



# COUGAR★USA

The Lone Star in Water Control

## Storage Tank Level & Alarm Control System Bills of Materials

### LEVEL ALARM CONTROL PANEL

1 – Cougar Controls Custom Level Control and Alarm Panel with the following Features and Bills of Materials:

- 24” x 20” x 8” Type 4 Steel Enclosure
- 7AMP 120V Circuit Breaker
- PLC Control Panel Mount Digital Display/Touch Screen
  - Digital Readout
    - High Level & Low Level Alarm Indication
    - Back-Up High Level Alarm
    - Domestic Level Display
    - Fire Level Display
  - Touch Screen Function
    - Level Alarm Set-points
    - Fill Valve Operation Set-points
    - Alarm Silencing
    - Alarm buzzer
    - General Alarm LED beacon

### Domestic Tank

- High level audible and visual alarm
- Low level audible and visual alarm
- High Level Block Valve HOA Control
- Duplex Solenoid valve fill circuit with separate valve open and close levels
- Two HOA Switches and Green Solenoid valve on lights
- “Form C”, SPDT, Low Level Pump Cut-Off Contacts
- High level & Low Level Auxiliary alarm contacts for remote indication of alarm condition

*Continued.....*

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### **Fire Tank**

- High level audible and visual alarm
- Low level audible and visual alarm
- High Level Block Valve HOA Control
- Duplex Solenoid valve fill circuit with separate valve open and close levels
- Two HOA Switches and Green Solenoid valve on lights
- High level & Low Level Auxiliary alarm contacts for remote indication of alarm condition

### **LEVEL SENSORS – 3” Flange Required per Compartment**

- 2 - Cougar Controls Level Control Sensor Assembly. Provide one 3” 150# flange Tank opening for each compartment, total of [ 2 ] sensors. Sensor assembly consists of a Type 4X Polycarbonate Junction Box, ¾” SS Conduit connections and 3” Sch. 80 150# PVC Flange. The Level control devices consist of:
  - a. Submersible Pressure Transmitter: Prosense Series SLT1 continuous pressure sensor, Stainless Steel material.
  - b. High Level Backup Probes – Similar to Warrick 3W2 stainless steel wire suspended electrodes. Provide three electrodes; one for High Level Indication, one for High Level Reset, and one for Ground Reference.

# ENGINEERING SPECIFICATION

## 1.10 General

- A. Specifications for a model ET13F4B2T1 Level Control Panel as manufactured by Cougar Controls, a business unit of Cougar Systems, LLC. Houston, TX, or approved equal. The contractor shall furnish and install the ET13 Series Level Control Panel as specified herein.
- B. Incoming pump power shall be Single Phase, 60 Hz, 115/120 VAC (Specify site voltage).

## 2.10 Certification

- A. The panel shall be built by a UL 508A approved control systems manufacturer (Cougar Controls, a business unit of Cougar Systems, LLC or approved equal) and 100% tested at the factory prior to shipping.
- B. Panels containing intrinsically safe circuits shall be built by a UL 698A approved control systems manufacturer (Cougar Controls, a business unit of Cougar Systems, LLC or approved equal) and 100% tested at the factory prior to shipping.

## 3.10 Warranty

- A. The Single Phase Level Control Panel shall be warranted in writing against defects in materials and workmanship under normal use and service for a period of three (3) years from the date of shipment when installed and used in accordance with the manufacturer recommendations.

## 4.10 Construction

- A. The enclosure shall be at a minimum Type 4X rated with lockable latches approved for indoor and outdoor environments.
- B. LED Red Day light visible, flashing alarm beacon, mounted on the top of the enclosure
- C. Alarm Buzzer
- D. For Outdoor applications the enclosure shall have dead-front swing panel construction.
- E. UL489 Single Pole Main Disconnect, 7 amp
- F. (2) Conductivity Critical High Level Relay
  - Redundant relay operation protects against PLC or sensor failure system upset.
- G. The front panel indicators shall include:
  1. (4) Fill Valve 3-position selector switch, Open-Close-Auto, Green illuminated LED.
    - 120vac power to open
    - Solenoid operation
  2. (2) Block Valve 3-position selector switch, Close-Open-Auto, Red illuminated LED.
    - 120vac power to close
    - 120vac power to open
    - L1 and neutral for enclosure heater
    - Motor operated Valve
  3. (1) Domestic Back-up High Level Alarm Red LED Indicator
  4. (1) Fire Back-up High Level Alarm RED Indicator
  5. LED backlit Digital Touchscreen
- H. Touchscreen HMI functions as follows:
  1. Lead Fill Valve Selection
  2. Alarm Silence Button
  3. "High Level Alarm" Indication
  4. "Low Level Alarm" Indication
  5. Continuous Level Readout, in inches. (other scales available upon request)

