

Installation Manual



Automated Fuel Maintenance System

FTI-10A & FTI-20A



FUEL TECHNOLOGIES INTERNATIONAL

Replacement Manuals Available on Website: www.fueltechnologiesinternational.com

Installation Manual

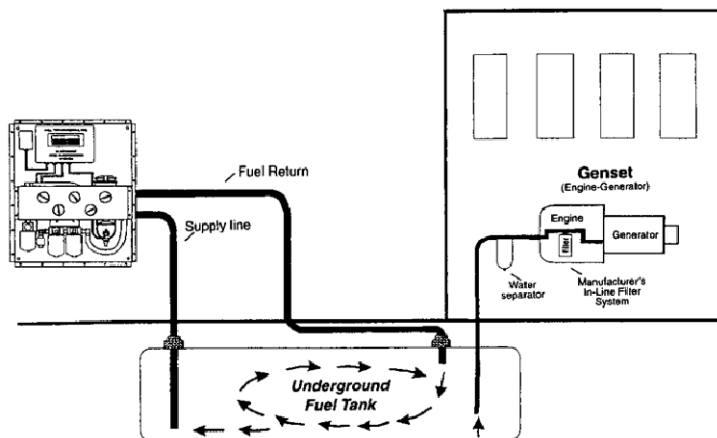
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OVERVIEW

1. The complete automated diesel fuel maintenance system with cabinet shall be designed for wall or pedestal mounting
 - A. The **supply** or suction line shall be installed at the **sump**, or low end of the Diesel Fuel storage tank, with a **Foot Valve**, 1" from the bottom. (not supplied)
 - B. The return line to be installed to the opposite end of the storage tank.
 - C. Caution should be taken **not to exceed the 15-ft. lift** capability of the fuel circulation pump. Should vertical suction lift exceed 15 ft., the circulation pump in the FTI cabinet will be removed.
 - D. The installer will provide & install a submersible pump. The pump voltage must match the FTI control panel voltage as ordered.
 - E. Submersible pump will be wired to the FTI control panel.
(Optional multi-tank submersible pump panel required for more than one tank system)
 - F. A flow control valve and a flow meter will be installed (included) in the FTI cabinet to adjust the flow to 10 or 20 GPM.
(Low Flow will be monitored by the low set point on the pressure switch gauge)
2. Stabilizer to be added to the existing fuel tank, and proportionally when additional fuel is added to the storage tank.
3. Biocide to be added to stored diesel fuel annually.
4. System Inlet Connection - (Model FTI-10A, 1 1/2" NPT) – (Model FTI-20A, 2.0" NPT)
5. System Outlet Connection –(Model FTI-10A, 1 1/2" NPT) – (Model FTI-20A, 1 1/2" NPT)
6. Minimum Suggested Inlet Pipe Size – (Model FTI-10A, 1 1/2" NPT) - (Model FTI-20A, 2.0" NPT)

HOW IT WORKS



INSTALLATION NOTES

1. FTI systems operate on either above ground or underground tanks. Any installation should be completed by a qualified plumbing contractor and qualified electrician.
2. Wall mount or pedestal mount should be bolted into place.
3. 115/208-240V AC, Single Phase, 20 Amp. Power supply must be available at system location.
4. A Disconnect switch is provided on the FTI Control Panel for power shut off.
5. Pipe plugs were installed in the supply and return line for shipping purposes only, and must be removed prior to installation.
6. Holes will need to be added in cabinet for electrical, Fuel supply line, and Fuel return line.
7. All FTI models are factory tested using lightweight oil. Some of this fluid may remain in the system. It will not interfere with the performance of the equipment.
8. On initial start up, if the system does not fill with fluid, the pump may require priming.
(see priming tee location on next page)

INSTALLATION PRECAUTIONS:

IF POWER TO THE FTI CONTROL PANEL IS TO BE TURNED OFF AFTER IT IS INSTALLED, THEN THE INSTALLER SHALL PROVIDE FOR THERMAL EXPANSION PROTECTION.

ALL MANUAL BALL VALVES SHALL REMAIN OPEN. THIS WILL ALLOW FUEL THERMAL EXPANSION TO FLOW BACK TO THE FUEL TANK.

THE FTI CONTROL PANEL WILL AUTOMATICALLY OPEN ALL ELECTRICALLY CONNECTED VALVES WHEN THE FTI PRESSURE SWITCH GAUGE REACHES 45 PSI. THIS WILL OPEN AND CLOSE ALL SUPPLY AND RETURN LINE VALVES CONNECTED TO THE FTI CONTROL PANEL 24/7, ONE TANK AT A TIME.

THIS FEATURE OPERATES AUTOMATICALLY ONLY WHEN POWER IS ON AND THE CONTROL PANEL IS SET TO AUTO MODE OFF OR MANUAL OFF MODES.

FTI WILL NOT BE RESPONSIBLE FOR ANY THERMAL EXPANSION DAMAGE DUE TO EXCESSIVE PRESSURE.

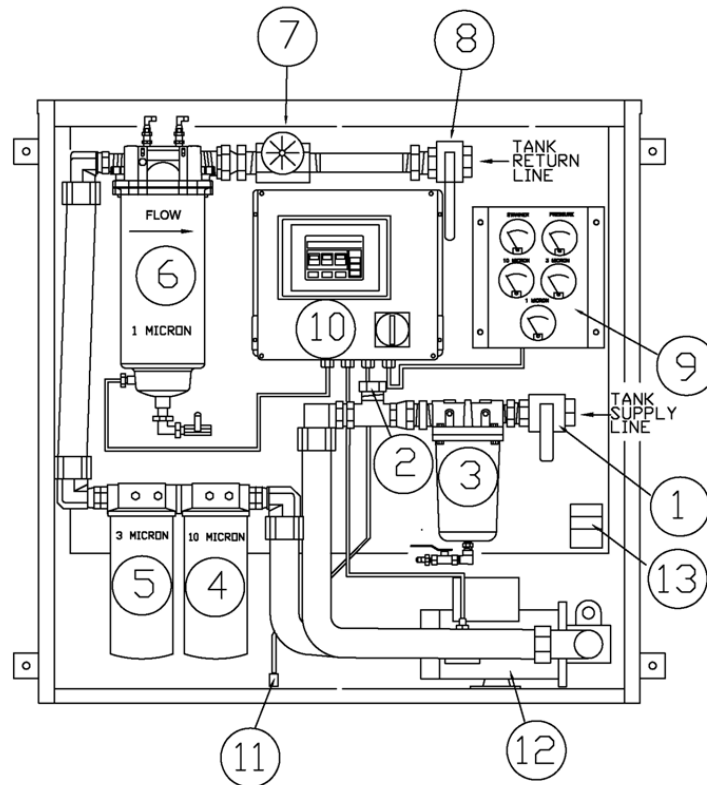
DO NOT RUN LONGER THAN THREE MINUTES WITHOUT FLUIDS

To *prime the pump, close the supply line ball valve and fill with fuel at the priming tee.* Remove the Priming Tee Cap and fill. Restart the system.

