V-TORK®

V-TORK USA

VTM Series Electric Actuator

Battery Backup Type
Version 1.0 and 1.5 Control Card

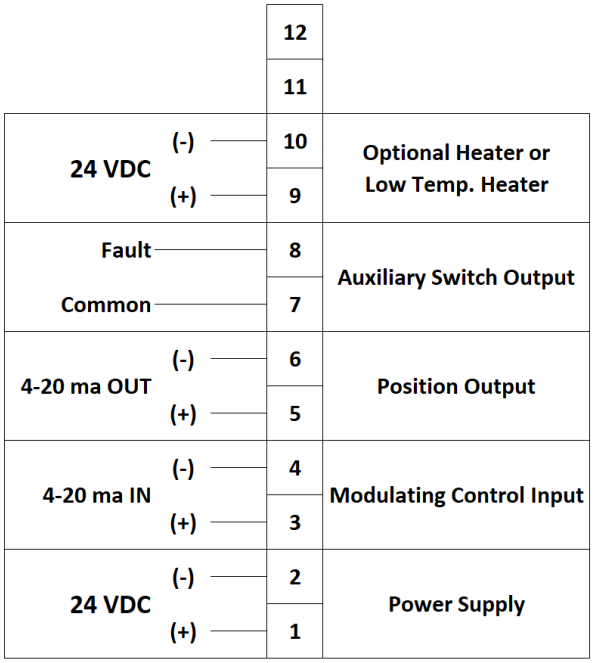
Instruction Manual

- **Quarter-Turn Electric Actuator**
- **Optional Failsafe Battery Backup**
- **Wide range of sizes and torque outputs**
- **Explosion-proof enclosure**

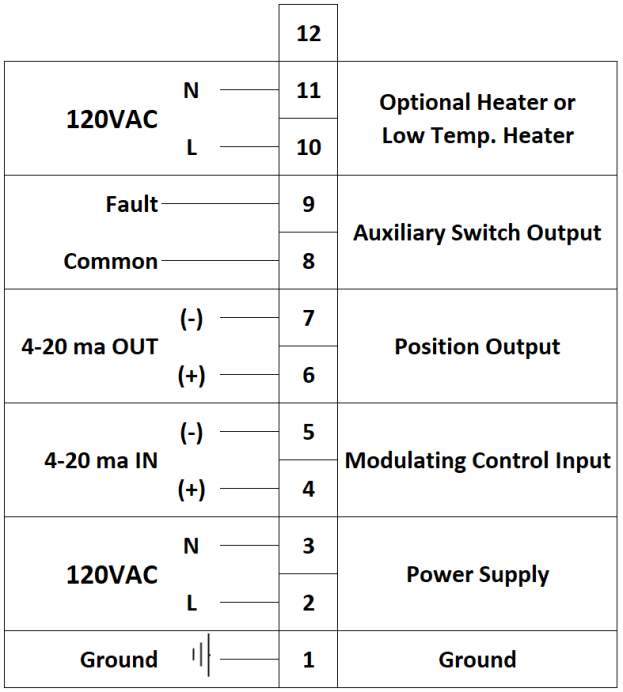
DNV Ex ATEX 94/9/EC

ABS

VTM Modulating Version 1.0 Wiring Diagram（24VDC）with battery backup



VTM Modulating Version 1.0 Wiring Diagram（120VAC) with battery backup



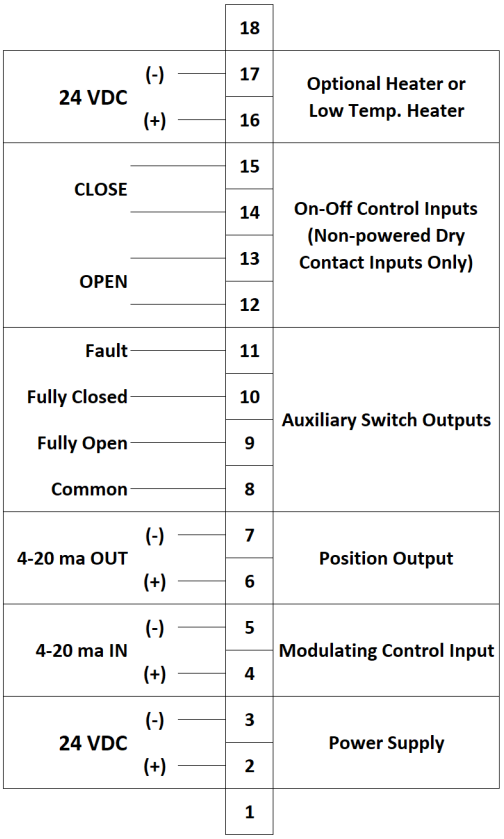
VTM On-Off Version 1.0 with Battery Backup Wiring Diagram (24VDC)

24 VDC (-)	12	Optional Heater or Low Temp. Heater
24 VDC (+)	11	
Fault	10	Auxiliary Switch Output
Fault	9	
Fully Closed	8	Auxiliary Switch Outputs
Fully Open	7	
Common	6	
CLOSE	5	On-Off Control Inputs (Non-powered Dry Contact Inputs Only)
OPEN	4	
COMMON	3	
24 VDC (-)	2	Power Supply
24 VDC (+)	1	

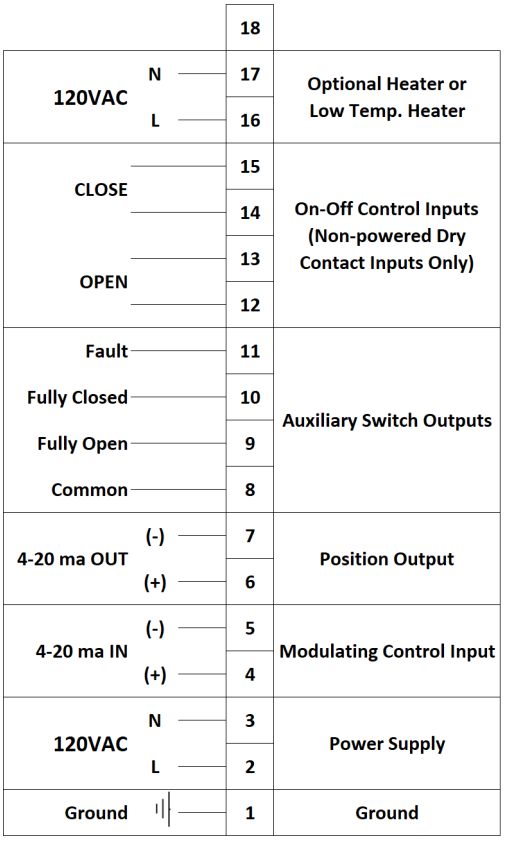
VTM On-Off Version 1.0 with Battery Backup Wiring Diagram (120VAC)

