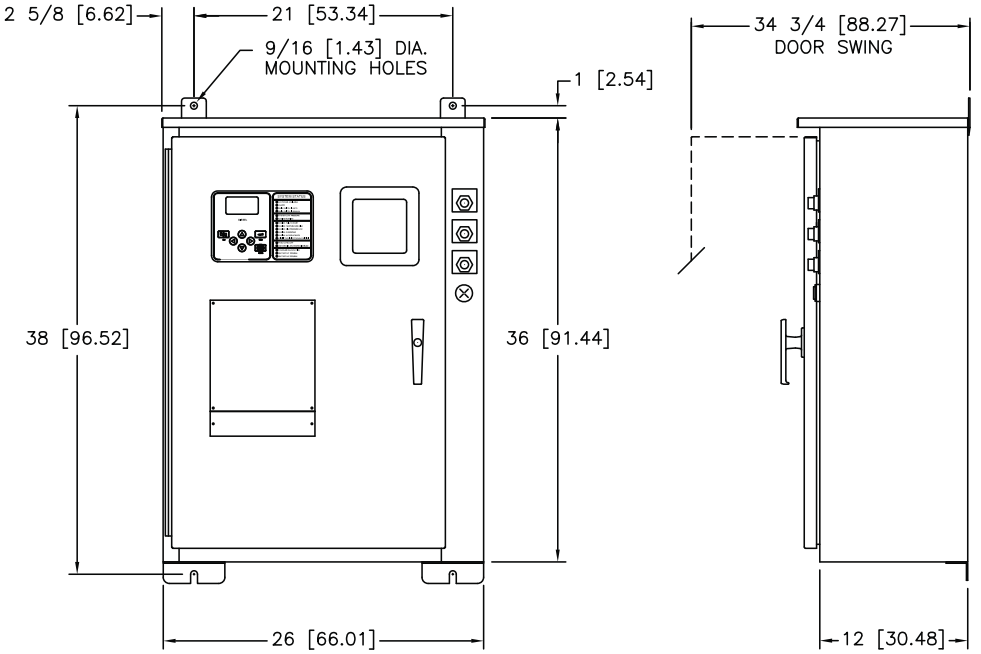
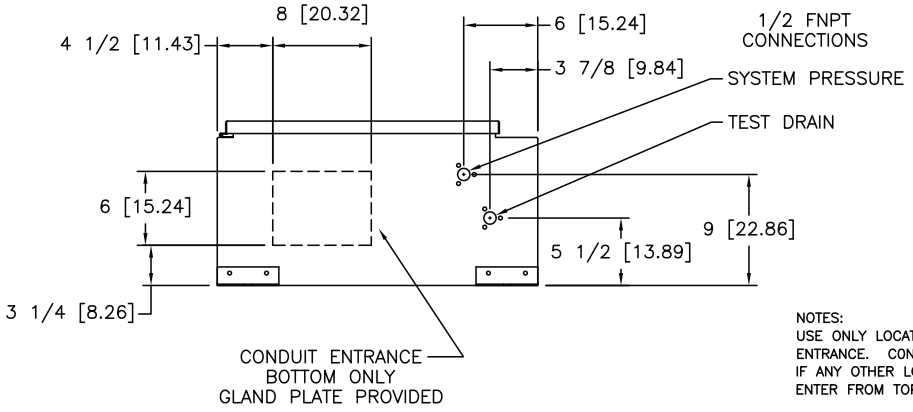
Cary, NC 27518
Tel +1 919 460 5200 • Fax +1 919 460 5250

Firetrol.com

SP1100-50(C)

FTA1100J Diesel Engine Fire Pump Controllers
Dimensional Drawing





NOTES:
USE ONLY LOCATIONS SHOWN FOR CONDUIT ENTRANCE. CONTROLLER WARRANTY IS VOID IF ANY OTHER LOCATION IS USED. DO NOT ENTER FROM TOP.

NOT TO BE USED AS A JUNCTION BOX. DO NOT ROUTE ENGINE HEATER WIRING THROUGH CONTROLLER.

DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F (5°C)

DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12

ALL DIMENSIONS – INCHES [CM]
SHIPPING WEIGHT – POUNDS [KG]

FOR CONTROLLERS WITH 12" [30.5] FLOOR MOUNTING LEGS
MODIFICATION –N31 RE: DRAWING DD1100–21
FOR CONTROLLERS WITH 6" [15.24] BASE MOUNTING LEGS
MODIFICATION –N32 RE: DRAWING DD1100–22

APPROXIMATE SHIPPING WEIGHT
200 [90.7]

	REV. TO	ECN NO.	BY	APP.	DATE
CHANGED PRESSURE FITTING AND CONDUIT ENTRANCE DIMENSIONS	C	228698	JC	TEF	08–20–10
UPDATED TO MARK IIXG USER INTERFACE	B	225152	JC	TEF	11–11–09

DIMENSIONS AND SHIPPING WEIGHT | FTA1100–J
DIESEL ENGINE FIRE PUMP CONTROLLER
WALL MOUNT

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	TEF	12–14–02
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	TEF	12–14–02

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP–I–003. FOR PLASTIC PARTS SEE MP–I–055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

SCALE 1:1 | SIZE A

DWG. NO. DD1100-20

DRAWING REV. C | ECN NO. 228698 | SHEET 1 OF 1

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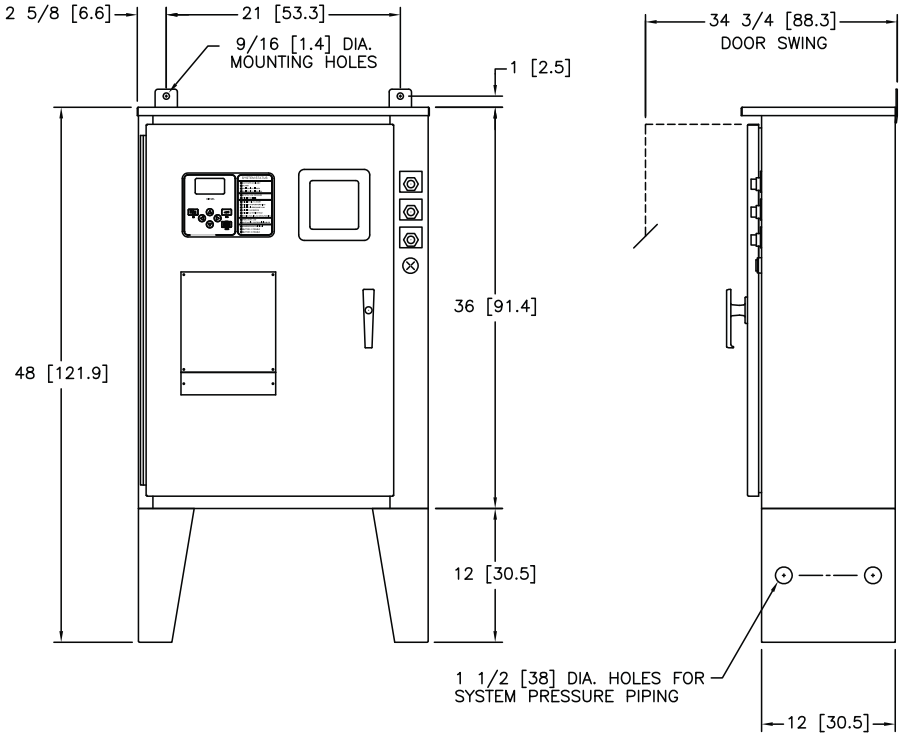
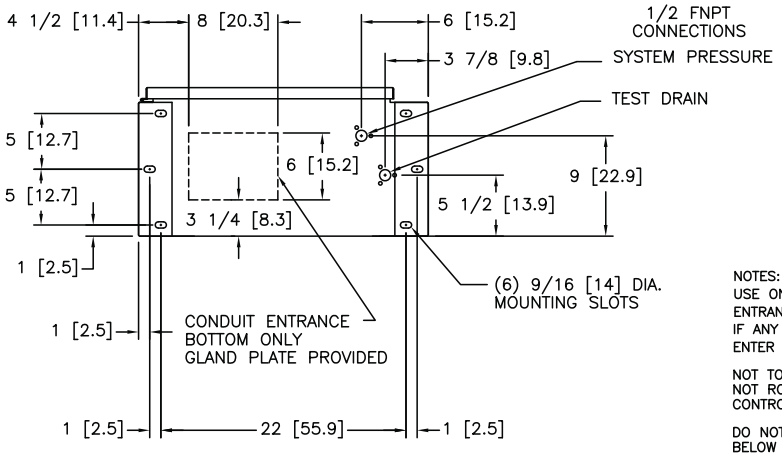
FTA1100J Diesel Engine Fire Pump Controllers
Dimensional Drawing





NOTES:
USE ONLY LOCATIONS SHOWN FOR CONDUIT ENTRANCE. CONTROLLER WARRANTY IS VOID IF ANY OTHER LOCATION IS USED. DO NOT ENTER FROM TOP.

