

# MODEL 3660 THREE RELAY PUMP CONTROLLER / INDICATOR

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**DEVAR Inc.**

706 Bostwick Ave.  
Bridgeport, CT. 06605

<http://www.devarinc.com>  
TEL: (203) 368-6751, (800) 566-6822  
FAX: (203) 368-3747

file: 3660 MANUAL.wpd



## IMPORTANT INFORMATION

Each 3660 is shipped factory calibrated.

The default calibration, scaling, and setup procedures performed at the factory is detailed in appendix A.

Field installation requires mounting, wiring, scaling the display to match the range of the transducer, setting the control points for the pumps, and setting the operational features.

Sample Input is not part of the field installation and is not meant to be performed in the field.

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## 1 GENERAL INFORMATION

The 3660 is a pump controller with features that allow it to be installed in a variety of different applications and still be simple to set up and operate. The 3660 is in a NEMA 4X rated surface mount plastic enclosure. Power can be either 110VAC, switchable 110/220VAC, or 9.5 to 30VDC, depending on model. The standard input is a 4/20mA signal. A fused, energy limited loop power supply is provided. The 3660 has three output relays and an error relay. Two of the output relays are dedicated to pump control, the third can be configured as either a pump control or as an alarm. The 3660 can be used as either a simplex, duplex or triplex controller, with or without alternation.

### 1.1 Front Panel Controls, Indicators, and Display

The front cover is latched and hinged to provide easy and rapid access to the front panel. The front panel is attached with captivated thumbscrews to facilitate removal. Removing the front panel provides access to additional controls. Once the thumbscrews are loosened, the panel pivots out of the way around a third screw. Captivating the panel in this way prevents it's loss while the additional controls are being used.

The backlit LCD display has four 0.7" high digits. The display 3660 is capable of a numeric range from -1999 to 9999, with a selectable decimal point. The display will read "-ovr" for values less than -1999, "ovr" for values greater than 9999, and "ouch" if the input signal becomes too large.

Amber lamps indicate the state of PUMP A, PUMP B, and AUX. A red ERROR lamp indicates that a fault condition prevents proper operation. A rotary switch selects what is being indicated on the display from the choices listed on the front panel. A lit EDIT lamp confirms that the displayed value can be modified by using the MORE, LESS, NEXT, and STORE pushbuttons. Refer to section 4. The EDIT lamp is located to the left of the pushbuttons

Removing the front panel exposes a DIP switch, a lamp, and a label. The label lists the DIP switch functions and shows the setup function assigned to the rotary switch. The lamp indicates when these functions are active. Refer to section 3.

### 1.2 Input, Output, and Power Wiring Points

All wiring is accessed through a separate removable panel. Connections are made to screw clamp terminal blocks. There are three terminal blocks, one for the loop power supply and input signal, one for the relay outputs, and one for power. The loop supply and input signal terminal block is separated from the other two terminal blocks by a physical barrier. The enclosure contains knockouts to facilitate attaching cable grips, conduit, etc.

### 1.3 Operational Feature Overview

The 3660 is a microprocessor based instrument with very simple user controls, which are clearly labeled. The numerical range of the display is -1999 to 9999, which is more flexible and allows for greater precision than the typical 3-1/2 digit meter. The 3660 comes from the factory scaled in inches for a ten pound submersible transmitter. Changing the scaling for a different transmitter or measurement scale is accomplished

by changing the values of two numbers stored internally. A variance between a measured level and the level displayed on the 3660 will occur when the transmitter is mounted so that the measurement range of the transmitter does not exactly coincide with the depth of the tank. This can occur when a pressure transducer is mounted above or below the bottom of the tank, and always occurs for an ultrasonic transducer. This difference is quickly cancelled out by adjusting the value of OFFSET, which is added to the displayed value.

Each pump relay is controlled by two settings: the level it turns on and the level it turns off. This method automatically configures control for either a pump up or pump down situation, no switches need to be flipped or wires changed. The AUX relay can be set to act in one of five different ways: two types of pump control and three types of alarm. Pump alternation is activated with a DIP switch.

The operation of the 3660 relies on the settings and control values. Accidental modification of any of the control values and settings is prevented by requiring that the DIP switch allowing that particular setting to be edited is activated. In addition, the settings for the pumps, AUX, and the OFFSET can also be modified after entering an access code. The access code allows operators to readily modify values that might change from time to time without having to remove the front panel and setting the DIP switches. A lamp indicates when the displayed parameter can be edited.

Several methods are employed to ensure errorless operation of the 3660, and to provide a positive indication when an error is detected. The error output relay is activated by a circuitry failure, a power failure, and an input signal failure. When an error is detected the ERROR lamp will light and the PUMP and AUX relays will be de-energized. This will cause the pumps to be shut off. If AUX is set to act as an alarm, it will activate.

## **2 INSTALLATION**

This section details the steps to install and configure the 3660. Complete this section before section 3. Do not attempt to run the pumps until sections 2 and 3 are complete. Section 3 explains how to set up the points that turn on and off the PUMP A, PUMP B, and AUX relay outputs.

### **2.1 MOUNT AND WIRE THE 3660 (required step)**

The appendix contains a mounting drawing and generalized wiring diagram.

#### **2.1.1 Connector J1, Relay Outputs**

The relays are all form C. Terminals are provided to wire to the arm (A), normally closed (C), and normally open (O) contacts. Normally open and closed refers to the relay connections when all power is removed from the controller.

##### **2.1.1.1 PUMP A and PUMP B**

The lamp lights and there is continuity between A and O when the process reaches the PUMP ON value. Pumps are typically wired to the A and O contacts. Loss of the controller turns the pumps off.

### 2.1.1.2 AUX

Wiring AUX depends on the control method, detailed in sections 3.41 to 3.4.5.

#### 2.1.1.2.1 AUX Pump Controller Functions: Ctrl and Alt

Refer to 2.1.1.1.

#### 2.1.1.2.2 AUX Alarm Function: ALM

The lamp lights and there is continuity between A and C when the process reaches the AUX TRIP value. Alarms are typically wired to the A and NC contacts. Loss of the controller turns the alarm on.

#### 2.1.1.2.3 AUX Window Functions: out and inSd

The lamp lights and there is continuity between A and O when the selected window condition has been met.

#### 2.1.1.3 ERROR output

For a closed contact on error, wire to A and C. For an open contact on error, wire to A and O.