For starting system see operations manual.

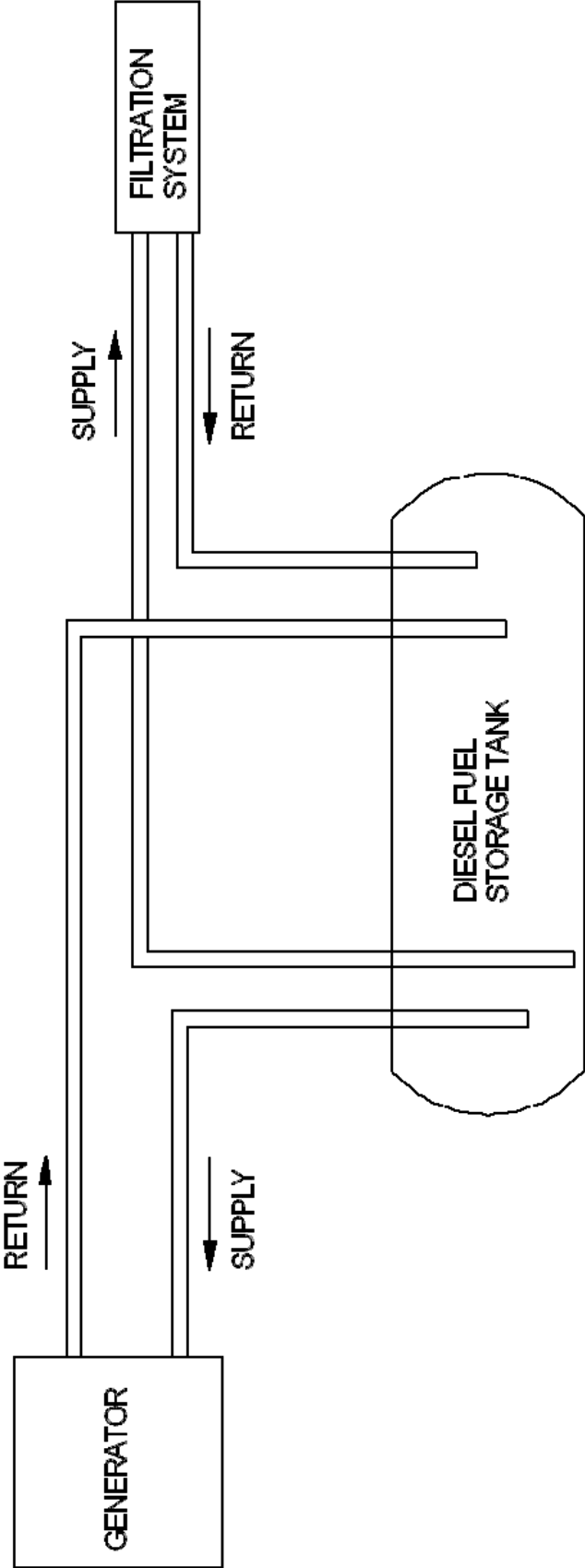
IDENTIFYING PARTS

FTI-10A & FTI-20A



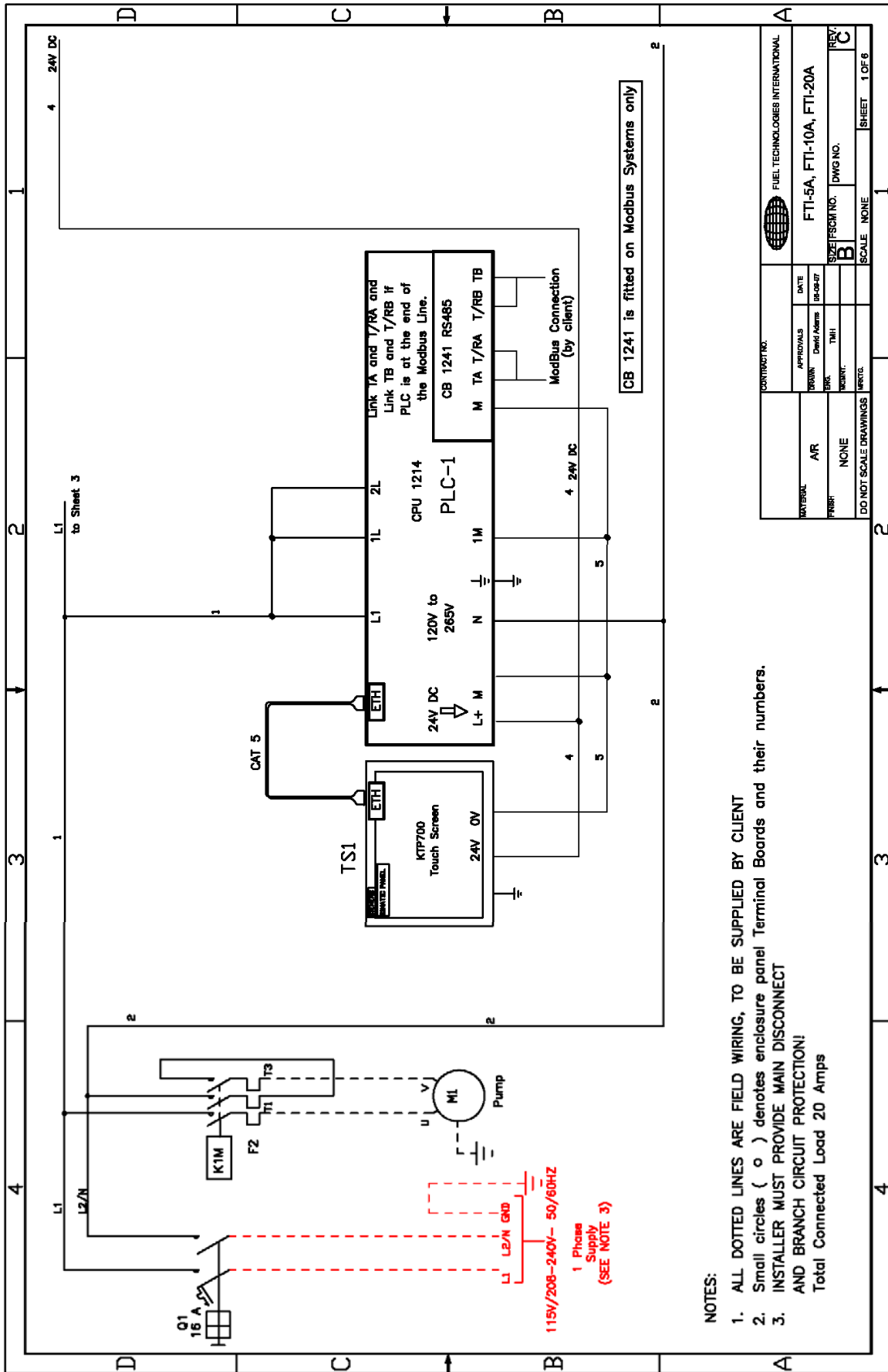
- 1) Supply Line Connection, SS Ball Valve, (Model 10A, 1 1/2" NPT), (Model 20A, 2.0" NPT)
- 2) Priming Tee (Remove Cap and fill with Fuel if needed)
- 3) Strainer – Cartridge Type with 100 Mesh, 149 Micron Element
- 4) 10 Micron Pre Filter, Spin On Type
- 5) 3 Micron Pre Filter, Spin On Type
- 6) 1 Micron element and Water Separator
- 7) Site Glass
- 8) Return Line Connection, SS Ball Valve (Model 10A, 1 1/2" NPT), (Model 20A, 1 1/2" NPT)
- 9) Switch Gauge Panel
- 10) UL Listed Control Panel
- 11) Leak Detector
- 12) Pump / Motor Assembly
- 13) Serial Number, Model Number, FM Approved Tags