NOT TO BE USED AS A JUNCTION BOX. DO NOT ROUTE ENGINE HEATER WIRING THROUGH CONTROLLER.

DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F (5°C)

DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12

ALL DIMENSIONS – INCHES [CM]
SHIPPING WEIGHT – POUNDS [KG]

APPROXIMATE SHIPPING WEIGHT
200 [90.7]

	REV. TO	ECN NO.	BY	APP.	DATE
CHANGED PRESSURE FITTING AND CONDUIT ENTRANCE DIMENSIONS	B	228698	JC	TEF	08-20-10
UPDATED TO MARK IIXG USER INTERFACE	A	225152	JC	TEF	11-11-09

DIMENSIONS AND SHIPPING WEIGHT — FTA1100-J
DIESEL ENGINE FIRE PUMP CONTROLLER
WITH MODIFICATION N31 (12" MOUNTING LEGS)

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	RW	11-17-03
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	TEF	11-17-03

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055

ASSEM. REF. NO.

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COMPUTER GENERATED DRAWING

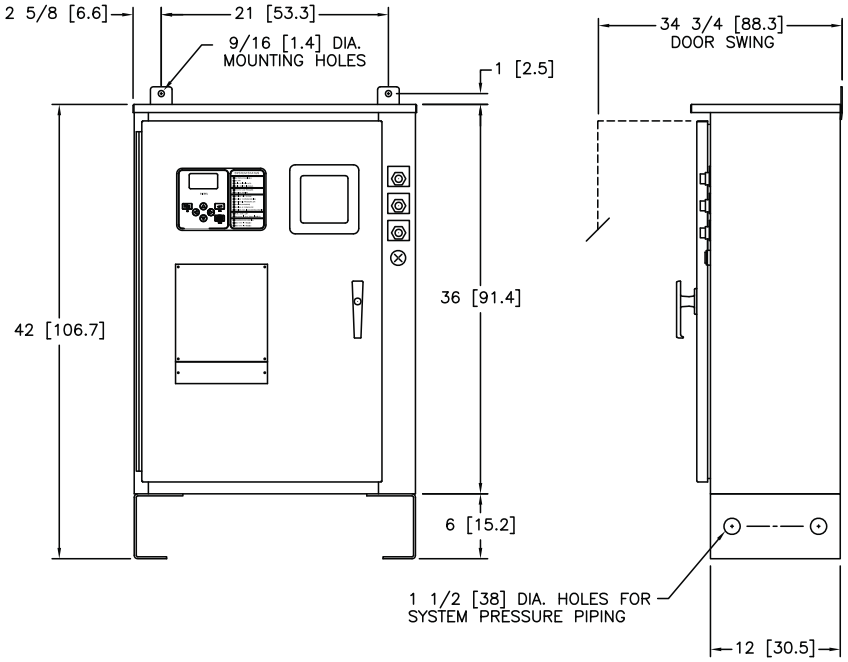
SCALE 1:1 | SIZE A

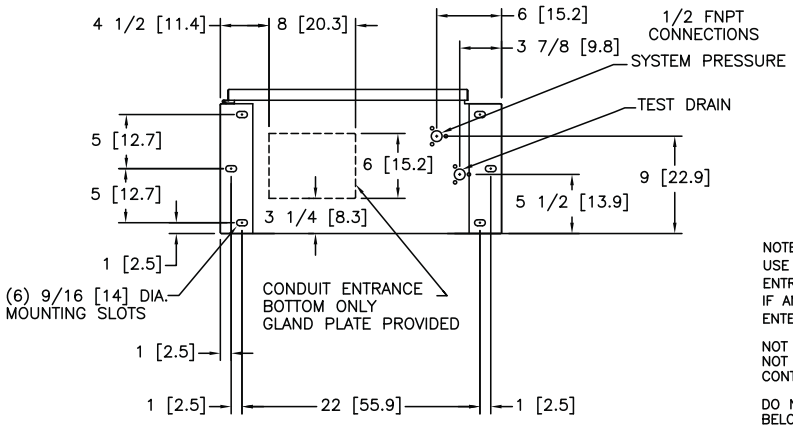
DWG. NO. DD1100-21

DRAWING REV. B | ECN NO. 228698 | SHEET 1 OF 1

Firetrol®

FTA1100J Diesel Engine Fire Pump Controllers
Dimensional Drawing





NOTES:
USE ONLY LOCATIONS SHOWN FOR CONDUIT ENTRANCE. CONTROLLER WARRANTY IS VOID IF ANY OTHER LOCATION IS USED. DO NOT ENTER FROM TOP.

NOT TO BE USED AS A JUNCTION BOX. DO NOT ROUTE ENGINE HEATER WIRING THROUGH CONTROLLER.

DO NOT INSTALL IN AMBIENT TEMPERATURES BELOW 41°F (5°C)

DIMENSIONS SHOWN ON THIS DRAWING ARE APPLICABLE FOR NEMA TYPES 2/3R/4/4X/12

ALL DIMENSIONS – INCHES [CM]
SHIPPING WEIGHT – POUNDS [KG]

APPROXIMATE SHIPPING WEIGHT
200 [90.7]

	REV. TO	ECN NO.	BY	APP.	DATE
CHANGED PRESSURE FITTING AND CONDUIT ENTRANCE DIMENSIONS	B	228698	JC	TEF	08-20-10
UPDATED TO MARK IIXG USER INTERFACE	A	225152	JC	TEF	11-11-09

DIMENSIONS AND SHIPPING WEIGHT | FTA1100-J
DIESEL ENGINE FIRE PUMP CONTROLLER
WITH MODIFICATION N32 (6" BASE MOUNTING LEGS

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	RW	01-17-03
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	TEF	01-07-03

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP-I-003. FOR PLASTIC PARTS SEE MP-I-055

ASSEM. REF. NO.