	14	
120VAC N	13	Optional Heater or Low Temp. Heater
120VAC L	12	
Fault	11	Auxiliary Switch Output
Fault	10	
Fully Closed	9	Auxiliary Switch Outputs
Fully Open	8	
Common	7	
CLOSE	6	On-Off Control Inputs (Non-powered Dry Contact Inputs Only)
OPEN	5	
COMMON	4	
120VAC N	3	Power Supply
120VAC L	2	
Ground	1	Ground

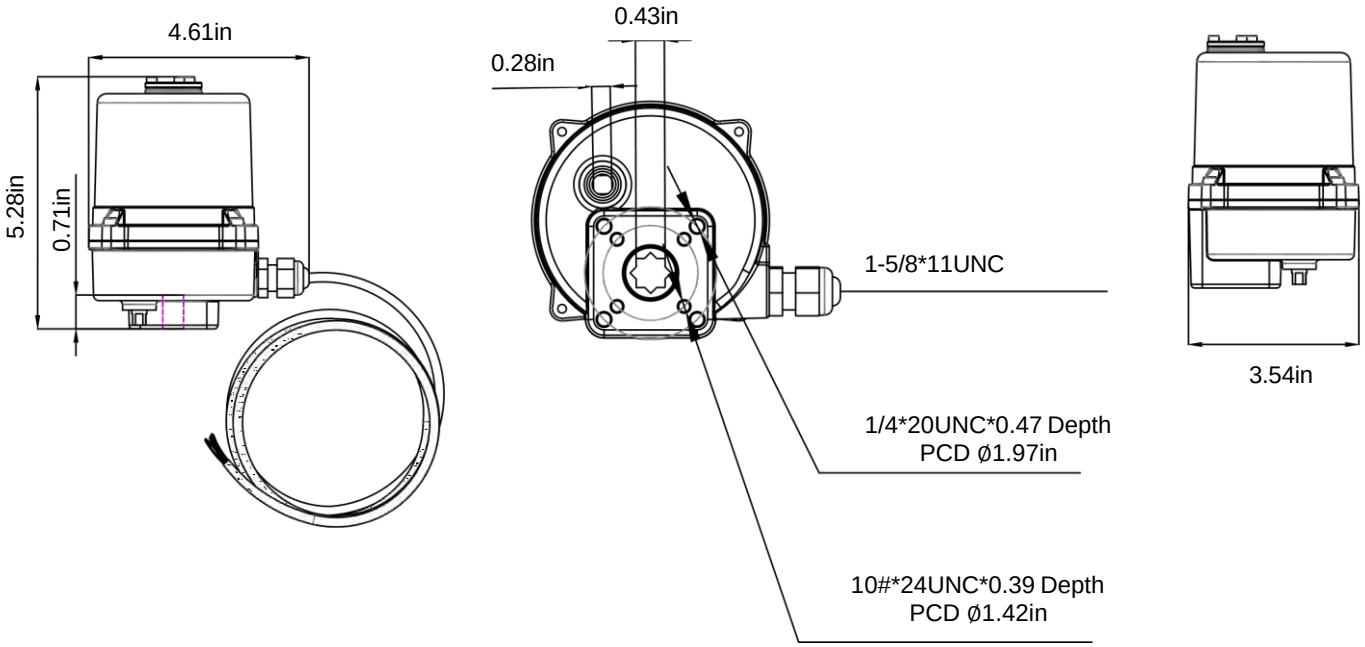
VTM Version 1.5 and 2.0 with Battery Backup Wiring Diagram (24VDC)



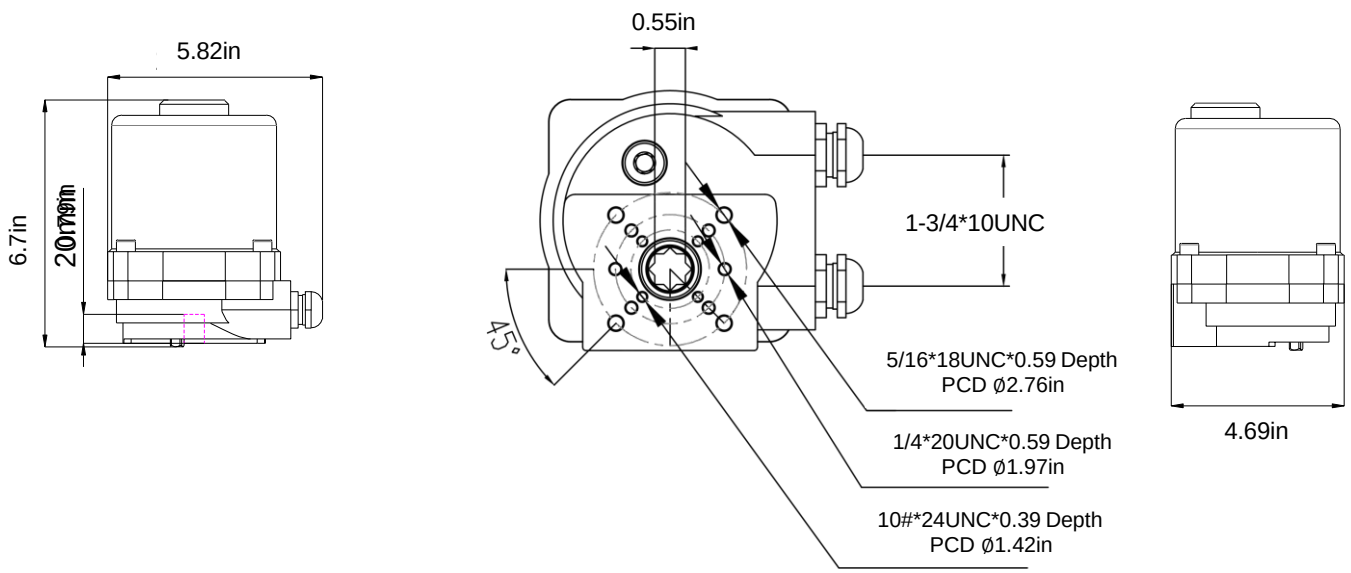
VTM Version 1.5 and 2.0 with Battery Backup Wiring Diagram (120VAC)