PREFERRED STAND ALONE INSTALLATION



Notes:

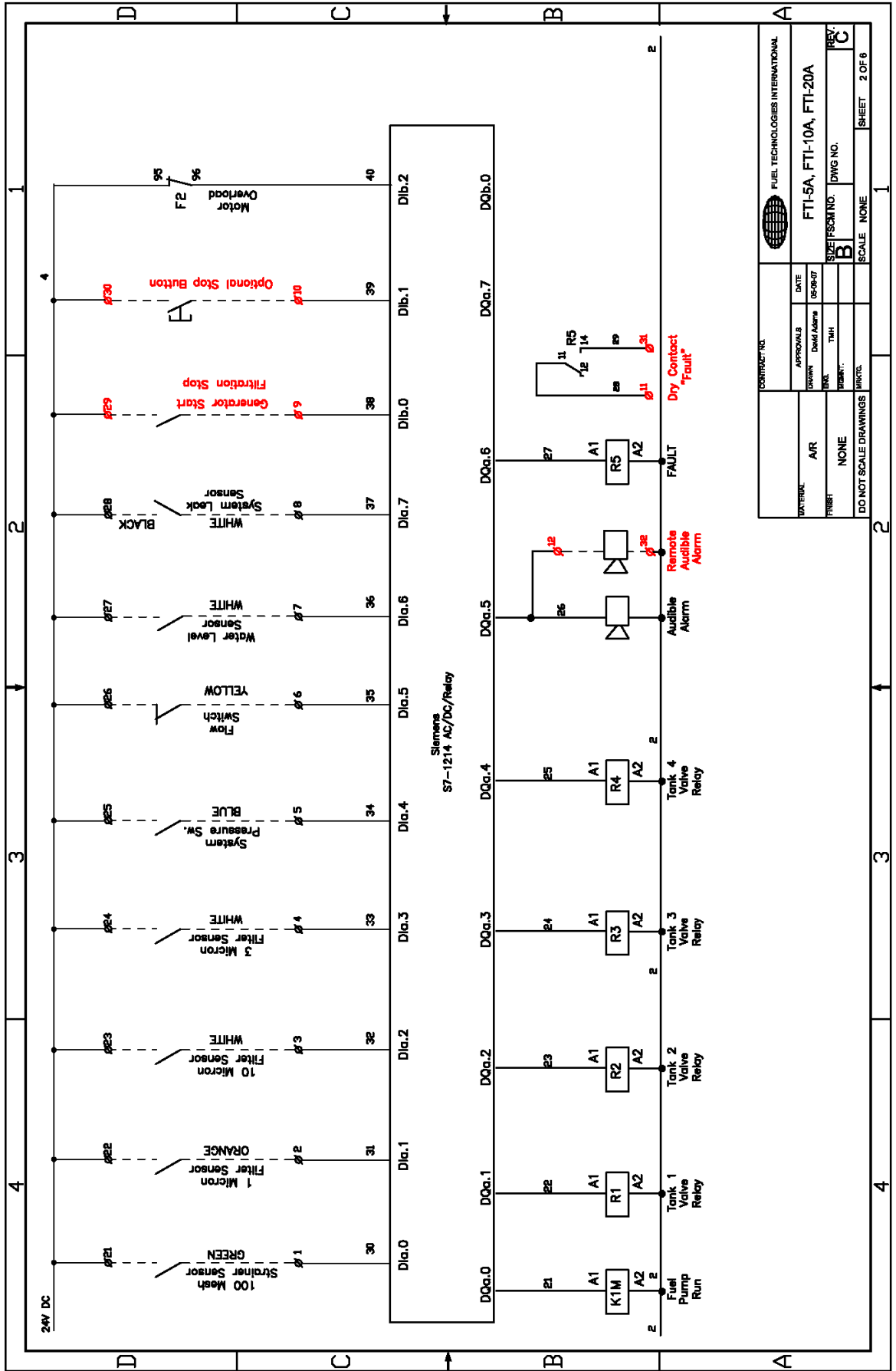
- FTI supply line should be installed 1" from bottom of storage tank, at sump end.
- A foot valve must be installed on supply line to keep system primed.