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COMPUTER GENERATED DRAWING

SCALE 1:1 | SIZE A

DWG. NO. DD1100-22

DRAWING REV. B | ECN NO. 228698 | SHEET 1 OF 1

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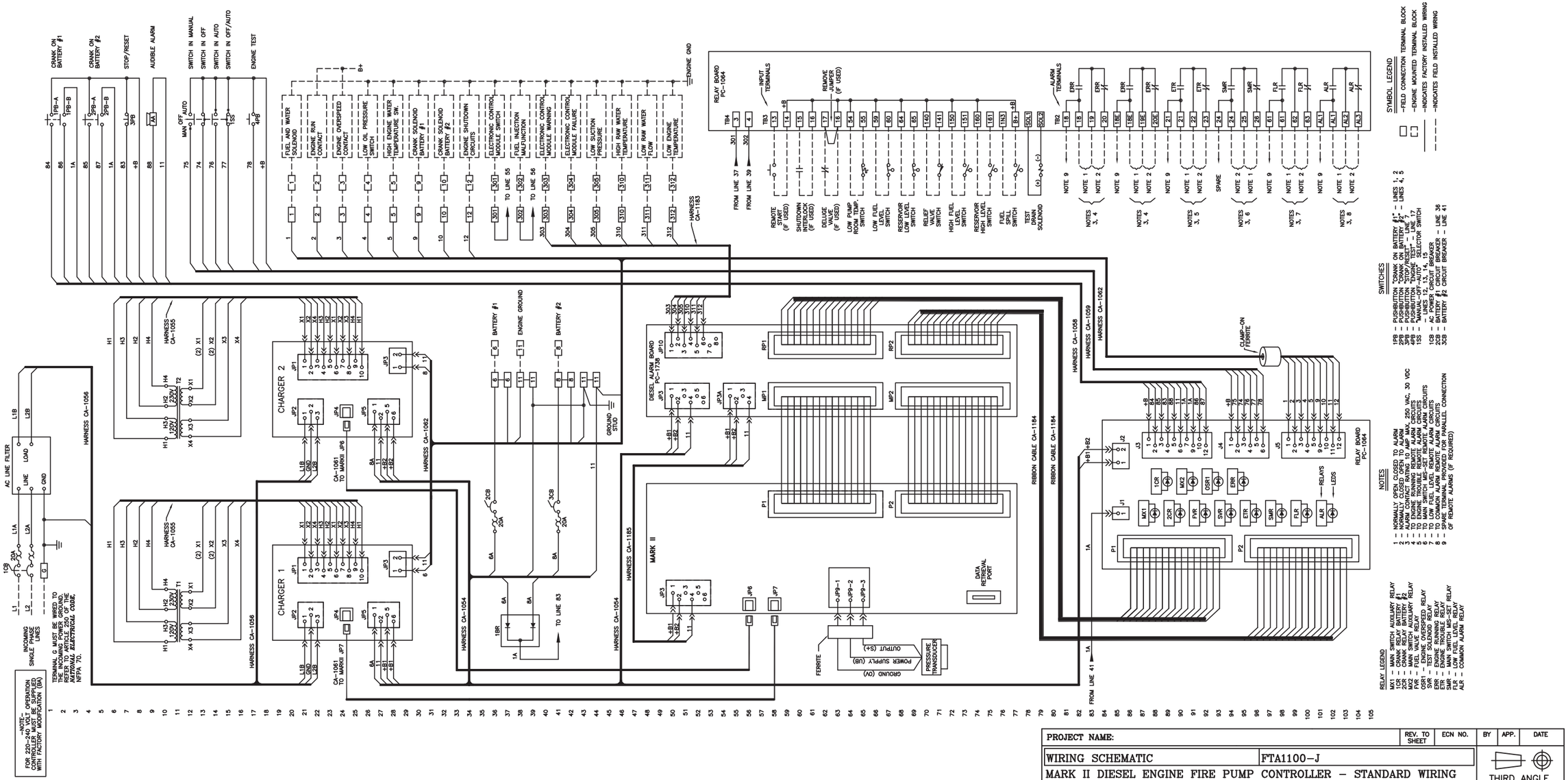
FTA1100J Diesel Engine Fire Pump Controllers
Wiring Schematic



REVISED PER FM & NFPA–20 ADDITIONAL ALARM REQUIREMENTS	G	255410	GFD	GFD	6/19/15
REVISED PRESSURE TRANSDUCER	F	229677	GFD	GFD	11/12/10
REVISED TEST DRAIIN SOLENOID CONNECTION & ADDED ELECTRONIC ENGINE TERMINALS	E	222294	GFD	GFD	4/1/09

PROJECT NAME:	REV. TO SHEET	ECN NO.	BY	APP.	DATE
WIRING SCHEMATIC — FTA1100–J					
MARK II DIESEL ENGINE FIRE PUMP CONTROLLER – STANDARD WIRING SCHEMATIC					THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	TEF	11/04/02
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	TEF	11/04/02

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP–I–003. FOR PLASTIC PARTS SEE MP–I–055

ASSEM. REF. NO.

ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.

COMPUTER GENERATED DRAWING

SCALE 1:1 | SIZE B

DWG. NO. WS1100–20

DRAWING REV. G | ECN NO. 255410 | SHEET 1 OF 1

Firetrol®

FTA1100J Diesel Engine Fire Pump Controllers
Field Connections

THIS FIELD CONNECTION DIAGRAM IS FOR DIESEL ENGINES LISTED FOR DRIVING CENTRIFUGAL FIRE PUMPS SUPPLIED BY THE FOLLOWING MANUFACTURERS:

CATERPILLAR, INC., ENGINE DIVISION, PEORIA, IL
CLARKE DETROIT DIESEL–ALLISON, INC. CINCINNATI, OH
CUMMINS ENGINE CO., INC., COLUMBUS, IN
DEUTZ CORP., NORCROSS, GA.
KIRLOSKAR CUMMINS, LTD., PUNE, INDIA

FOR ENGINES OR MANUFACTURERS NOT LISTED ABOVE, CONSULT THE FACTORY.