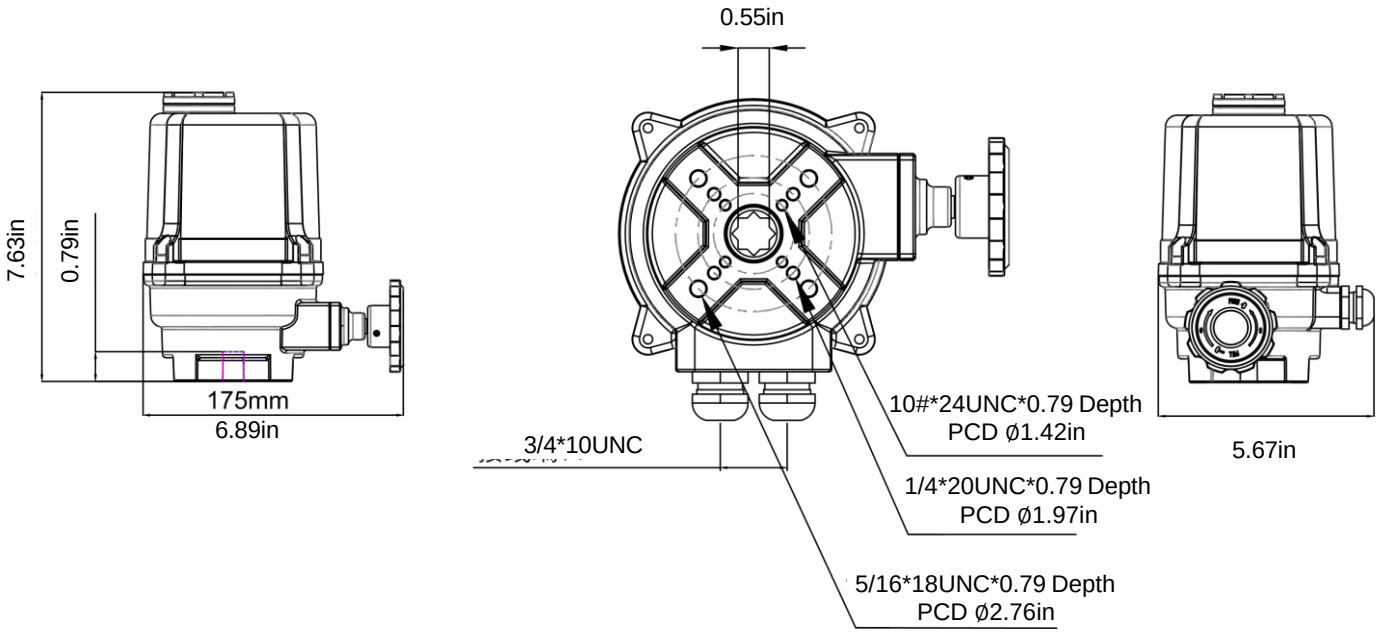
VTM0S Dimensions



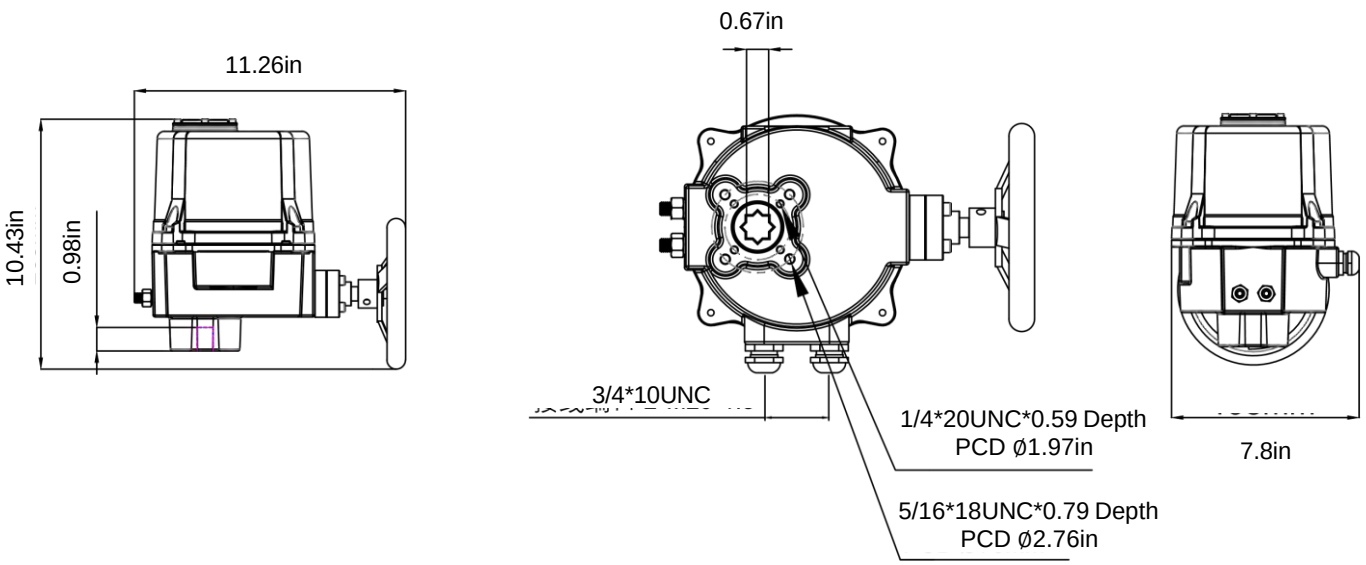
VTM1S Dimensions



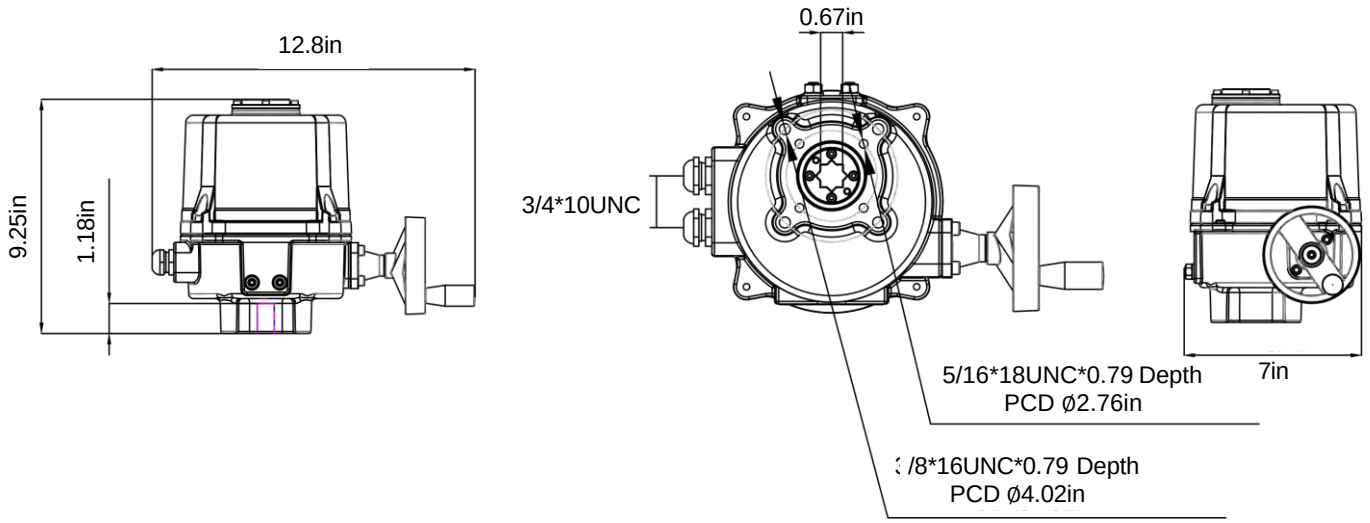
VTM1H Dimensions



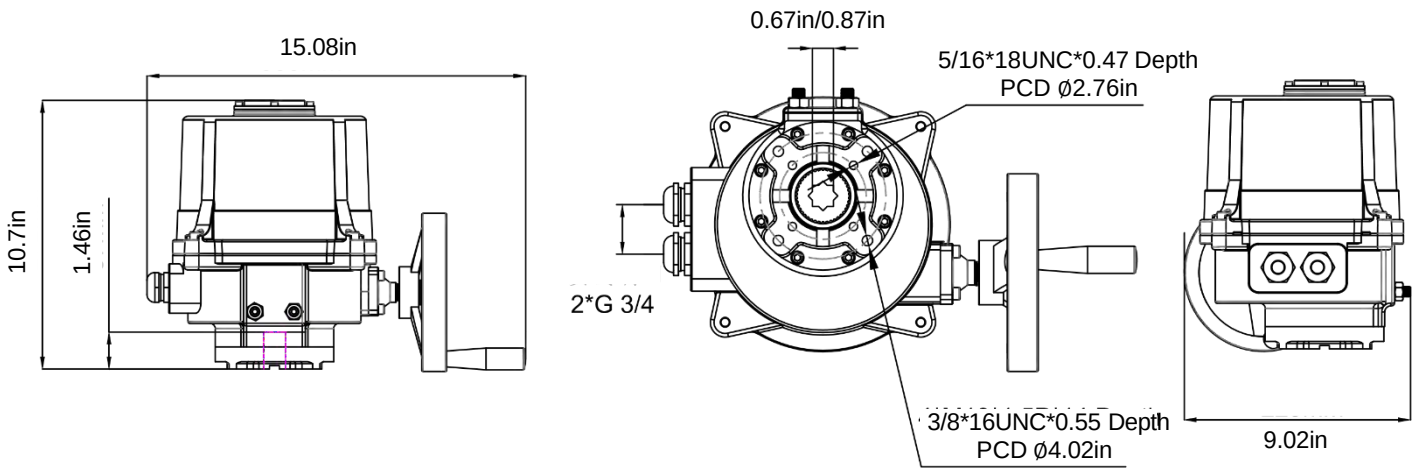
VTM2H Dimensions



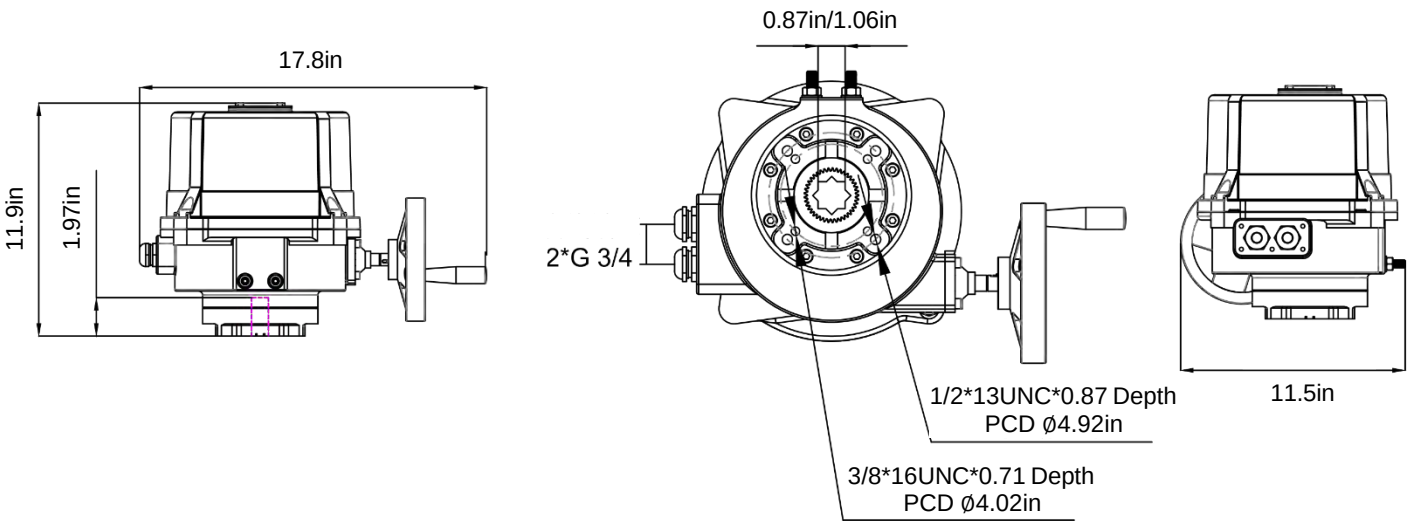
VTM2 Dimensions



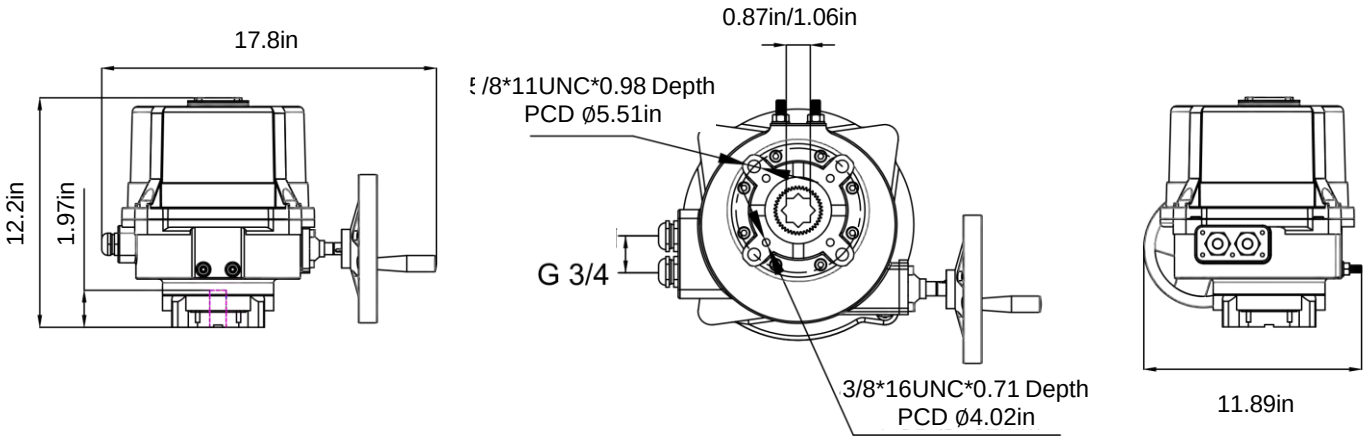
VTM3 Dimensions



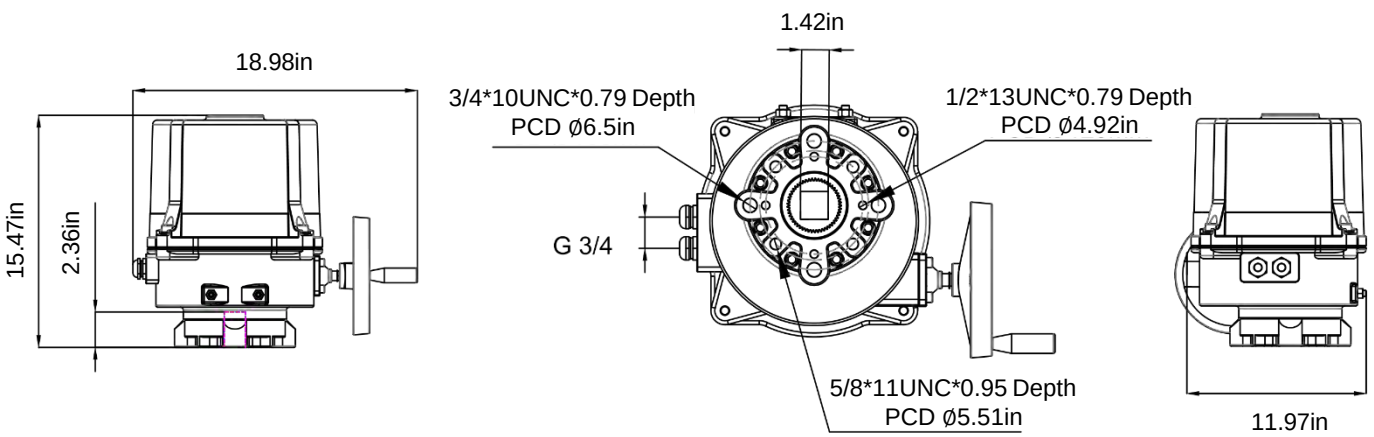
VTM4 Dimensions F10-F12



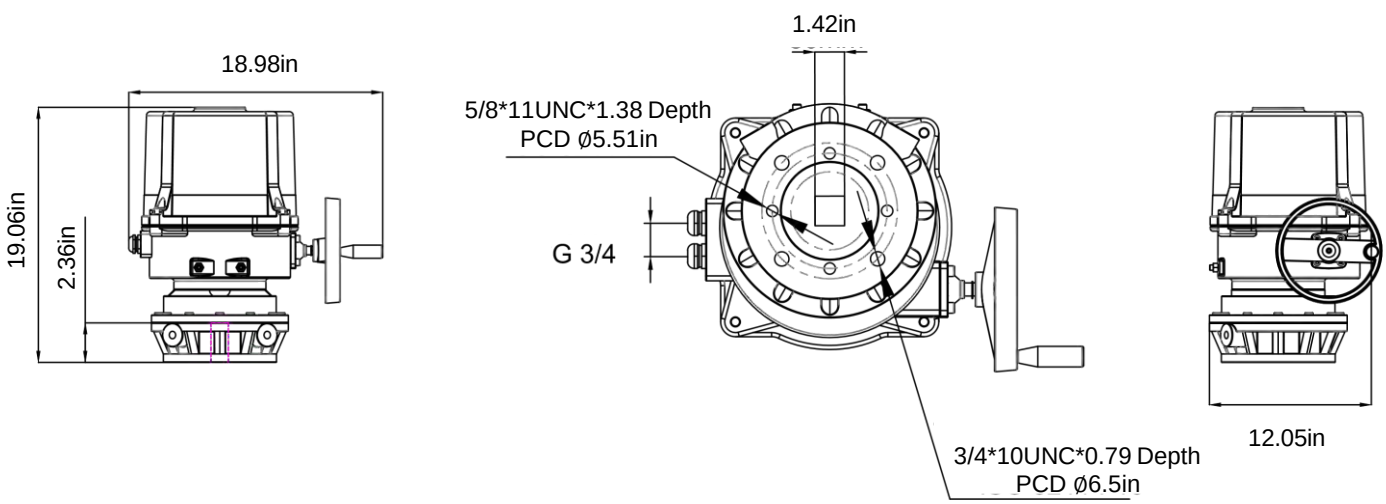
VTM4 Dimensions F14



VTM5 Dimensions



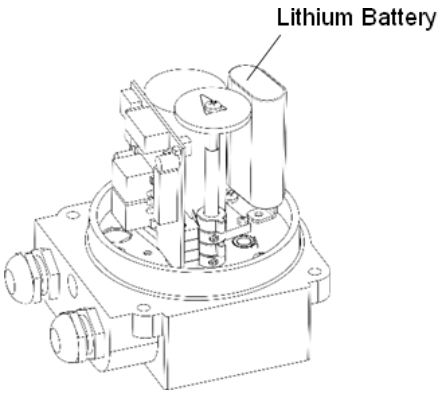
VTM5+G Dimensions



VTM Battery Backup Options

introduction

When the VTM is powered off and the valve is not in the fail position, the product will use its backup battery to drive the motor to operate the valve to the fail position. This backup battery will be charged with daily use. The lithium batteries have reserve power to operate the actuator up to 10 times in a brief time



Configuration Instructions for Battery Backup version

There are four key parameters that can be configured in the VTM Series Battery Backup Electric Actuator:

1. The open and close stop limits can be configured between 0° and 360° rotation.
2. The fail position for input signal loss can be configured as OPEN, CLOSE or STOP (LAST).
3. The fail position for power loss can be configured as OPEN, CLOSE, or a specific position between 0 and 100% rotation.
4. The Power Loss Fail function can be enabled or disabled; with this function enabled, the actuator will fail to the selected position upon power loss; with this function disabled, the actuator will remain in the last position upon power loss.