### 2.1.2 Connector J2, Power

Contains three connection points: GND, L1 and L2. Nominal power is 110VAC. Optionally powered units are available. Power options are identified by a suffix on the model. A switchable 110/220VAC power option is identified by "-230". A 9.5-30VDC power option is identified by "-DC"

#### 2.1.2.1 Connector J2, AC Power

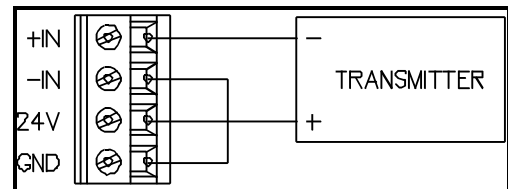
Connect AC to the L1 and L2 terminals. Connect HOT to either terminal, both are fused.

#### 2.1.2.2 Connector J2, DC Power

Connect DC power, (+) to the L1 terminal and (-) to the L2 terminal. The L1 terminal line is fused. A 43V zener diode prevents reverse connection and over voltage conditions.

### 2.1.3 Connector J3, Input Signal and Loop Power

This wiring diagram illustrates the simplest installation. Additional loop devices, such as a local display, are typically added in the 24V to +Transmitter leg. Note that J3 GND is connected to J2 GND.



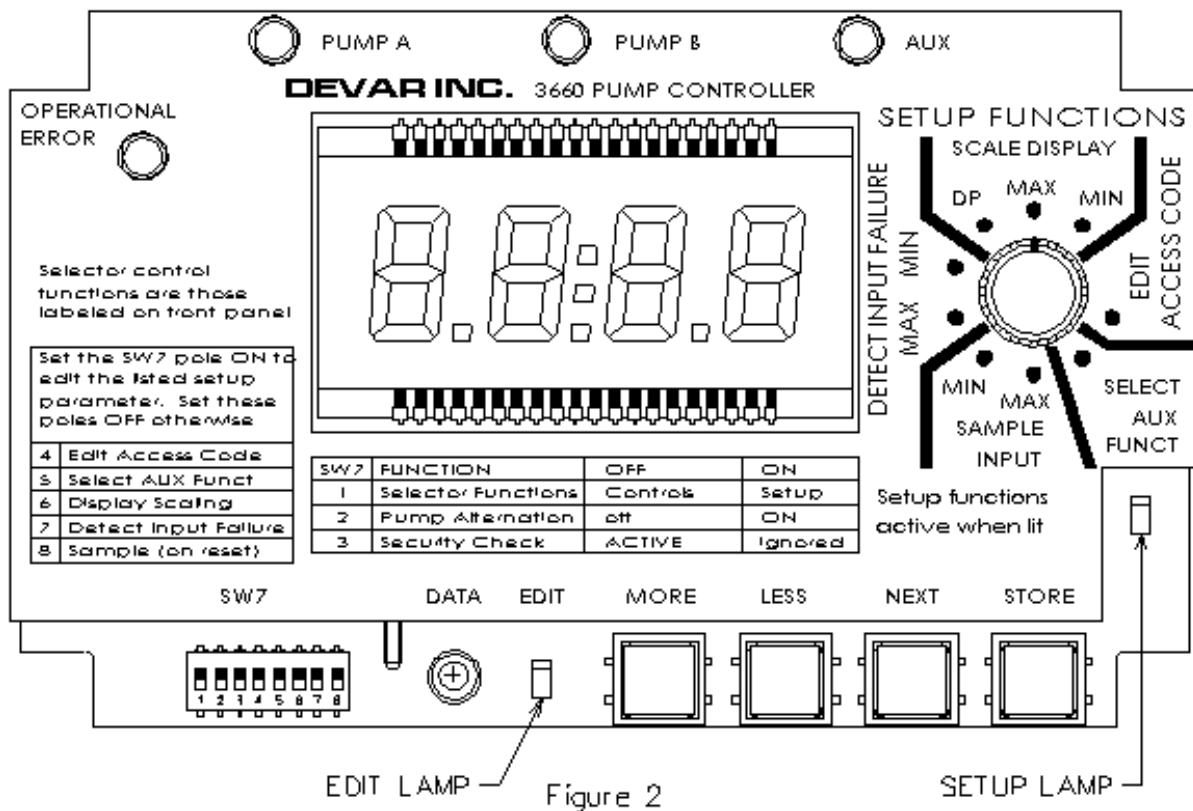
## 2.2 APPLY POWER (required step)

The display will indicate 3660, the firmware build date, "run", and the rotary switch selection. After displaying run, the input signal is measured and evaluated. The relays are then set appropriately. The control relays will remain de-energized until the input is measured and evaluated. The error relay energizes when normal operation starts and stays energized until the controller fails in some manner. Once operating, the input is always being measured and evaluated, regardless of what is on the display.

### 3 SETUP AND CONFIGURATION

This section details the steps to configure the 3660. Complete this section before section 4. Do not attempt to run the pumps until sections 3 and 4 are complete. Section 4 explains how to set up the points that turn on and off PUMP A, PUMP B, and AUX.

The front panel is attached to the enclosure with captivated thumb screws to simplify accessing the configuration controls. A screw binds the panel to the enclosure and acts as a pivot point around which the loosened panel will rotate. Removing the front panel exposes a label and additional controls that are used to configure the 3660. Refer to figure 2. The controls consist of a 9 position rotary switch, four pushbutton switches, and an eight position DIP switch labeled SW7. There is also a spot labeled SW5 that may contain a four position DIP switch which is intended for future expansion. Put SW7 pole 1 ON to activate the setup functions, the “setup functions active when lit” lamp will light.



#### 3.1 SCALE THE DISPLAY

Scaling the display causes the 3660 to read the values desired for the installation, such as height of water in the tank, the level of water below some point, or pressure in a main. The display can be set to read in whatever measurement unit desired, including inches, feet, meters, pounds, and percent. The scaling must match the range of the transmitter. The factory default scaling is 0.0 minimum and 277.2 maximum, which is appropriate for a 10 pound pressure transducer scaled in inches. The conversion factor is 2.310 feet or 27.72 inches of water per PSI.

Remove the front panel to expose the setup label and DIP switch SW7. Turn the knob to DISPLAY DP. Set the DIP switch SW7 pole 1 on and the “setup active” lamp

lights. Set SW7 pole 6 ON and the EDIT lamp lights. Press NEXT to move the decimal point to the desired location. Press STORE and SAVE is displayed to confirm the new value. Turn the rotary knob to DISPLAY MIN. The left digit is flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Change the display to the desired value. Press STORE and SAVE is displayed as confirmation. Turn the knob to DISPLAY MAX. The left digit is flashing. Change the display to the desired value. Press STORE and SAVE is displayed as confirmation. Set SW7 poles 1 and 6 OFF and the lamps goes dark. Scaling is complete. Reassemble.