–NOTES–

1. IF CONTROLLER IS ARRANGED FOR OPERATION ON 220–240 VOLTS (MODIFICATION –BA) CONNECT TO THESE TERMINALS
2. TERMINAL G MUST BE WIRED TO INCOMING LINE BONDED GROUND. REFER TO ARTICLE 250, ***NATIONAL ELECTRICAL CODE***, NFPA70.
3. TERMINALS 1 THRU 12, 301 THRU 305, & 310 THRU 312 CONNECT TO LIKE NUMBERED TERMINALS ON THE ENGINE TERMINAL BLOCK. SOME ENGINES MAY NOT USE ALL TERMINALS. REFER TO ENGINE MANUFACTURER'S WIRING DIAGRAM FOR CORRECT CONNECTIONS.
4. ENGINE TROUBLE ALARM CIRCUITS OPERATE IF ANY ONE OR MORE OF THE FOLLOWING TROUBLES OCCUR: ENGINE OVERSPEED, LOW OIL PRESSURE, HIGH WATER TEMPERATURE, BATTERY CHARGER OR BATTERY FAILURE, FAILED TO START, AND STARTING CONTACTOR COIL FAILURE. ELECTRONIC ENGINE ALARMS (TERMINALS 301–312) ARE FIELD PROGRAMMABLE FOR INCLUSION IN ENGINE TROUBLE ALARM.
5. SPARE TERMINAL PROVIDED FOR PARALLEL CONNECTION OF REMOTE ALARMS (IF REQUIRED).
6. COMMON TROUBLE ALARM CIRCUIT OPERATES WHEN ANY ALARM OCCURS.

–GENERAL NOTES–

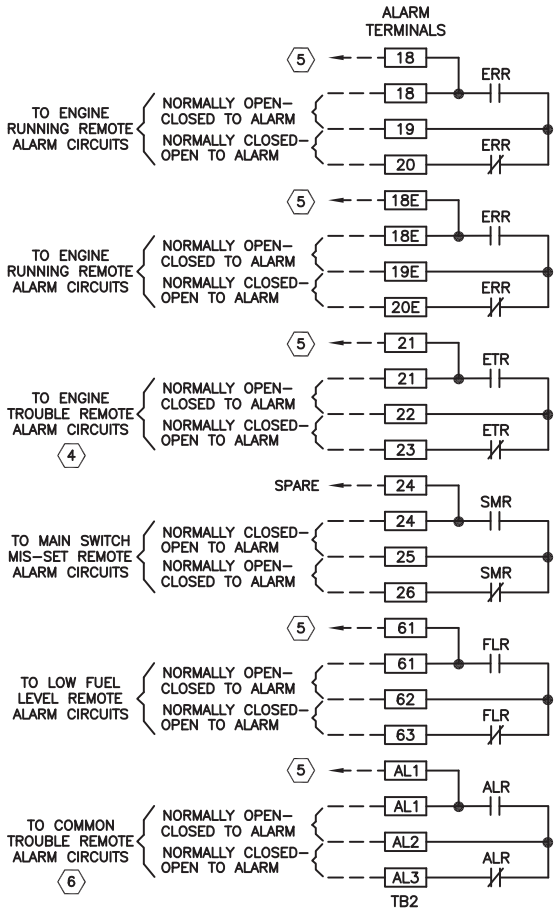
ALL ALARM CONTACTS ARE RATED FOR PILOT CIRCUIT DUTY, 250 VAC, 30 VDC MAXIMUM, 10 AMPERES, NON–INDUCTIVE.