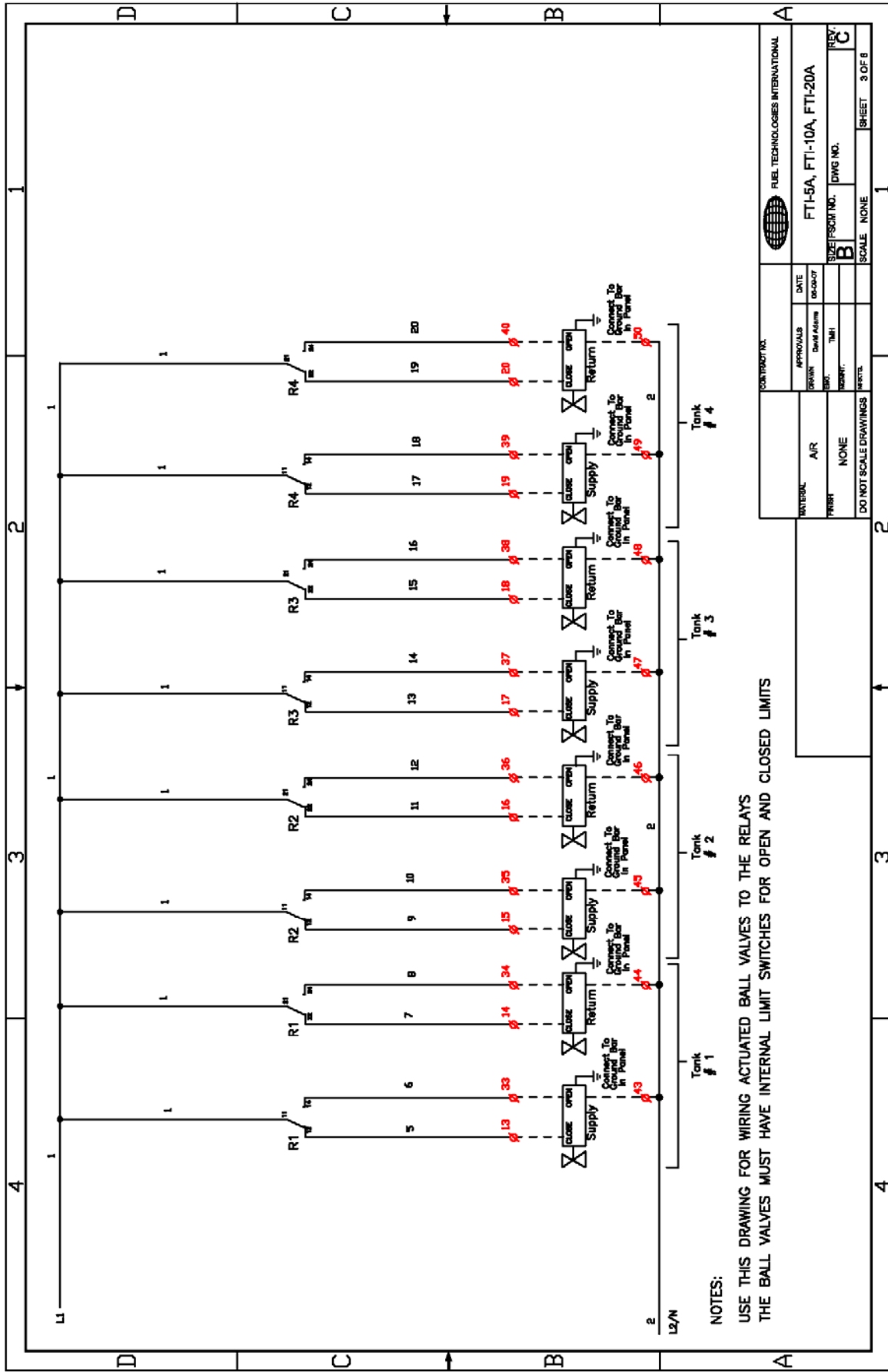
NOTES:

1. ALL DOTTED LINES ARE FIELD WIRING, TO BE SUPPLIED BY CLIENT
2. Small circles (o) denotes enclosure panel Terminal Boards and their numbers.
3. INSTALLER MUST PROVIDE MAIN DISCONNECT AND BRANCH CIRCUIT PROTECTION!
Total Connected Load 20 Amps

| | | | |
|-----------------------|----------------|---------------------------------|---------------|
| CONTRACT NO. | | FUEL TECHNOLOGIES INTERNATIONAL | |
| APPROVALS | DATE | FTI-5A, FTI-10A, FTI-20A | |
| DESIGNER: David Adams | DATE: 08-04-07 | SIZE: FSCM NO. | DWG NO. |
| CHKD: | TMH | B | REV. C |
| PRPDR: | NONE | SCALE: NONE | SHEET: 1 OF 6 |
| DO NOT SCALE DRAWINGS | | | |



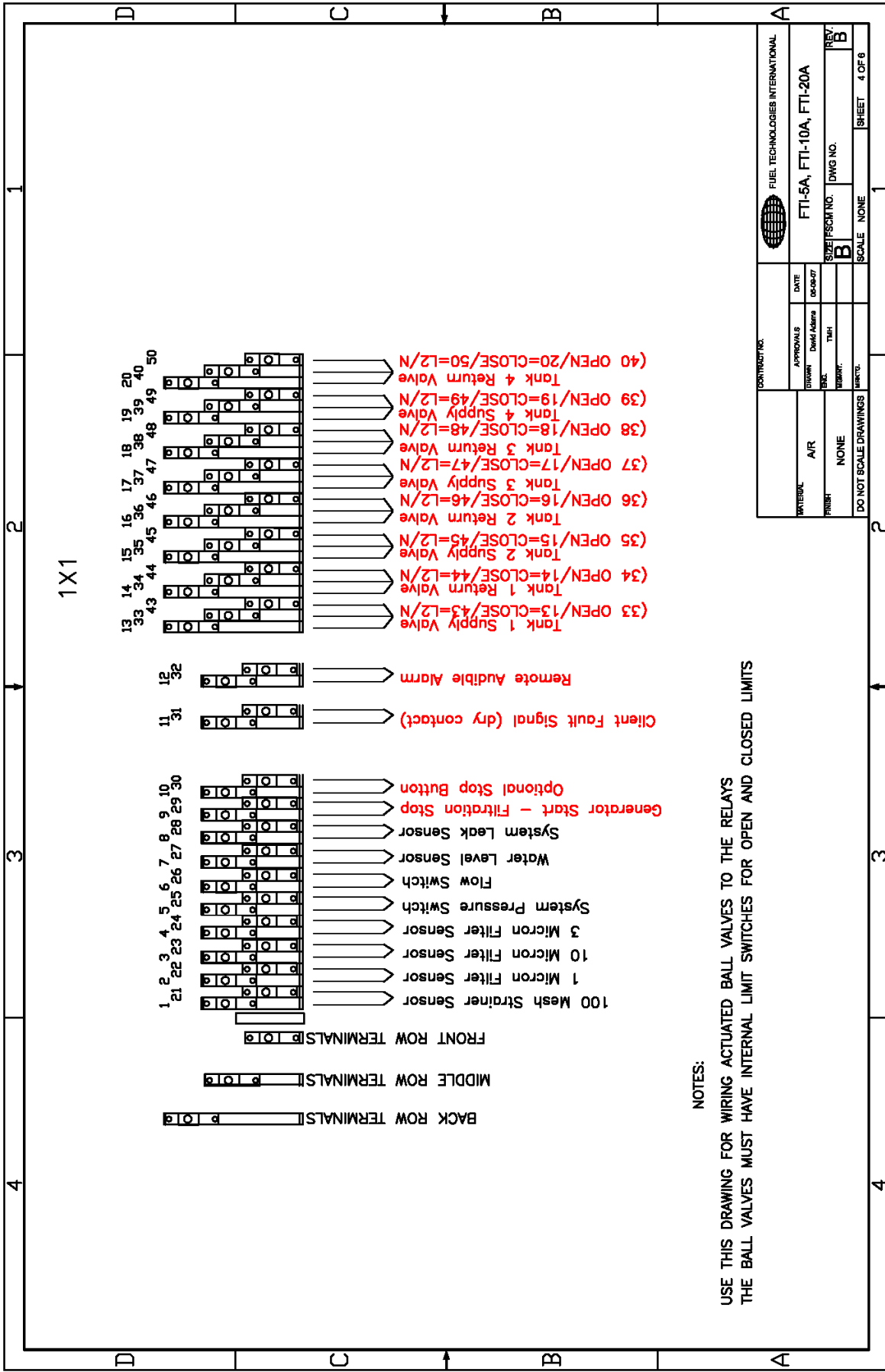
| | |
|---------------------------------|---------------------------------------|
| FUEL TECHNOLOGIES INTERNATIONAL | |
| DATE: 02-08-07 | REV: C |
| DRAWN: David Adams | SIZE/FSC/NO: FTI-5A, FTI-10A, FTI-20A |
| TRK: TRH | DWG NO.: |
| QUANT: 1 | SCALE: NONE |
| DO NOT SCALE DRAWINGS | |
| SHEET 2 OF 8 | |