3.1.1 Display DP placement of the decimal point.

3.1.2 Display MIN the number the display will read for a 4mA input.

3.1.3 Display MAX the number the display will read for a 20mA input.

### 3.2 INPUT FAILURE DETECTION

When a transmitter fails it will typically output a current beyond the defined 4 to 20mA range, such as more than 21mA or less than 3.5mA. When a transmitter that measures 23ft is placed in a 12ft deep well, an indication below 0ft or greater than 12ft is erroneous. These two bits of information can be used to determine if the transmitter is functional. The input failure detection feature allows the selection of two points to define a valid input signal range. A system error is generated if the input signal goes outside the defined range. A system error will turn off the pumps, light the ERROR lamp, and trip the ERROR relay. If AUX is configured as an alarm it go to the tripped position.

The default setting for detect input failure MIN point is -20.0 and 300.0 for MAX point. Setting MIN and MAX to the same value disables the detect input failure function. Devar recommends that the MIN and MAX points be set to a value approximately 5% to 10% outside the indicating range points.

Example:

The 3660 will control the level of water in a tank. A ten pound pressure transmitter is mounted in the outflow pipe of a tank several feet below the bottom of the tank. The desire is to indicate the height of water in the tank, measured in feet. The display is scaled for the measurement range of the transducer, which is 0.00 to 23.10ft. The tank water depth is measured at 10ft 2-1/2inches, or 10.21ft. The rotary switch is turned to "RUN" and the display reads 14.70ft. The measurement range needs to be offset by  $10.21 - 14.70 = -4.49$  to read the desired value. The display reads the depth of the tank, and the pumps are set to the values required to control the depth of the water.

The 0.00ft to 23.10ft measurement range of the transmitter has been offset by -4.49ft to make an indicating range of -4.49ft to 18.71ft. 5% of the display scaling is about 1ft. The input failure detection points could be set at -5.00ft to -6.00ft and 19.00ft to 20.00ft.

Remove the front panel to expose the setup label and DIP switch SW7. Turn the knob to DETECT INPUT FAILURE MIN. Set the DIP switch SW7 pole 1 on and the “setup active” lamp lights. Set SW7 pole 7 ON and the EDIT lamp lights. The left digit is flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Change the display to the desired value. Press STORE and SAVE is displayed as confirmation. Turn the knob to DETECT INPUT FAILURE MAX. The left digit is flashing. Change the display to the desired value. Press STORE and SAVE is displayed as confirmation. Set SW7 poles 1 and 7 OFF and the lamps goes dark. Setting the input failure detection points is complete. Reassemble.

### 3.2.1 Detect Input Failure Min

The DETECT INPUT FAILURE MIN point should typically be set to a number that is 5% to 10% of the span beyond the DISPLAY MIN point.

### 3.2.2 Detect Input Failure Max

The DETECT INPUT FAILURE MAX point should typically be set to a number that is 5% to 10% of the span beyond the DISPLAY MAX point.

### 3.2.3 Disabling Input Failure Detection

Input Failure Detection is disabled by setting MIN and MAX to the same value.

## 3.3 SAMPLE INPUT MIN / SAMPLE INPUT MAX WARNING (reference only)

Turning the knob to either position displays LOCd. These steps are completed at the factory and are not part of the installation process. Specific equipment and procedures are required to successfully sample the input. **Performing the SAMPLE INPUT routines incorrectly will cause the 3660 to become inoperable.** Refer to Appendix A, Page 1.

## 3.4 SET THE AUX FUNCTION TYPE (required if AUX is used)

AUX can be set to function in any one of the ways detailed in sections 3.4.1 - 3.4.5. Refer to the wiring diagram in Appendix B Page 2 for illustrations of the relay states.

Remove the front panel to expose the setup label and DIP switch SW7. Turn the knob to SELECT AUX FUNCT. Set the DIP switch SW7 pole 1 ON and the “setup active” lamp lights. Set SW7 pole 5 ON and the EDIT lamp lights. Press NEXT until the desired function type is displayed. Press STORE, SAVE is displayed as confirmation. Set SW7 pole 1 and 5 OFF, the lamps darken. Selecting the AUX function type is complete. Reassemble.

### 3.4.1 AUX Function: CtrlL

This sets AUX to act as a pump control. When the process reaches the TRIP value the lamp lights and the A and O contacts close. When the process reaches the RESET value the lamp darkens and the A and C contacts close. AUX will not alternate. This is suitable for an application with three non-alternating pumps or if the third pump is a jockey pump.

### 3.4.2 AUX Function: Alt ( factory default )

This sets AUX to act as a pump control that can alternate. When the process reaches the TRIP value the lamp lights and the A and O contacts close. When the process reaches the RESET value the lamp darkens and the A and C contacts close. AUX will alternate with PUMP A and PUMP B when alternation is enabled. This is suitable for an application with three pumps where all three either do or do not alternate.

### 3.4.3 AUX Function: ALM

This sets AUX to act as an alarm. When the process reaches the TRIP value the lamp lights and the A and C contacts close. When the process reaches the RESET value the lamp darkens and the A and O contacts close. The ALM control method is suitable for a horn or other device intended to alert personnel to problems, with wiring going to A and C. These contacts will close on the loss of the controller.

### 3.4.4 AUX Function: out

This sets AUX to act as a window function, tripping when outside the defined range. When the process is at or outside the RESET and TRIP values the lamp lights and the A and O contacts close. The lamp is dark and the A and C contacts are closed otherwise. Example: The 3660 is being installed as a duplex controller in a pump down situation. The well is 12' deep and the pump intakes are at 1.5'. AUX is programmed to trip at 90.0" (7.5') and reset at 24.0" (2'). A horn is wired to the AUX O contact. Should the water go to 24.0" and below or 90.0" and above the AUX will activate the horn, alerting operators to the high or low water situation. The horn will not activate if the controller fails.

### 3.4.5 AUX Function: inSd

This sets AUX to act as a window function, tripping when inside the defined range. When the process is at or inside the RESET and TRIP values the lamp lights and the A and O contacts close. The lamp is dark and the A and C contacts are closed otherwise. Example: The situation is the same as in 2.4.4, except that the horn is wired to the AUX C contact. Under normal operating conditions the AUX lamp is lit. Should the water go below 24.0", or above 90.0" the AUX lamp dims and the horn activates, alerting operators to the high or low water situation. The horn will activate if the controller fails.

## 3.5 EDIT ACCESS CODE (not required)

The access code is used to prevent unauthorized modification of the PUMP and AUX control values. Refer to section 4.2. The factory default access code is "0000".

Remove the front panel to expose the setup label and DIP switch SW7. Turn the knob to EDIT ACCESS CODE. Set the DIP switch SW7 pole 1 on and the "setup active" lamp lights. Set SW7 pole 3 and pole 4 ON and the EDIT lamp lights. The left digit is flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Change the display as desired. The access code is a four digit number from 0000 to 9999. Press STORE and SAVE is displayed as confirmation. Set SW7 poles 1, 3, and 4 OFF and the lamps goes dark. Selecting an access code is complete. Reassemble.