6. Level Settings including:
  - Level sensor span
  - Level Read-out offset
  - Level Display refresh rate
  - Alarm reset differential
  - Alarm on-delay timer, seconds (range 0-9999)
  - High Level Alarm set point
  - Low Level Alarm set point
  - Fill Valve(s) close
  - Fill Valve Lead open
  - Fill Valve Lag open
  
- I. The panel shall be equipped with a remote monitoring dry contact for General Alarm. The General alarm contact shall be normally closed to indicate a power failure or loss of system control.
- J. (2) BAS Dry contact for High Level Alarm
- K. (2) BAS Dry contact for Low Level Alarm
  1. All field terminations located in one location, segregated by voltage.
  2. Adjacent labeling, sensors, BAS interface, incoming power, valve wiring.
- L. Heat shrink wire markers with circuit voltage indication
- M. Supply one set of Spare fuses
- N. Panel nameplate shall be permanently affixed inside the enclosure displaying panel model number, serial number, voltage, phase, and SCCR ratings. There shall be a schematic drawing located on the inside the enclosure for field personnel.
- O. Control panel shall be a ET13F4B2T1 as manufactured by Cougar Controls, a business unit of Cougar Systems, LLC., Houston, TX, or approved equal.



**COUGAR★SYSTEMS**

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# Combination Storage Tank Level & Alarm Control System Sequence of Operation

## Domestic Tank

### *High Level Alarm*

Should the level in the tank rise to the set point, the following panel functions will occur:

- Alarm buzzer will sound
- Digital Display “Domestic High Level” & General Alarm Light will be illuminated
- Block Valve Pilot Solenoid will be energized, closing the block valve
- Remote High Level Alarm Contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the general alarm beacon and high level alarm light will remain illuminated, the block valve solenoid will remain energized and the remote alarm contact will remain closed until the level in the tank has receded below the set point.

### *Back-Up High Level Alarm*

Should the level in the tank rise to the *Back-Up High Level Probe*, the following panel functions will occur:

- Alarm buzzer will sound
- Digital Display “Domestic Critical High Level” & General Alarm Light will be illuminated
- Block Valve Pilot Solenoid will be energized, closing the block valve
- Remote High Level Alarm Contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the general alarm beacon and high level alarm light will remain illuminated, the block valve solenoid will remain energized, and the remote alarm contact will remain closed until the level in the tank has receded below the *Back-Up High Level Reset Probe*.

*CONTINUED.....*

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### ***Low Level Alarm***

Should the level in the tank recede below the set point, the panel functions will occur:

- Alarm buzzer will sound
- Digital Display “Domestic Low Level” & General Alarm Light will be illuminated
- Pump cut-off normally open contact will close
- Pump cut-off normally closed contact will open
- Low level remote alarm contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the low level alarm light will remain illuminated, pump cut-off contacts will remain closed/opened, and the low level remote alarm contact will remain closed until the level in the tank has risen to the set point.

### ***Fill Valve Operation***

Should the level in the tank recede below the set point, the following panel functions will occur:

- The Fill Valve #1 Pilot Solenoid circuit will be Energized
- The Fill Valve #1 Green On Light Will Be Illuminated. The lead fill valve will remain open until the level in the tank rises to the off set point.

Should the level in the tank recede below the set point, the following panel functions will occur:

- The Fill Valve #2 Pilot Solenoid circuit will be Energized
- The Fill Valve #2 Green On Light Will Be Illuminated. The lag fill valve will remain open until the level in the tank rises to the off set point.

## **Fire Tank**

### ***High Level Alarm***

Should the level in the tank rise to the set point, the following panel functions will occur:

- Alarm buzzer will sound
- Digital Display “Domestic High Level” & General Alarm Light will be illuminated
- Block Valve Pilot Solenoid will be energized, closing the block valve
- Remote High Level Alarm Contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the general alarm beacon and high level alarm light will remain illuminated, the block valve solenoid will remain energized and the remote alarm contact will remain closed until the level in the tank has receded below the set point.