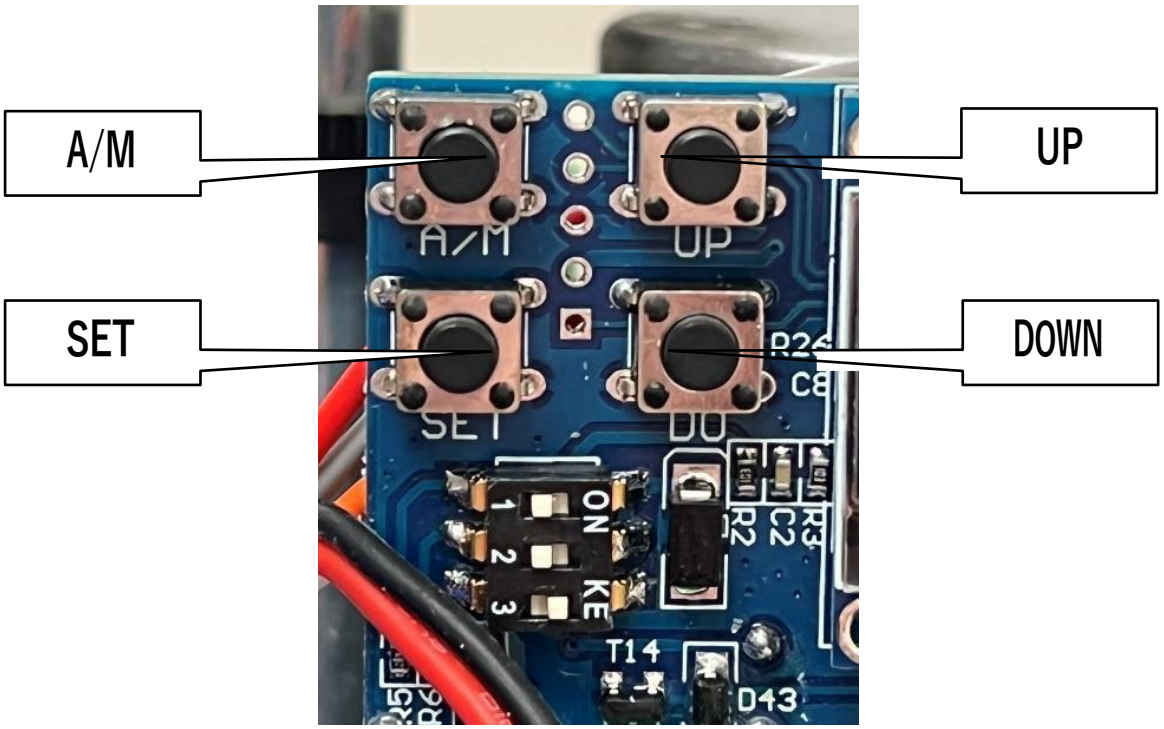
All configuration functions are performed using the four buttons in the upper left corner of the Control Card.

A/M – Auto/Manual or Remote/Local; also functions as escape button to return to prior menu

UP – Up button; increases values or moves up a row in the menu

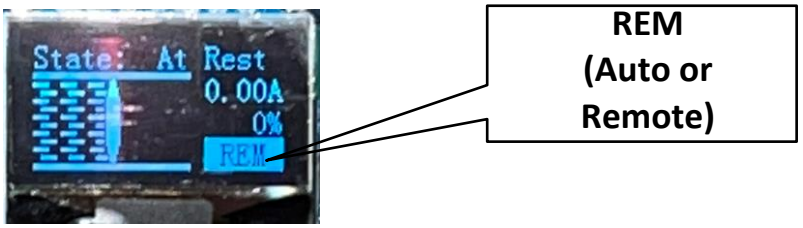
SET – functions as the enter button

DO – Down button; decreases values or moves down a row in the menu



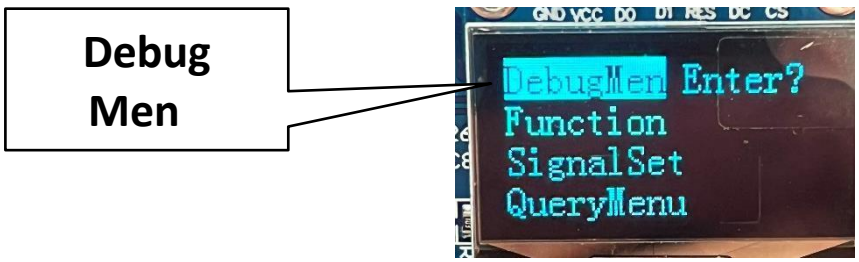
NOTE: The A/M button must be set to Auto (display will show REM) prior to starting configuration process.

NOTE: The A/M button must be set to Manual (Local) to operate the handwheel and manually rotate the actuator/valve

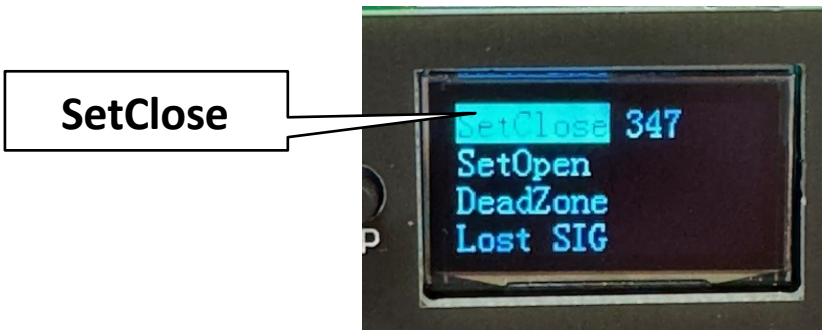


CONFIGURING STOP LIMITS

1. The stop limits are configured on the control card by selecting corresponding resistance value (ohms) of the 0-1000 ohm potentiometer that corresponds to the actuator rotation (degrees) as shown in chart below for the desired Closed and Open positions. The stop limits can be set anywhere between 0° and 360°.
2. To set the closed position, the actuator should be mounted on valve with the valve in the CLOSED position.
3. Hold down the DO button for 5 seconds until the menu appears as shown below



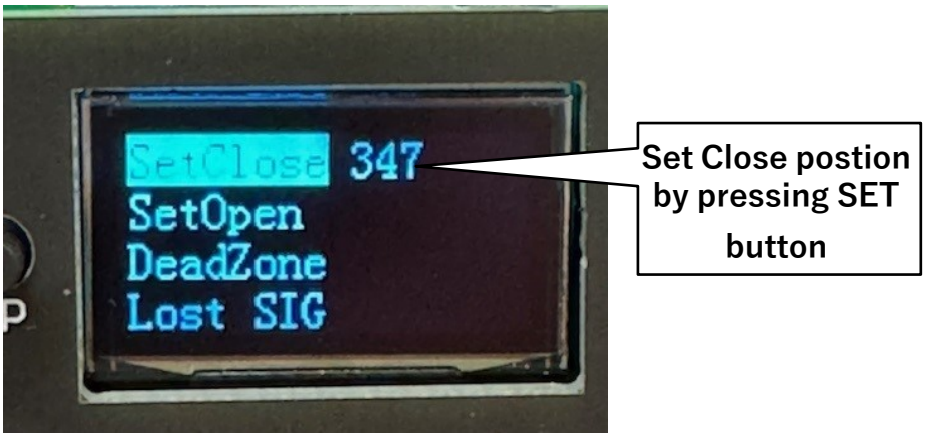
4. "Debug Men" will appear on the first row of the menu. Push the SET button to enter the Debug menu
5. Set the Close position by selecting "SetClose" and pushing the SET button as shown below