### 3.5.1 Disable Access Code

Disable the access code check by placing DIP switch SW7 pole 3 ON.

## 3.6 DIP Switch SW7

Pole 1 is to the left and sliding the switch up is ON.

### 3.6.1 SW7 Pole 1: Selector Functions

Normal operation requires that pole 1 is in the OFF position. Pole 1 controls what the rotary switch selects to be displayed. OFF selects the control functions listed on the front panel and ON selects the setup functions listed on the label underneath.

### 3.6.2 SW7 Pole 2: Alternation

Pump A and pump B will alternate activation when pole 2 is ON. When AUX is set to Alt it will alternate activation along with pump A and pump B.

### 3.6.3 SW7 Pole 3: Security Check

The security check prevents unauthorized or inadvertent modification of the control points by requiring entry of the correct access code before modification is allowed. The security check is disabled when pole 3 is ON.

### 3.6.4 SW7 Pole 4: Edit Access Code

Pole 4 allows the security code value to be changed when the rotary switch is turned to "EDIT ACCESS CODE". Pole 1 and 3 must also be on. Refer to section 3.5.

### 3.6.5 SW7 Pole 5: Select AUX Function

Pole 5 allows the AUX function to be changed when the rotary switch is turned to "SELECT AUX FUNCT". Pole 1 must also be on. Refer to section 3.4.

### 3.6.6 SW7 Pole 6: Scale Display

Pole 6 allows the display scaling to be changed when the rotary switch is turned to the "SCALE DISPLAY MIN", "SCALE DISPLAY MAX", and "SCALE DISPLAY DP" positions. Pole 1 must also be on. Refer to section 3.1.

### 3.6.7 SW7 Pole 7: Detect Input Failure

Pole 7 allows the user to define the valid input signal range when the rotary switch is turned to the "DETECT INPUT FAILURE MIN" and "DETECT INPUT FAILURE MAX" positions. Pole 1 must also be on. Refer to section 3.2.

### 3.6.8 SW7 Pole 8: Sample

This pole is to remain OFF. Refer section 3.3 and appendix A.

## **4 FRONT PANEL ROTARY SWITCH**

If the front panel has been removed, ensure that DIP switch SW7 pole 1 is off, the "setup functions active when lit" lamp is dark, and replace the panel. Refer to figure 2 above. The front panel rotary switch selections are those that are more commonly accessed in a pump controller. Refer to figure 3.

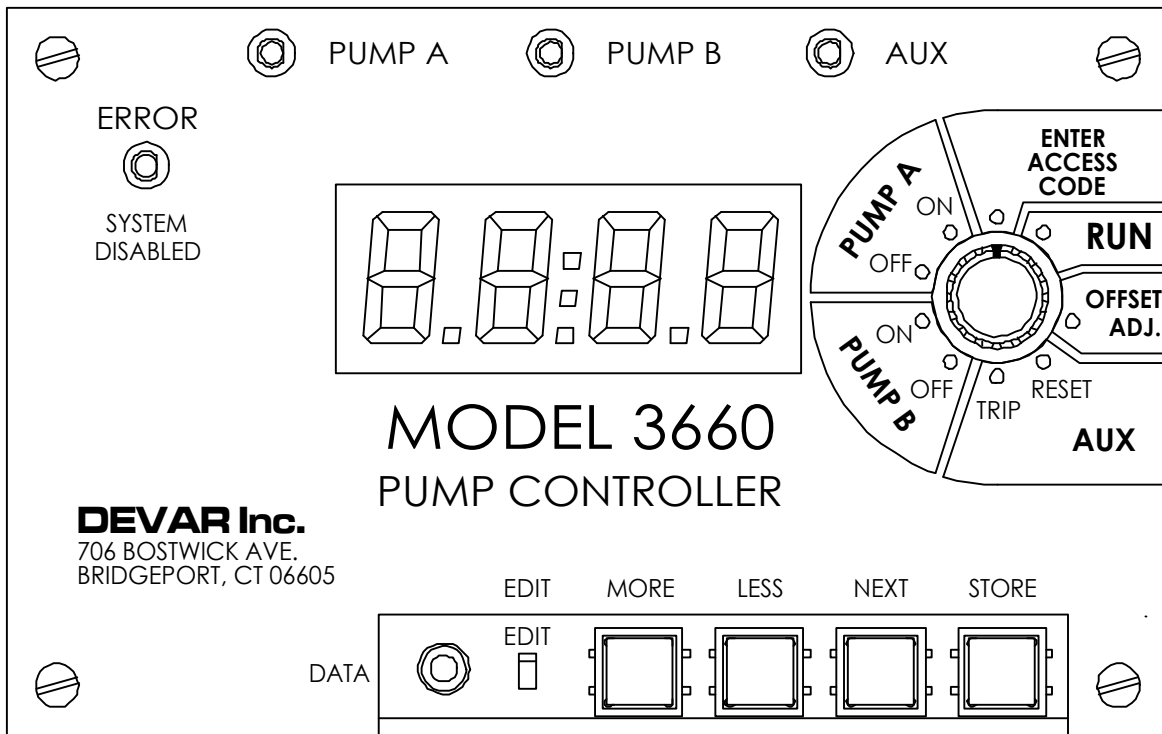


Figure 3: Control Parameters

#### 4.1 RUN

The display reads a value based on the input signal, the display scaling (section 3.1) and the offset (section 4.5). The rotary switch should normally be left in this position.

#### 4.2 ENTER ACCESS CODE

The access code is used to prevent unauthorized or unintentional modification of the PUMP A, PUMP B, AUX, and OFFSET points. The access code check can be disabled, refer to section 3.5.1. The factory default code is 0000.

Turn the rotary knob to ENTER ACCESS CODE. If the access code has been disabled the display reads OPEN, and the remaining instructions can be ignore. Proceed as desired. Otherwise, the display will read "0000" with the left digit flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Change the code to the desired value and press STORE. If the code is incorrect LOCd will be displayed. A correct code will be indicated with OPEN. The EDIT lamp will light and remain lit as long as the rotary switch is turned to any of the PUMP A, PUMP B, AUX or OFFSET positions. Editing is disabled as soon as anything else is displayed, such as by turning the switch to ENTER ACCESS CODE or RUN.

#### 4.3 PUMP A and PUMP B

The pump control operates by comparing the input signal value to the pump ON and OFF values. The control turns on and there is continuity between A and N when the input signal value reaches the ON point. The control remains on until the input signal value reaches the OFF point, at which time there is continuity between A and C.