### ***Back-Up High Level Alarm***

Should the level in the tank rise to the *Back-Up High Level Probe*, the following panel functions will occur:

- Alarm buzzer will sound
- Digital Display “Domestic Critical High Level” & General Alarm Light will be illuminated

- Block Valve Pilot Solenoid will be energized, closing the block valve
- Remote High Level Alarm Contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the general alarm beacon and high level alarm light will remain illuminated, the block valve solenoid will remain energized, and the remote alarm contact will remain closed until the level in the tank has receded below the *Back-Up High Level Reset Probe*.

### ***Low Level Alarm***

Should the level in the tank recede below the set point, the panel functions will occur:

- Alarm buzzer will sound
- Digital Display “Fire Low Level” & General Alarm Light will be illuminated
- Low level remote alarm contact will close

The alarm buzzer can be silenced by momentarily depressing the silencing pushbutton, however, the low level alarm light will remain illuminated, and the low level remote alarm contact will remain closed until the level in the tank has risen to the set point.

### ***Fill Valve Operation***

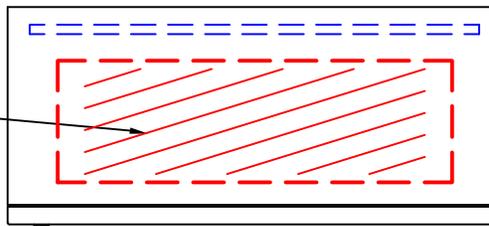
Should the level in the tank recede below the set point, the following panel functions will occur:

- The Fill Valve #1 Pilot Solenoid circuit will be Energized
- The Fill Valve #1 Green On Light Will Be Illuminated. The lead fill valve will remain open until the level in the tank rises to the off set point.

Should the level in the tank recede below the set point, the following panel functions will occur:

- The Fill Valve #2 Pilot Solenoid circuit will be Energized
- The Fill Valve #2 Green On Light Will Be Illuminated. The lag fill valve will remain open until the level in the tank rises to the off set point.

NO FIELD PENETRATIONS

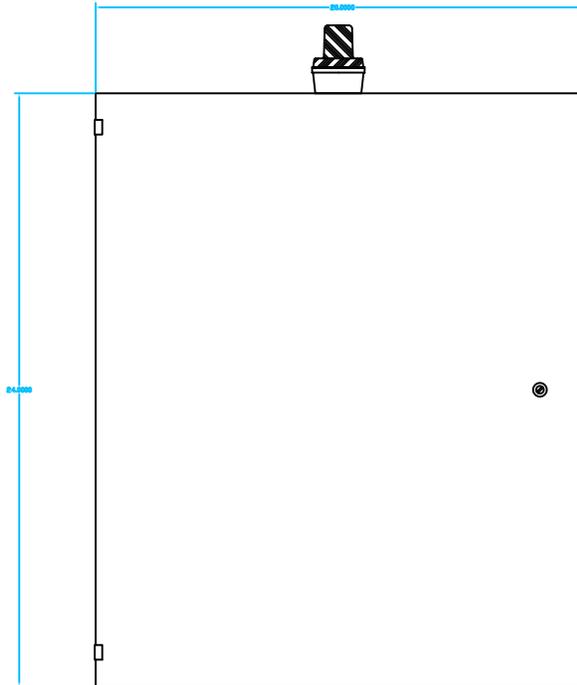
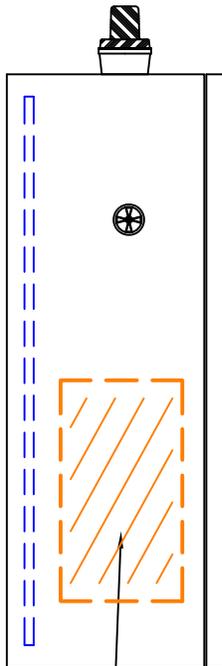


TOP

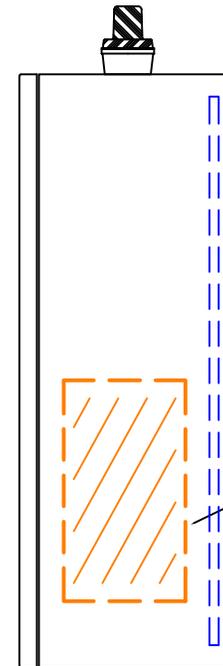
\*\*\* URGENT \*\*\*

ANY FIELD PENETRATIONS IN LOCATIONS OTHER THEN FACTORY AUTHORIZED AREAS WILL **VOID MANUFACTURERS WARRANTY** OF ALL INTERNAL COMPONENTS.