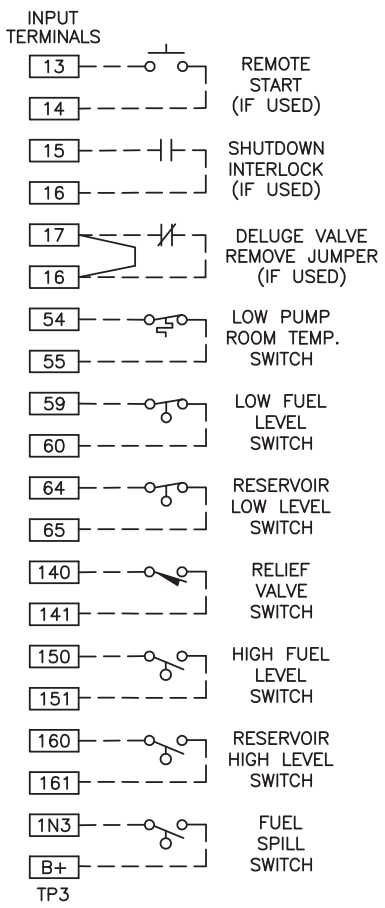
–WIRE SIZES–
COPPER CONDUCTORS ONLY

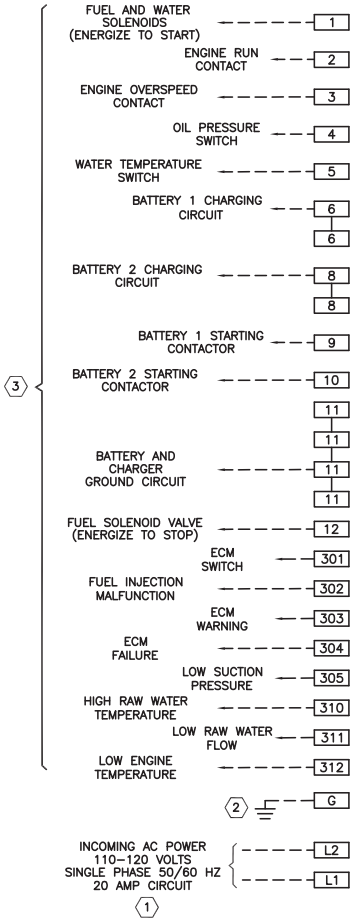
USE #14 AWG WIRE [16 MWG] MINIMUM FOR ALL ELECTRICAL CONNECTIONS EXCEPT FOR BATTERY CHARGER CONNECTIONS. (BATTERY CHARGERS CONNECTED TO TERMINALS 6, 8 AND 11) ON TERMINALS 6, 8 AND 11 USE THE FOLLOWING INFORMATION TO DETERMINE WIRE SIZES:

LINEAR FEET (IN CONDUIT RUN) FROM CONTROLLER TO TERMINAL BLOCK ON ENGINE	MINIMUM WIRE SIZE
0' – 25' (7.63m) 25' – 50' [7.62m – 15.24m]	#10 AWG [6 MM²] #8 AWG [10 MM²]

TERMINALS AND TIGHTENING TORQUE		
TERMINAL TYPE	WIRE SIZE	TIGHTENING TORQUE
POWER TERMINALS 45 AMP (G, 1–12)	#14–8 AWG [2.5–10 MM²]	14.2 in–lb [1.6 Nm]
CONTROL AND ALARM TERMINALS (TB2, TB3)	#14–12 AWG [2.5–4 MM²]	5.6 in–lb [.6 Nm]
CONTROL AND ALARM TERMINALS (301–312)	#14–12 AWG [2.5–4 MM²]	7.1 in–lb [.8 Nm]
CIRCUIT BREAKERS	#14–4 AWG [2.5–25 MM²]	17.5 in–lb [2 Nm]







PRESSURE SYSTEM CONNECTION 1/2" FNPT

DESCRIPTION	REV. TO SHEET	ECN NO.	BY	APP.	DATE
REVISED PER FM & NFPA–20 ADD'L ALARM REQUIREMENTS	E	255410	GFD	GFD	6/19/15

PROJECT NAME:	REV. TO SHEET	ECN NO.	BY	APP.	DATE
FIELD CONNECTIONS — FTA1100–J MARK II DIESEL ENGINE FIRE PUMP CONTROLLER – STANDARD FIELD CONNECTIONS					

THIRD ANGLE PROJECTION

	BY	DATE
DRAWN BY	TEF	12/14/02
CHECKED		
PROJECT APPROVAL		
FINAL APPROVAL	TEF	12/14/02

MANUFACTURING TOLERANCES TO BE IN ACCORDANCE WITH ASCO PROCEDURE MP–I–003. FOR PLASTIC PARTS SEE MP–I–055

ASSEM. REF. NO.

COMPUTER GENERATED DRAWING

SCALE 1:1 | SIZE A

DWG. NO. FC1100–20

DRAWING REV. E | ECN NO. 255410 | SHEET 1 OF 1

ASCO® ASCO POWER TECHNOLOGIES, L.P. FLORHAM PARK, NEW JERSEY 07932 U.S.A.

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