The 3660 is configured as a pump up or a pump down controller simply by the setting of the ON and OFF points.

The control points can be modified only when the EDIT lamp is lit., refer to section 4.2. Turn the knob to the desired control point ( PUMP A ON, PUMP A OFF, PUMP B ON, PUMP B OFF, AUX TRIP, or AUX RESET). The current value of this setting is displayed with the left digit flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Change the display to the desired value. Press STORE and SAVE is displayed as confirmation, the 3660 is now operating with the new parameter.

Note that setting ON and OFF to the same value will cause that control to be disabled and force that relay to continuity between the A and C contacts. Disabling a control in this manner will not stop the effect of alternation. The “disabled” relay will activate when a working control alternates into it.

#### 4.4 AUX (required step)

AUX will be configured to be controlled in one of five methods described in sections 3.4.1 - 3.4.5. AUX acts as a pump control if either CtrlL or ALt was selected, which makes TRIP equivalent to ON, and RESET to OFF. Refer to sections 4.3 for instructions on modifying the control points.

#### 4.5 OFFSET ADJ. (required step)

The values entered at scale display (refer to section 3.1) are determined by the measurement range of the transmitter. The offset is directly added to the measurement range to shift the displayed values to some desired range.

Example:

A ten pound pressure transmitter is mounted in the outflow pipe of a tank several feet below the bottom of the tank. The desire is to indicate the height of water in the tank, measured in feet. The display is scaled for the measurement range of the transducer, which is 0.00 to 23.10ft. The tank water depth is measured at 10ft 2-1/2inches, or 10.21ft. The display reads 14.70ft. The measurement range needs to be offset by  $10.21 - 14.70 = -4.49$  to read the desired value.

## SPECIFICATIONS

### GENERAL

Power	90-140VAC 50/60Hz 90-140VAC or 190-250VAC 50/60Hz (switchable) 9.5-30 VDC
Operating Temperature	-20°C to 70°C
Overall Dimensions	80mm H x 140mm W x 26mm 3.15H x 5.52W x 1.03D
Weight	0.522Kg = 1.15lbs. = 18.4oz
Display	LCD four 7 segment digits with amber backlighting, 0.54 high
User Input	4 pushbuttons, rotary switch, 8 pole DIP switch
Loop Power Supply	24V, 25mA maximum with AC powered unit

### RELAY OUTPUTS

PUMP A, PUMP B, AUX Relay Rating	(3) SPDT (form C) relays; 10 amp 240VAC, 1/2 HP, 240 VAC 8 amps, 250VAC, 24VDC
ERROR relay rating	(1) SPDT relay, 150VDC/125VAC 1A
PUMP A, PUMP B relay operation	Relays energized (closure between A and O) when PUMP ON
AUX relay operation: ALM	Relays energized (closure between A and O) when reset
AUX relay op.: CTL, ALT, inSd, out	Relays energized (closure between A and O) when tripped

### INPUT

A/D converter	16 bit delta-sigma type
Reference	2.5V ±15ppm / °C typical
Voltage Input Impedance	1M Ohms
Current Input Impedance	20 Ohms + 2 diode drops
-3dB frequency	6 Hz.
Standard inputs	4/20mA (default), 0/20mA, 0/10V, 0/5V, and 1/5V available
Display update rate	3-1/3 Hz
Accuracy	± 0.05% of selected input
Displayable numeric range	-1999 to 9999 with decimal point
Display Scaling	define process values at minimum and maximum input signals

Note: As of 14 August 2003 , these preliminary specifications are subject to change

## FACTORY DEFAULT SETUP FOR 3660

### **Default Settings**

The various configurable settings are set as follows for new units.

Scale Display DP	123.4
Scale Display Min	000.0
Scale Display Max	277.2
Detect Input Failure Min	-20.0
Detect Input Failure Max	300.0
AUX Function	ALt
Access Code	0000
Pump A ON	040.0
Pump A OFF	020.0
Pump A ON	080.0
Pump A OFF	025.0
AUX TRIP	090.0
AUX RESET	030.0
Offset	000.0

Alternation is off and security code check is active.

All poles on DIP switches SW7, SW5 are OFF.

## FACTORY SETUP FOR 3660

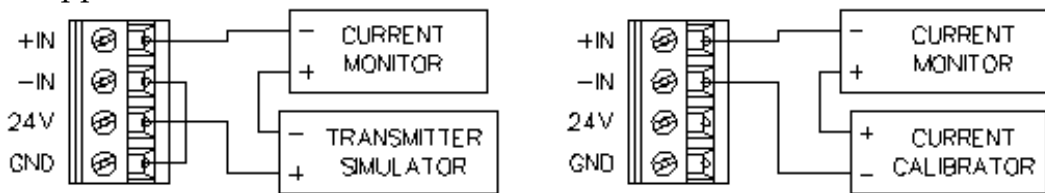
### Sampling an Input Signal

#### Required test equipment

- 1) Current calibrator or transmitter simulator able to source 4.000mA and 20.000mA  $\pm 0.5\mu\text{A}$ . The Devar 18-MSA is suitable.
- 2) Milliammeter able to resolve 1 $\mu\text{A}$  at 0.05% accuracy. A Keithley model 191 on the 2V range with a 10 Ohm 0.01% precision resistor current shunt is suitable.

#### Procedure

- 10) Power down the unit. Remove the wiring hatch. Note the input signal wiring, remove, and install the test equipment. One of the following two diagrams will be applicable.



- 20) Open the hinged front cover. Loosen the thumbscrews and remove the front panel. Put DIP switch SW7 poles 1 and 8 ON, which puts SELECTOR FUNCTION to SETUP and enables SAMPLE. Put the rotary switch on SAMPLE MIN. Power up the 3660. The "Setup Functions Active" and "EDIT" lamps are lit.
- 30) The rotary switch is on SAMPLE MIN. The "EDIT" lamp is lit. Apply 4.000mA to the input. By design, the display should indicate  $16.10 \pm 2.00$ . Press STORE when satisfied. SAVE is displayed to confirm the new value.
- 40) Put the rotary switch on SAMPLE MAX. The "EDIT" lamp is lit. Apply 20.000mA to the input. By design, the display should indicate  $80.48 \pm 5.00$ . Press STORE when satisfied. SAVE is displayed to confirm the new value.
- 50) Power down the unit and reconnect the original input signal wiring. Replace the wiring hatch. Put DIP switch SW7 the poles 1 and 8 OFF, which puts SELECTOR FUNCTION to Control and disables SAMPLE. Apply power. The "Setup Functions Active" and "EDIT" lamps are dark. Replace the front panel. Put the rotary switch on RUN. Close the front panel.