6. The CLOSE and OPEN positions are set according to the position of the 0-1000 Ohm potentiometer output resistance values (ohms) corresponding to the actuator rotation (in degrees)

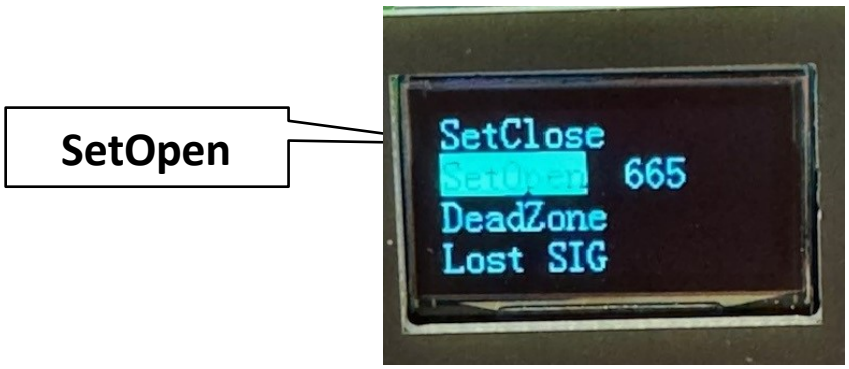
CAUTION: DO NOT SET THE OPEN OR CLOSE POSTION AT A VALUE LESS THAN 100

7. Set the CLOSE position by increasing or decreasing the resistance value (in ohms) using the UP and DO buttons to select the appropriate value when the valve is closed.

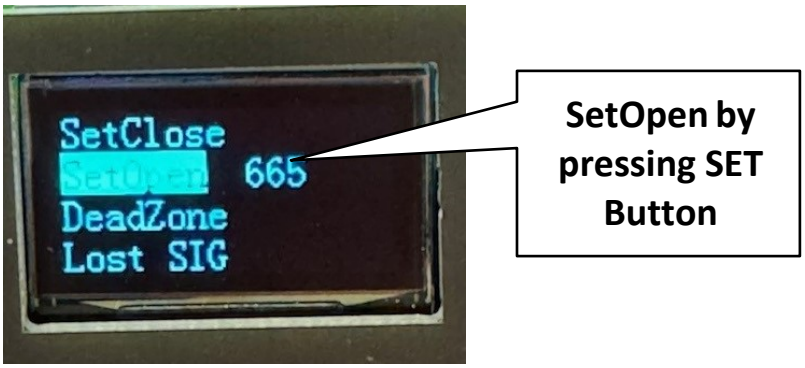


8. As you increase or decrease the “SetClose” value, the actuator/valve will rotate to the selected position.
9. Use the UP and DO buttons to fine tune the exact stop limits for the actuator/valve.
10. Once the final value is determined, push the SET button to save the value.

11. To set the OPEN position, select “SetOpen” by scrolling down the menu using the DO key and pushing the SET button.



12. Select the OPEN position by increasing or decreasing the resistance value (in ohms) using the UP and DO buttons to select the appropriate value once the valve is exactly open.



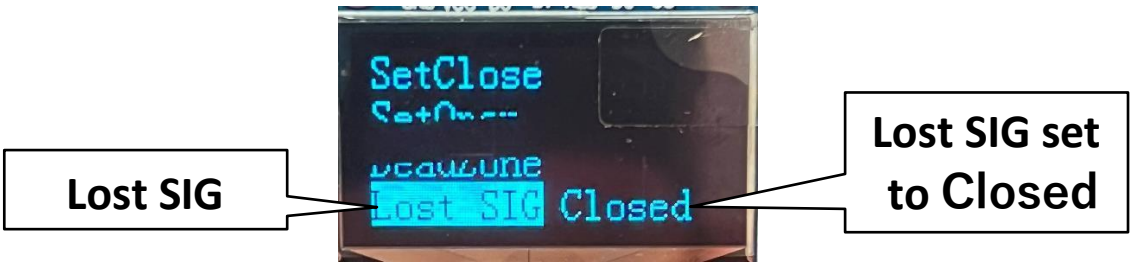
13. As you increase or decrease the “SetOpen” value, the actuator/valve will rotate to the selected position.
14. Use the UP and DO buttons to fine tune the exact stop limits for the valve.
15. Once the final value is determined, push the SET button to save the value

CONFIGURING INPUT SIGNAL LOSS FAILURE POSITION

This configuration will allow the user to select the position the actuator will assume if the input signal is lost.

1. Hold down the DO button for 5 seconds until the menu appears

2. “Debug Men” Enter will appear on the first row of the menu. Push the SET button to enter the Debug menu
3. Scroll down the menu using the DO button until you reach the “Lost SIG” parameter and push the SET button to enter the parameter



4. Choose the desired Signal Loss Failure position using the UP and DO keys:

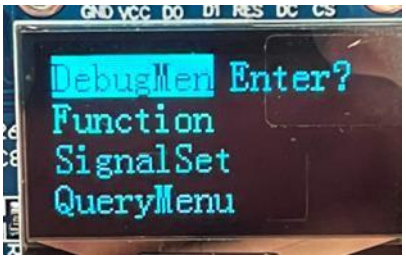
    a. OPEN – upon input signal loss the actuator will rotate to the OPEN position
    b. CLOSED - upon input signal loss the actuator will rotate to the CLOSED position
    c. STOP - upon input signal loss the actuator will remain in the LAST position the actuator was in prior to input signal loss

5. Once the desired value is selected, push the SET button to save the value

CONFIGURING THE POWER LOSS FAIL POSITION

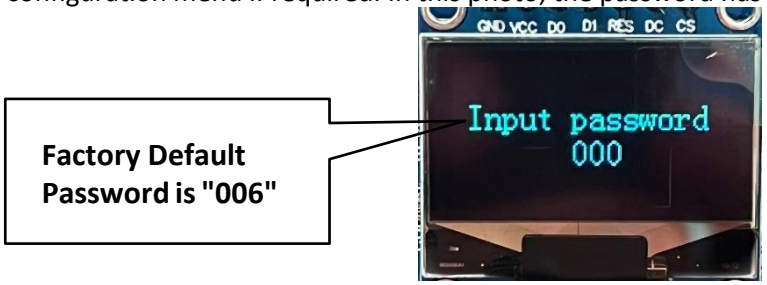
This configuration will allow the user to select the position the actuator will assume if the supply power is lost. The power loss fail position can be set to any position between 0 and 100% of the configured stop limits.