NOTES:

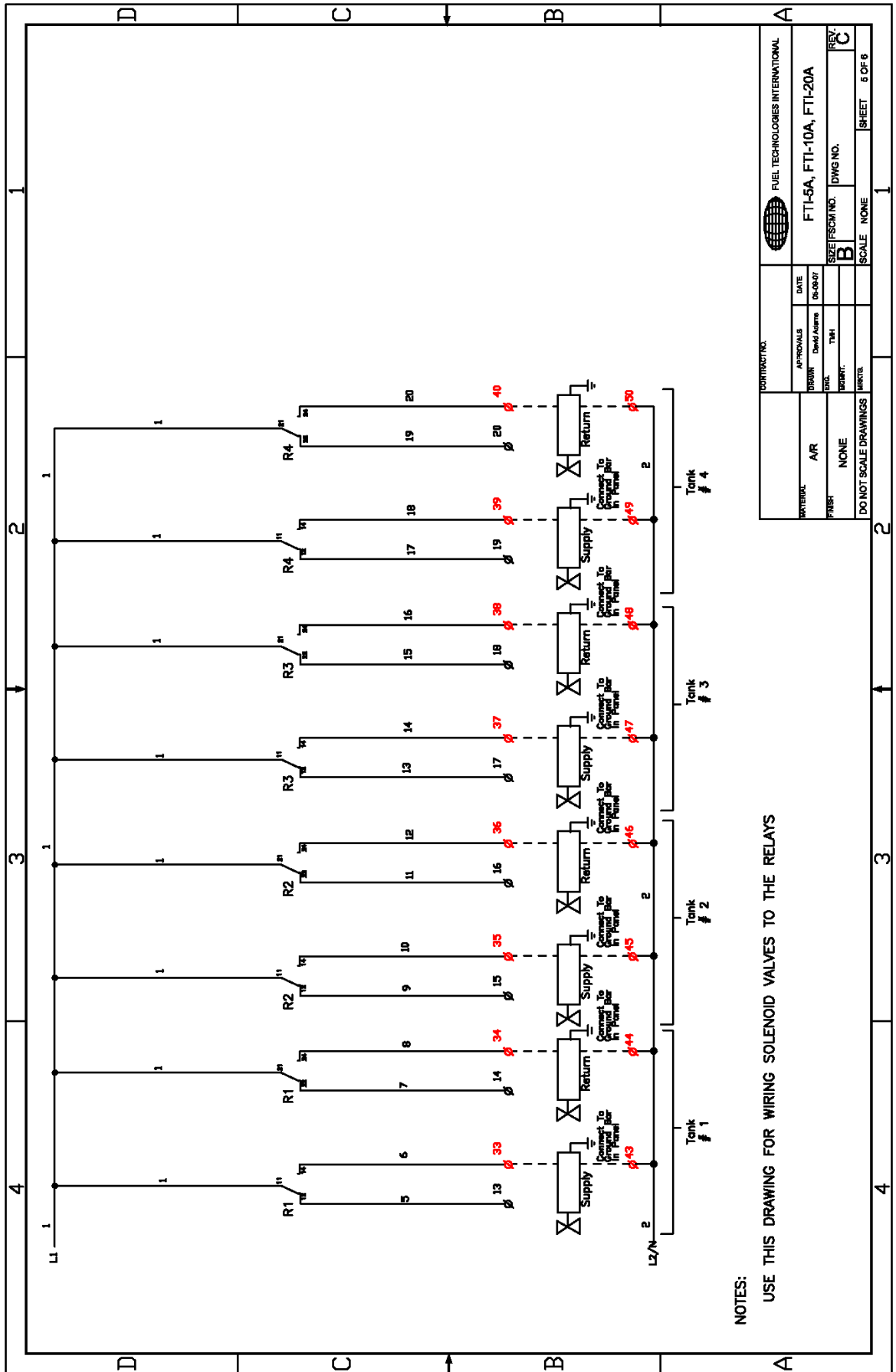
USE THIS DRAWING FOR WIRING ACTUATED BALL VALVES TO THE RELAYS
 THE BALL VALVES MUST HAVE INTERNAL LIMIT SWITCHES FOR OPEN AND CLOSED LIMITS

| | | | | | |
|---------------------------------|--|-------------|--|---------|--|
| CONTRACT NO. | | APPROVALS | | DATE | |
| MATERIAL | | DRAWN | | CHECKED | |
| FUEL TECHNOLOGIES INTERNATIONAL | | David Adams | | | |
| FTI-5A, FTI-10A, FTI-20A | | T.M.H. | | | |
| SIZE / FSCM NO. | | REV. | | DWG NO. | |
| B | | C | | C | |
| DO NOT SCALE DRAWINGS | | SCALE | | SHEET | |
| NONE | | NONE | | 3 OF 8 | |