Input Span	0/20mA	4/20mA	0/5V	1/5V	0/10V
	Nominal A/D results at Sample Points				
Sample Minimum	0.00	16.10	0.00	18.25	0.00
Sample Maximum	80.48	80.48	91.23	91.23	91.23

## FACTORY SETUP FOR 3660

### Select the AUX Relay Control Method

- 10) Open the front cover and remove the front panel to access DIP switch SW7. Put DIP switch SW7 poles 1 and 5 ON, which puts SELECTOR FUNCTION to SETUP and enables Select AUX Funct. Turn the rotary knob to the SELECT AUX FUNCT position. The "Setup Functions Active" and "EDIT" lamps are lit.
- 20) Pressing NEXT will scroll through the methods CTL, ALT, ALM, inSd, and out. Press NEXT until CTL is displayed.
- 30) Press STORE to accept the entry. SAVE is displayed to confirm the new choice.
- 40) Put DIP switch SW7 the poles 1 and 5 OFF, which puts SELECTOR FUNCTION to CONTROL and disables Select AUX Funct. The "Setup Functions Active" and "EDIT" lamps are dark. Reinstall the front panel. Turn the rotary knob to the RUN position. Close the front cover.

### Scaling the Display

- 10) Open the front cover and remove the front panel to access DIP switch SW7. Put DIP switch SW7 poles 1 and 6 ON, which puts SELECTOR FUNCTION to SETUP and enables Display Scaling. The "Setup Functions Active" lamp is lit. The "EDIT" lamp will light when the rotary switch is turned to either SCALE DISPLAY DP, MIN, or MAX.
- 20) Turn the rotary knob to the SCALE DISPLAY DP (decimal point) position. The current selection is displayed. Press NEXT until the display indicates 123.4. Press STORE to accept the entry. SAVE is displayed to confirm the new choice.
- 30) Turn the rotary knob to the SCALE DISPLAY MIN position. The current value is displayed with the left digit flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Modify the indication on the display to read 000.0. Press STORE to accept the entry. SAVE is displayed to confirm the new value.
- 40) Turn the rotary knob to the SCALE DISPLAY MAX position. The current value is displayed. Modify the indication on the display to read 277.2 Press STORE to accept the entry. SAVE is displayed to confirm the new value.
- 50) Put DIP switch SW7 the poles 1 and 6 OFF, which puts SELECTOR FUNCTION to CONTROL and disables Display Scaling. The "Setup Functions Active" and "EDIT" lamps are dark. Reinstall the front panel. Turn the rotary knob to the RUN position. Close the front cover.

## FACTORY SETUP FOR 3660

### Set the PUMP A, B and AUX Control Points

- 10) Open the front cover and remove the front panel to access DIP switch SW7. Put DIP switch SW7 pole 3 ON, which sets the Security Check to IGNORE. Replace the front panel.
- 20) Turn the rotary switch to PUMP A ON. The "EDIT" lamp is lit.
- 30) The current value is displayed with the left digit flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Modify the indication on the display to read the value in the table below. Press STORE to accept the entry. SAVE is displayed to confirm the new value.
- 40) Repeat 30) for each of the six rotary switch positions values in the table below.

	PUMP A	PUMP B	AUX
ON / TRIP	36.0	048.0	060.0
OFF / RESET	006.0	006.0	006.0

- 50) Remove the front panel to access DIP switch SW7. Put DIP switch SW7 pole 3 OFF, which sets the Security Check to ACTIVE. Replace the front panel. Turn the rotary knob to RUN. Close the front cover.