1. Hold down the DO button for 5 seconds until the menu appears

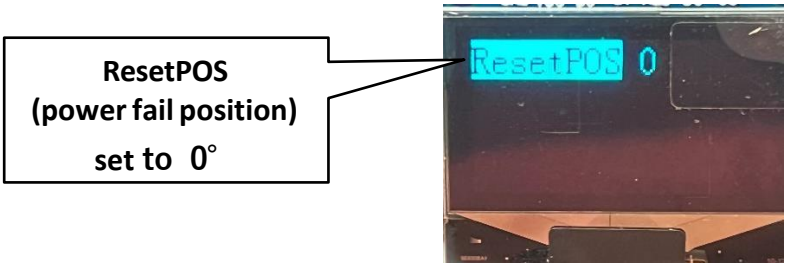


2. Using the DO button to scroll down to “Function” and push the SET button to enter

3. After pushing SET button to enter, there will be a prompt for the password. The factory default password is “006”. Push the SET button to enter the password. The password may be changed to another 3-digit number in the configuration menu if required. In this photo, the password has been changed to "000".



4. Scroll down the menu using the DO button to “ResetPOS” and push the SET button to enter



5. Select the desired power loss fail position by using the UP and DO buttons. The value may be any number between 0 and 100% of the configured rotation of the actuator/valve.
6. Once the desired value is selected, push the SET button to save the value

CONFIGURING THE POWER LOSS FAIL FUNCTION

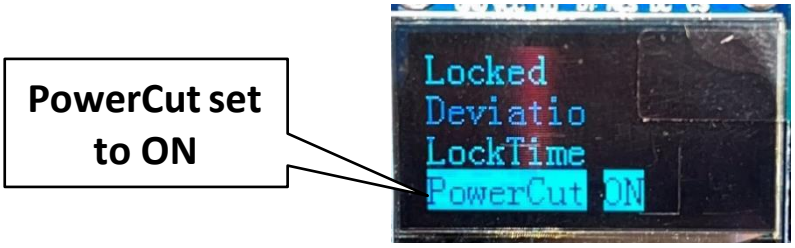
This allows the user to enable or disable the Power Loss fail function

1. Hold down the DO button for 5 seconds until the menu appears

2. Using the DO button to scroll down to “Function” and push the SET button to enter

3. After pushing SET button to enter, there will be a prompt for the password. The factory default password is “006”. Push the SET button to enter the password. The password may be changed to another 3-digit number in the configuration menu if required. In this photo, the password has been changed to "000".

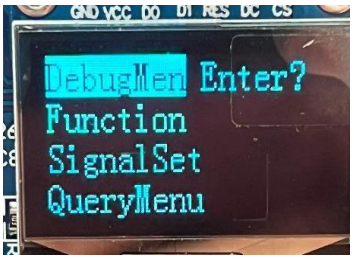
4. Scroll down the menu using the DO button to “PowerCut” and push the SET button to enter



5. Select “ON” to enable the Power Loss Fail function or select “OFF” to disable the Power Loss Fail function.
6. Once the desired value is selected, push the SET button to save the value

CONFIGURING INPUT SIGNAL

1. This section will explain how to set the low and high signal inputs for the actuator. Normally, for a modulating control M1 option (4-20ma), the factory default is to have the low signal set for 4ma and 0%; the high signal set at 20ma and 100%. This can be changed by the user to any range required, including reverse or split control.
2. In the example shown below we will set the input signals with 4ma input as the low signal at 0% and with 20ma as the high signal at 100%. This means that when 4ma is sent to the actuator, the actuator will rotate to 0% and when 20ma is sent to the actuator it will rotate to 100%.
    a. The position for 0% and 100% is determined by the configuration steps above in setting the stop limits.
3. Connect a 4-20ma signal generator to the input signal terminals
4. To adjust the Low Signal (Low Sig) input
5. Hold down the DO button for 5 seconds until the menu appears as shown below



6. Scroll down to the Signal Set and push the SET button to enter the Signal Set menu

7. To calibrate the Low Signal, push SET button
8. Set input from signal generator to 4ma
9. Adjust the Low Signal to 0.0%, push SET button to save
10. To calibrate the High Signal, scroll down to the HighSIG and push SET button

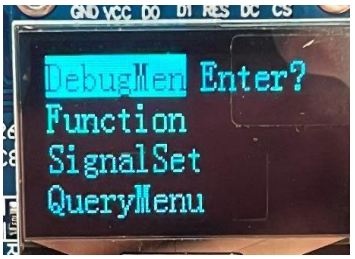
11. Set the input from the signal generator to 20ma
12. Adjust the HighSIG to 100% and push SET button to save

If the application calls for a different range, simply set the Low Signal at the % of the stop limits desired and the High Signal at the % of the stop limits desired.

If the application requires the Low Signal to be rotate the actuator to 100%, apply the low input signal and adjust the LOW SIG to 100%. In the case above, you could configure the actuator to open at 4ma and close at 20ma for reverse modulating control.

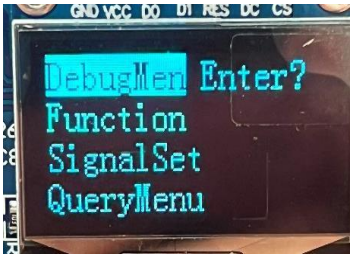
CONFIGURING POSITION OUTPUT SIGNAL

1. The analog output signal represents the position of the actuator which is an output of the potentiometer through the control card to the terminal board.
2. To set the position outputs for 4ma as the Low Position and 20ma as the High Position:
3. Connect a multimeter capable of measuring milliamps to the position output terminals
4. To set the Low Position output at 4ma which would correspond to the 0% position of the actuator determined by the Stop Limits:
5. Hold down the DO button for 5 seconds until the menu appears as shown below



6. Scroll down to the Signal Set and push the SET button to enter the Signal Set menu

7. Select LOW POS and push the SET button.
8. Adjust the LOW POS output signal using the UP and DO buttons until the multimeter indicates 4ma.
9. Push the SET button to save.
10. To set the High Position output at 20ma which would correspond to the 100% position of the actuator determined by the Stop Limits:
11. Hold down the DO button for 5 seconds until the menu appears as shown below



12. Scroll down to the Signal Set and push the SET button to enter the Signal Set menu

13. Select High POS and push the SET button.
14. Adjust the High POS output signal using the UP and DO buttons until the multimeter indicates 20ma.
15. Push the SET button to save.