NOTES:
 USE THIS DRAWING FOR WIRING ACTUATED BALL VALVES TO THE RELAYS
 THE BALL VALVES MUST HAVE INTERNAL LIMIT SWITCHES FOR OPEN AND CLOSED LIMITS

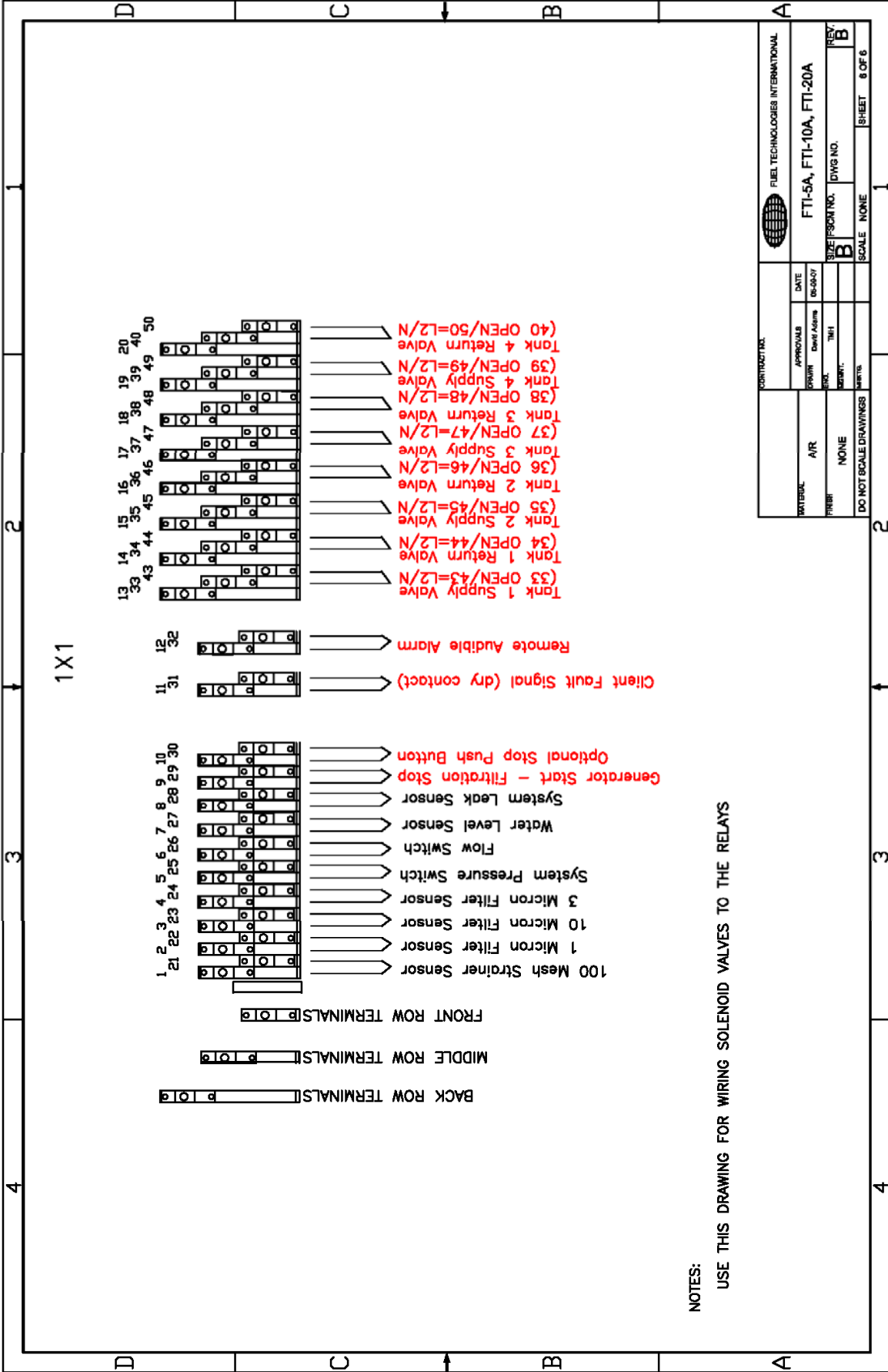
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| CONTRACT NO. | | FUEL TECHNOLOGIES INTERNATIONAL | |
| APPROVALS | DATE | FTI-5A, FTI-10A, FTI-20A | |
| DESIGNER: David Adams | 06-06-07 | SIZE/FSCM NO. | DWG NO. |
| ENCL. | TMR | B | |
| REVISION | | SCALE | NONE |
| DO NOT SCALE DRAWINGS | DATE | | SHEET 4 OF 6 |



NOTES:

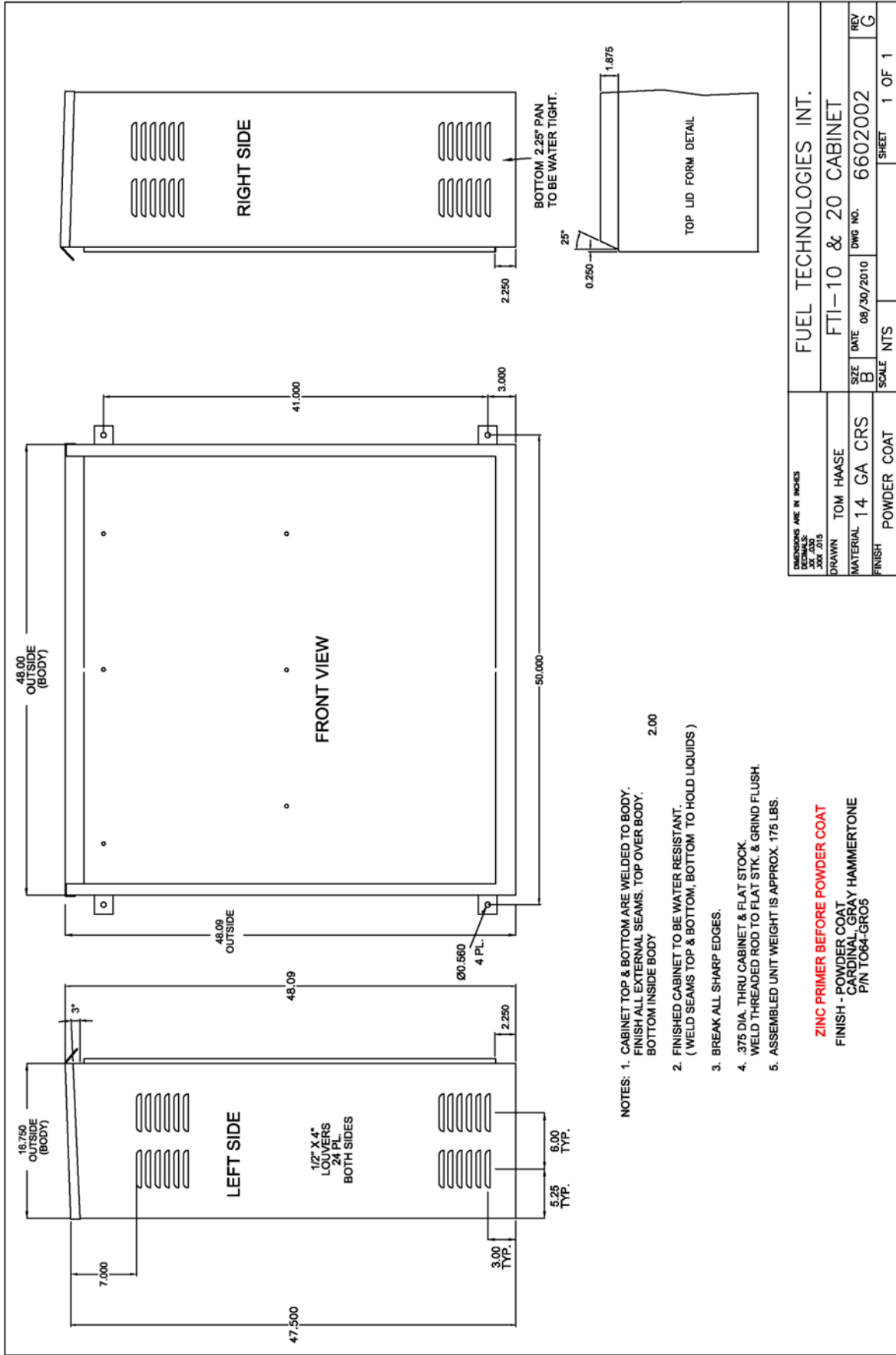
USE THIS DRAWING FOR WIRING SOLENOID VALVES TO THE RELAYS

| | | | |
|-----------------------|-------------|---------------------------------|----------|
| CONTRACTOR: | | FUEL TECHNOLOGIES INTERNATIONAL | |
| MATERIAL: | A/R | DATE: | 06-09-07 |
| DESIGNER: | David Adams | DRAWN: | THM |
| DATE: | | SCALE: | NONE |
| PROJECT: | NONE | DWG NO.: | |
| DO NOT SCALE DRAWINGS | | SHEET: | 5 OF 6 |



NOTES:
USE THIS DRAWING FOR WIRING SOLENOID VALVES TO THE RELAYS

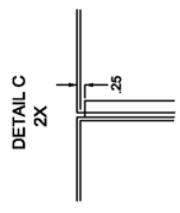
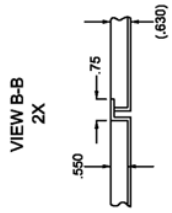
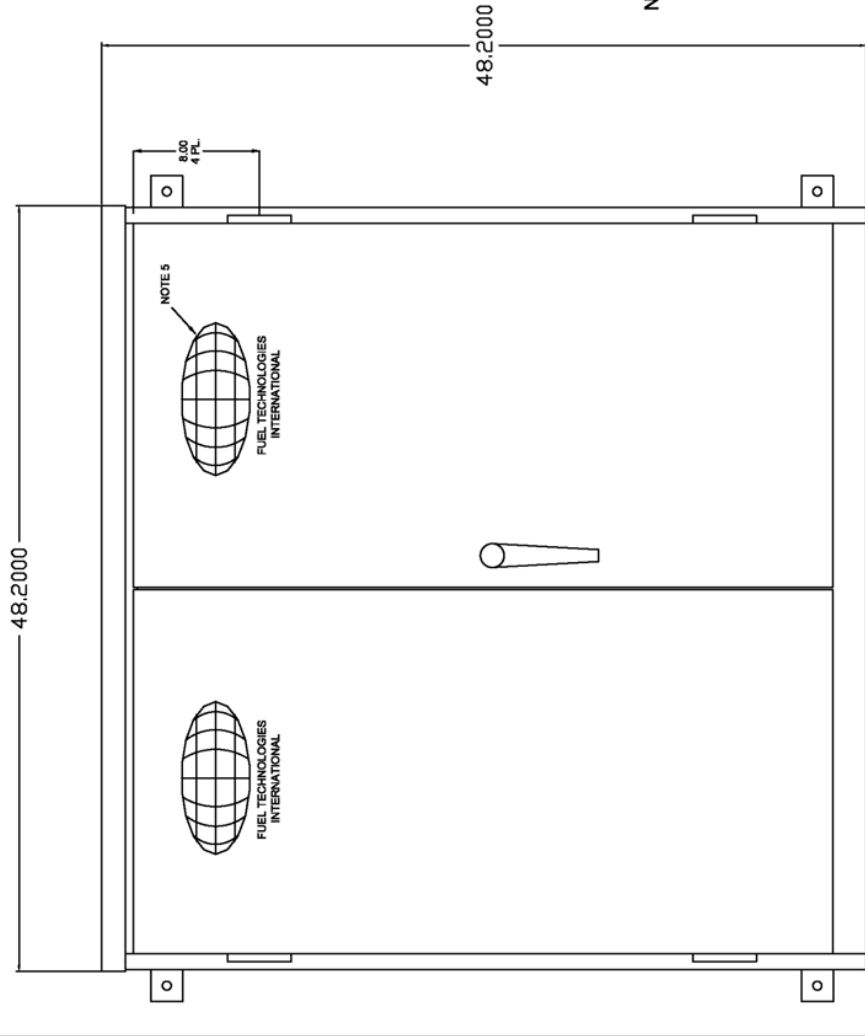
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| CONTRACTOR NO. | | FUEL TECHNOLOGIES INTERNATIONAL | |
| MATERIAL | APPROVALS | DATE | REV. |
| ATR | DESIGN | 08-06-07 | B |
| PREP | DATE ADDED | | |
| | NO. | TRH | |
| | SECRET | | |
| DO NOT SCALE DRAWINGS | | SCALE | SHEET 6 OF 6 |
| | | NONE | |



- NOTES: 1. CABINET TOP & BOTTOM ARE WELDED TO BODY. FINISH ALL EXTERNAL SEAMS. TOP OVER BODY. BOTTOM INSIDE BODY. 2.00
2. FINISHED CABINET TO BE WATER RESISTANT. (WELD SEAMS TOP & BOTTOM, BOTTOM TO HOLD LIQUIDS)
3. BREAK ALL SHARP EDGES.
4. .375 DIA. THRU CABINET & FLAT STOCK. WELD THREADED ROD TO FLAT STK. & GRIND FLUSH.
5. ASSEMBLED UNIT WEIGHT IS APPROX. 175 LBS.