### Edit the Access Code

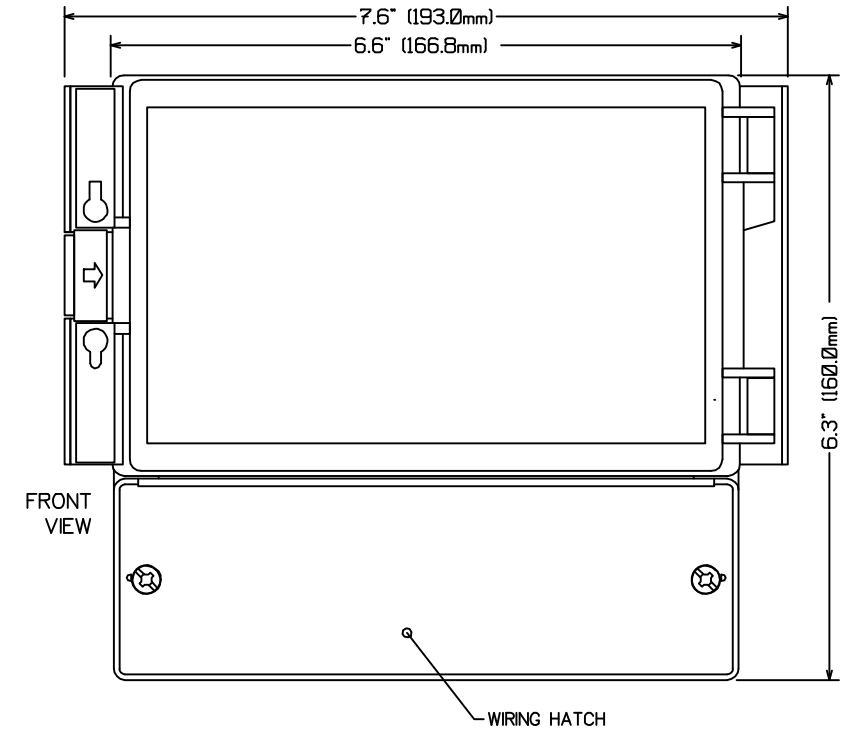
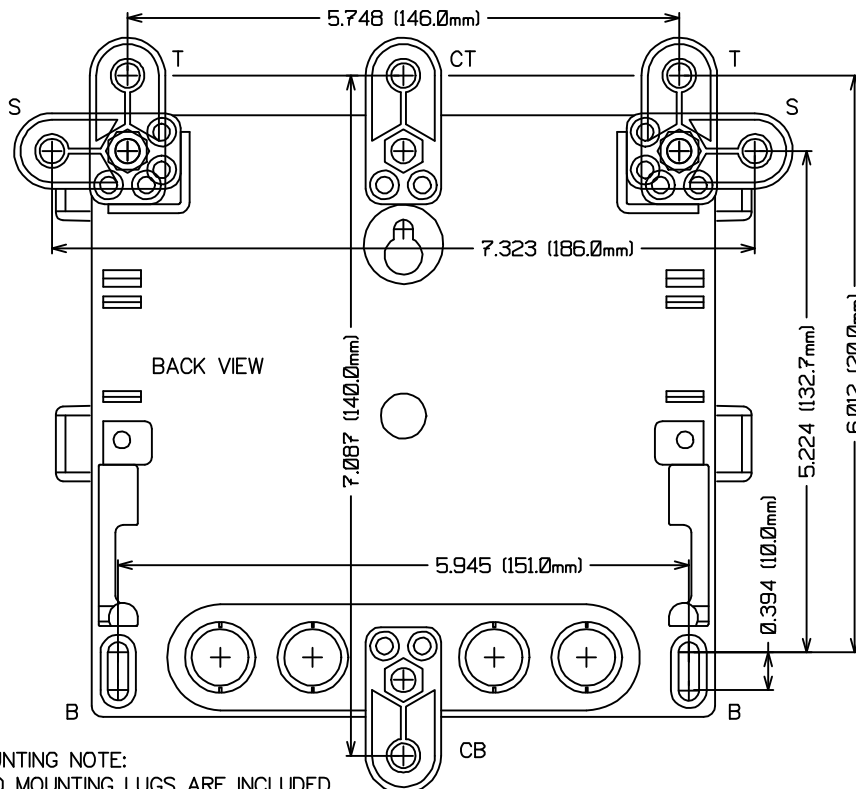
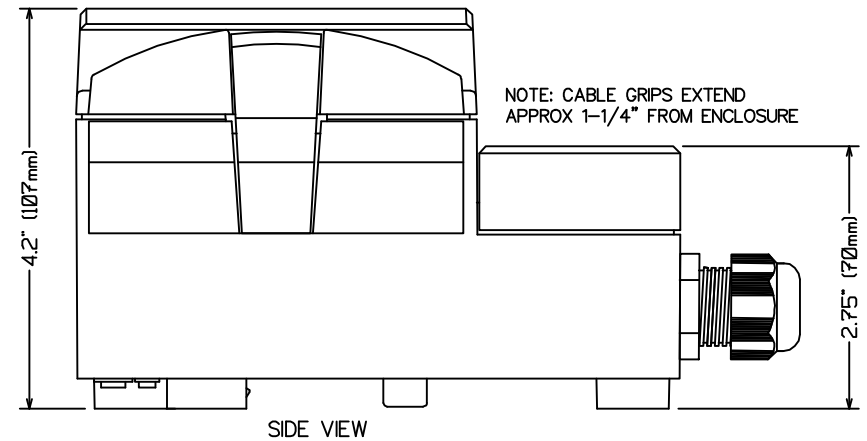
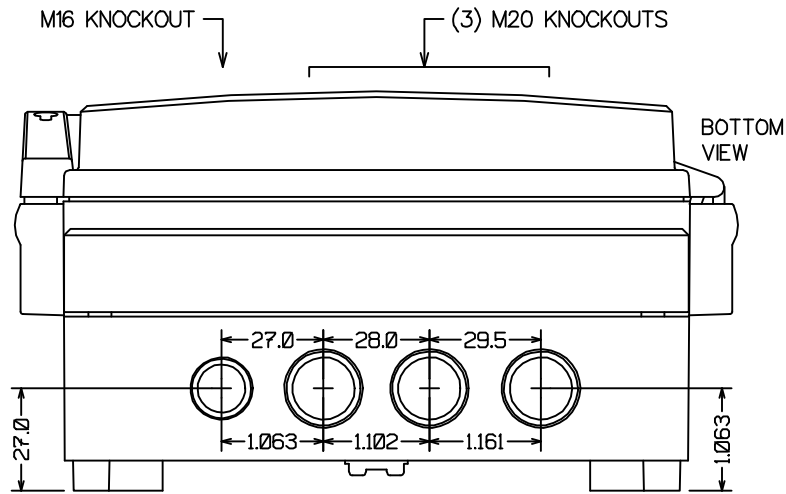
- 10) Open the front cover and remove the front panel to access DIP switch SW7. Put SW7 pole 1 ON, which puts which puts SELECTOR FUNCTION to SETUP. The "Setup Functions Active" lamp lights. Put SW7 poles 3 and 4 ON, which disables the security code check and enables editing the access code. Turn the rotary knob to EDIT ACCESS CODE and the "EDIT" lamp lights.
- 20) The current value is displayed with the left digit flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Modify the indication on the display to "0000". Press STORE to accept the entry. SAVE is displayed to confirm the new value.
- 30) Put DIP switch SW7 poles 1, 3, and 4 OFF, which puts SELECTOR FUNCTION to CONTROLS, enables the security code check, and disables editing the access code. The "EDIT" and "Setup Functions Active" lamps are dark. Replace front panel, turn the rotary switch to RUN. Replace front panel and close the display hatch.

## FACTORY SETUP FOR 3660

### Setup Transmitter Failure Detection

- 10) Open the front cover and remove the front panel to access DIP switch SW7. Put SW7 pole 1 ON, which puts which puts SELECTOR FUNCTION to SETUP. The "Setup Functions Active" lamp lights. Put SW7 poles 7 ON, which enables editing the detect input failure setting.
- 20) Turn the rotary knob to DETECT INPUT FAILURE MIN and the "EDIT" lamp lights. The current value is displayed with the left digit flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Modify the indication on the display to "-20.0". Press STORE to accept the entry. SAVE is displayed to confirm the new value.
- 30) Turn the rotary knob to DETECT INPUT FAILURE MAX and the "EDIT" lamp lights. The current value is displayed with the left digit flashing. Pressing MORE or LESS will change the value of the flashing digit. Pressing NEXT will change which digit flashes. Modify the indication on the display to "300.0". Press STORE to accept the entry. SAVE is displayed to confirm the new value.
- 40) Put DIP switch SW7 poles 1 and 7 OFF, which puts SELECTOR FUNCTION to CONTROLS and disables editing the detect input failure setting. The "EDIT" and "Setup Functions Active" lamps are dark. Replace front panel, turn the rotary switch to RUN. Replace front panel and close the display hatch.