LEFT

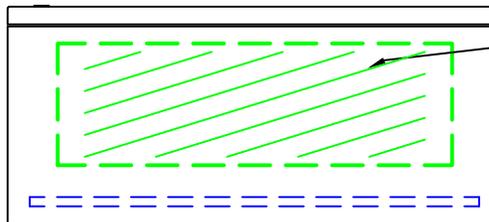


RIGHT



ALTERNATE FIELD PENETRATIONS

ALTERNATE FIELD PENETRATIONS



BOTTOM

PREFERRED FIELD PENETRATION LOCATIONS

**REVISIONS**

REV.	DESCRIPTION	BY	DATE

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Project:

DRAWING DESC.

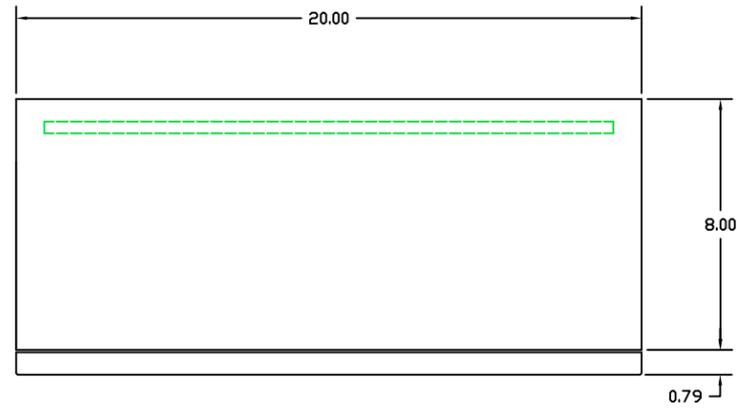
**FIELD PENETRATION**

CUSTOMER:

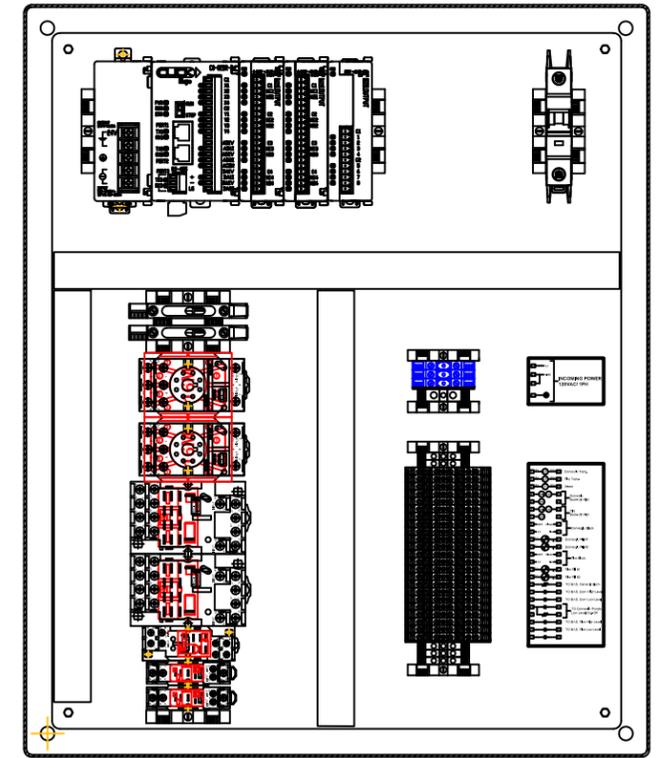
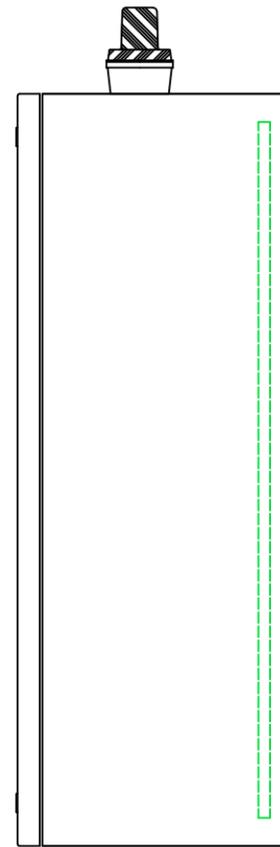
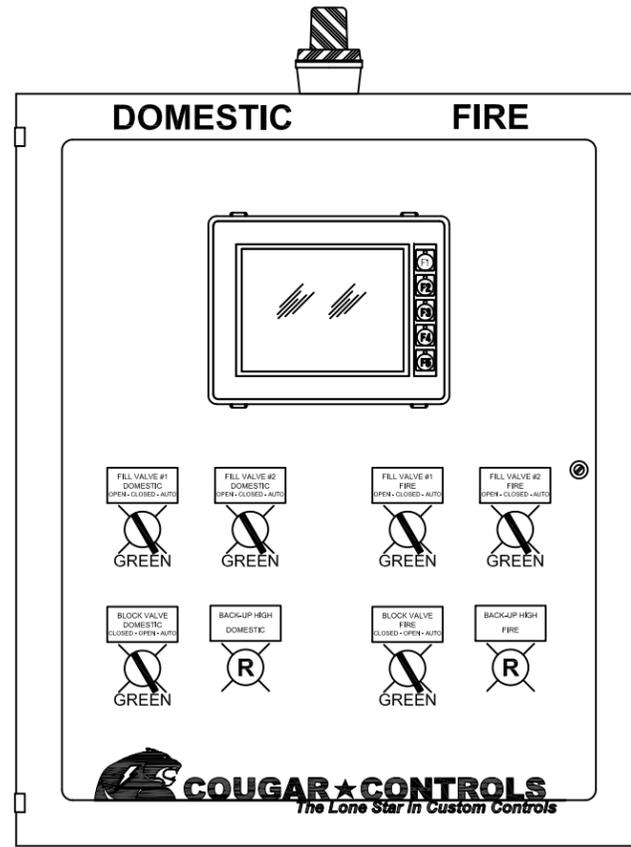
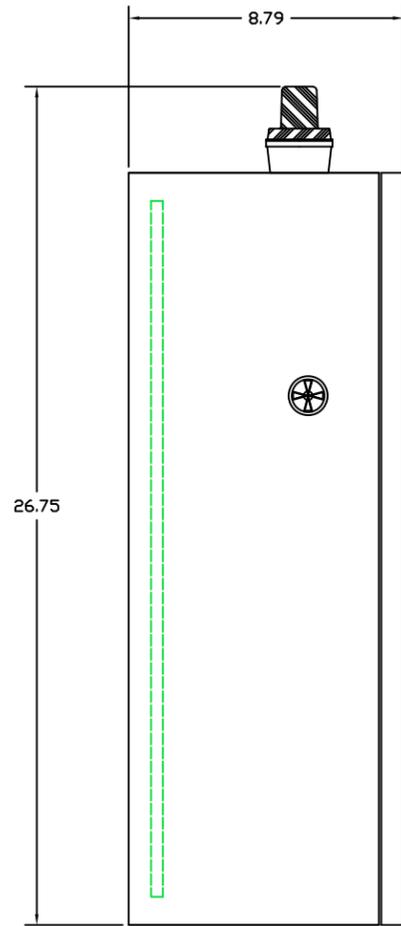
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DWG. NO.:

DATE:



24" X 20" X 10" TYPE 4X ENCLOSURE



**REVISIONS**

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Project:

DRAWING DESC.

**ENCLOSURE DETAIL**

CUSTOMER:

DRAWN BY:  
AP

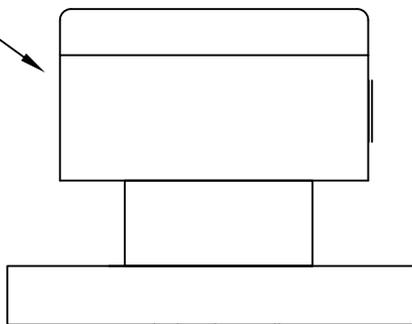
DWG. NO.:  
ET13F4B2T1

DATE:  
10-8-19





5" Type 4X Polycarbonate



3" 150# Van-Stone Flange

Suspension Wire

Probe #1  
Critical High Level  
S.S. Electrode

Probe #2  
Critical High Reset  
S.S. Electrode

Probe #3  
Critical High REF  
S.S. Electrode

Submersible Level  
Transducer, Type SBLT

**Installation Note:**

- Type SBLT Submersible Level Transducer shall be suspended 6" above the bottom of the tank
- Probe #1, High Level ON, shall be suspended 3" below the tank overflow



Project:

DRAWING DESC.

**SENSOR ASSEMBLY**

CUSTOMER:

DRAWN BY:

DWG. NO.:

CCS42011033

DATE:

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