ZINC PRIMER BEFORE POWDER COAT
 FINISH - POWDER COAT
 CARDINAL GRAY HAMMERTONE
 P/N T064-GRO5

| | | | |
|--|-------------|------------------------|------------|
| DIMENSIONS ARE IN INCHES DECIMALS TOLERANCES UNLESS NOTED | | FUEL TECHNOLOGIES INT. | |
| DRAWN | TOM HAASE | FTI-10 & 20 CABINET | |
| MATERIAL | 14 GA CRS | SIZE | B |
| FINISH | POWDER COAT | DATE | 08/30/2010 |
| | | DWG NO. | 6602002 |
| | | SCALE | NTS |
| | | SHEET | 1 OF 1 |
| | | REV | C |



- NOTES:
- 1 FABRICATE 14 GA. CRS DOORS PER DETAILS. INSIDE DIMS. TO CLEAR CAB. LIP .06/SIDE. APPLY WEATHERSTRIP 7 PL. AFTER FINISH.
 - 2 HANDLE - STAINLESS, 3 POINT LATCH, PADDLE LOCKABLE
 - 3 HINGES - STAINLESS, SCREW ON, LIFT OFF
 - 4 FINISH - POWDER COAT
CARDINAL, GRAY HAMMERTONE
P/N T064-GR05
ZINC PRIMER BEFORE POWDERCOAT
 - 5 SILKSCREEN 2 PL.

| | | | |
|--|--|------------------------|-----------------|
| DIMENSIONS ARE IN INCHES DECIMALS XXX.XXX DRAWN TOM HAASE | | FUEL TECHNOLOGIES INT. | |
| MATERIAL 14 GA CRS | | SIZE B | DATE 03/14/2011 |
| FINISH POWDER COAT | | DWG NO. 6602002 | REV C |
| SCALE NTS | | SHEET 2 OF 2 | |

FTI AUTOMATED FILTRATION SYSTEM START-UP PROCEDURE

Technician _____ Observer _____

1. System to be tested

A. FTI Automated Filtration System – Model **(FTI-5A)** (FTI-10A) (FTI-20A) **(circle one)**

2. FTI Filtration System Start-up Procedure

A. Program system to automatically filter for 1 hour. Reset clock to within 1-5 minutes of start time (See Operations Manual for Instructions) Place the Control Panel in AUTO mode. Wait for filtration to start.

- 1.) Check MOTOR / PUMP RUNNING status.
- 2.) Check SOLENOID VALVES open status.
- 3.) Check ELECTRIC BALL VALVES open status

Notes: _____

B. Place the control panel in MANUAL mode.

Start manual filtration. (See Operations Manual for Instructions)

- 1.) Check MOTOR / PUMP RUNNING status.
- 2.) Check SOLENOID VALVE open status.
- 3.) Check ELECTRIC BALL VALVE open status.

Notes: _____

C. Simulate a strainer HIGH VACUUM ALARM at the strainer ball valve.

Slowly close supply line ball valve until the needle at Strainer/Vacuum Gauge contacts set point and alarm sounds.

- 1.) Check strainer high vacuum alarm. (16-18 in hg)

Notes: _____

D. Simulate a 10 MICRON HIGH DIFFERENTIAL pressure at the Switch Gauge Panel.

With system running in manual mode, use a 1/16" hex wrench and move the 10 Micron Switch Gauge contact to the left until needle contacts it, alarm will sound).

Replace contact set point where it was. (16-18 psi.)

- 1.) Check 10 micron high differential pressure alarm.

Notes: _____

E. Simulate a 3 MICRON HIGH DIFFERENTIAL pressure at the Switch Gauge Panel.

With system running in manual mode, use a 1/16" hex wrench and move the 3 Micron Switch Gauge contact to the left until needle contacts it, alarm will sound.

Replace contact set point where it was. (16-18 psi.)

- 1.) Check 3 micron high differential pressure alarm.

Notes: _____

*F. Simulate a 1 MICRON & COALESCER HIGH DIFFERENTIAL pressure at the Switch Gauge Panel. With system running in manual mode, use a 1/16" hex wrench and move the 1 Micron Switch Gauge contact to the left until needle contacts it, alarm will sound.
Replace contact set point where it was. (16-18 psi.)*

- 1.) Check 1 micron & Coalescer high differential pressure alarm.

Notes: _____

*G. Simulate a HIGH PRESSURE ALARM at the outlet ball valve. With system running in manual mode, slowly close tank return line ball valve to simulate blockage.
When the Pressure Switch Gauge needle touches contact @ 45 psi, alarm will sound.*

- 1.) Check high pressure alarm.

Notes: _____

*H. Simulate a LEAK in cabinet. Lift leak detector. Alarm will sound.
Reset control panel.*

- 1.) Check leak alarm.

Notes: _____

I. Simulate a GENERATOR RUNNING action. With system running short across terminals #9 & #29 inside control panel with a jumper wire. This will turn off pump and read Generator running on the screen.

- 1.) Check pump shut off and proper description on the touch screen.

Notes: _____

J. Simulate MOTOR OVERLOAD. With system running push the red test button on the motor overload inside control panel.

- 1.) Check motor is stopped and correct alarm description on the touch screen.

Notes: _____

K. Simulate LOSS OF PRIME (low flow). Change low flow to 1 minute (see Operations Manual). With system running short across terminals #6 & #26 inside Control Panel with a jumper wire for 1 minute. Alarm will sound with loss of prime shown on the screen.

- 1.) Check low flow alarm.

Notes: _____

L. Simulate WATER FULL in the collection bowl. Remove water sensor cable from 1 Micron Filter Housing. Short with wire between the 2 pins.

- 1.) Check Water alarm

Notes: _____

TEST COMPLETE