REV	DESCRIPTION	DATE	APPROVED
A	RELEASE: ECN 3268	AUG 02	

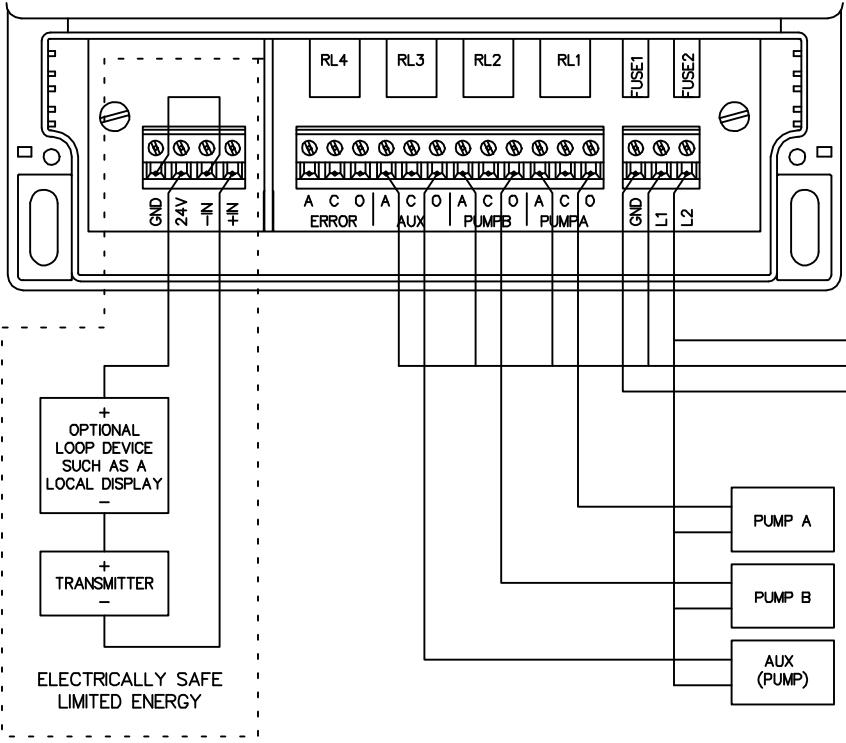


**MOUNTING NOTE:**  
 TWO MOUNTING LUGS ARE INCLUDED.  
 USE #10 OR 5MM HARDWARE  
 SELECT ONE OF THE FOLLOWING METHODS:  
 1) 4 POINT TOP. MOUNT LUGS AT T, USE LUG HOLES AND HOLES LABELED "B"  
 2) 4 POINT SIDE. MOUNT LUGS AT S, USE LUG HOLES AND HOLES LABELED "B"  
 3) 3 POINT. MOUNT LUG AT CT, USE LUG HOLE AND HOLES LABELED "B"  
 4) 2 POINT CENTERLINE. MOUNT LUGS AT CT AND CB, USE LUG HOLES

This Drawing is the sole property of DEVAR Inc. and is submitted on the understanding that the contents hereof are not published and are not to be disclosed to third persons without prior permission.	UNSPECIFIED DIMENSION TOLERANCE DECIMAL $\pm 0.005$ FRACTION $\pm 1/64$ ANGLE $\pm 1/2$ DEGREE		CONTRACT NO.		DEVAR Inc. 708 Boetwaf Avenue, Bridgeport, Conn. 06608 TEL: (203) 368-8781 FAX: (203) 368-3747	
	MATERIAL	-N/A-	PREPARED	SML		AUG 2002
	FINISH	-N/A-	CHECKED			
	NEXT ASSY NO. BM516542-AR		MECH			
		DESIGN			3660 GENERAL DIMENSIONS AND MOUNTING	
		APPROVED				
		APPROVED			SIZE C DRAWING NO. 516554 REV A	
					SCALE FULL WT SHEET 1 OF 1	

REV	DESCRIPTION	DATE	APPROVED
A	RELEASE: ECN 3268	JUN 02	

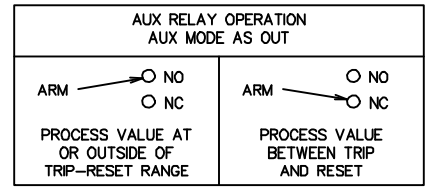
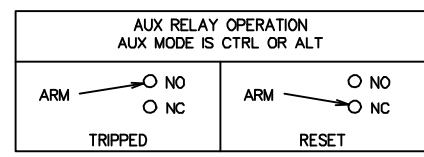
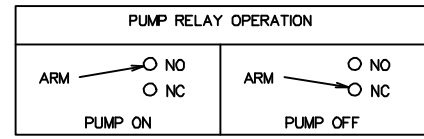
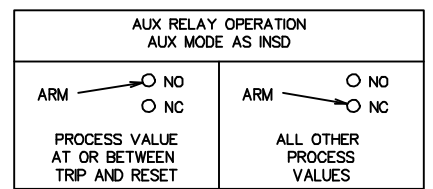
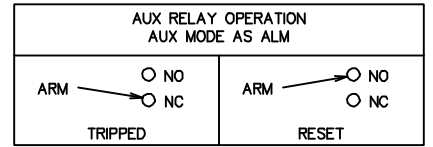
WIRING A TYPICAL APPLICATION WITH AUX CONTROLLING A THIRD PUMP AND AUX MODE SET AS EITHER CTL OR ALT.



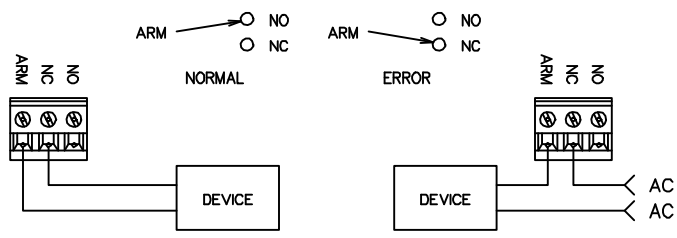
NOTES  
 1) RELAYS  
 WIRING TO RELAY "NO" AND "ARM" RESULTS IN OPEN CONTACTS ON LOSS OF CONTROLLER  
 WIRING TO TO RELAY "NC" AND "ARM" RESULTS IN CONTACT CLOSURE ON LOSS OF CONTROLLER  
 ALL RELAYS SPDT (FORM C) MAX. RATING:  
 8A@250VAC, 10A@240VAC,  
 8A@24VDC, 1/2HP@240 VAC  
 2) PUMPA, PUMPB, & AUX  
 WIRE PUMPS TO "NO" AND "ARM"  
 USE CONTACTOR IF PUMPS EXCEED RELAY RATING

AC L2  
 AC L1  
 GND

ELECTRICALLY SAFE LIMITED ENERGY



ERROR RELAY OPERATION



CONNECTING THE ERROR RELAY OUTPUT TO PROVIDE A CONTACT CLOSURE ON ERROR FOR A DEVICE SUCH AS A DIALER

CONNECTING THE ERROR RELAY OUTPUT TO POWER UP DEVICES ON ERROR, SUCH AS A HORN AND LAMP

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UNSPECIFIED DIMENSION TOLERANCE DECIMAL +/- 0.005 FRACTION +/- 1/64" ANGLE +/- 1/2 DEGREE	CONTRACT NO.		
	PREPARED	SMUL	JUN 02
MATERIAL -N/A-	CHECKED		
	MECH		
FINISH -N/A-	ELEC	SMUL	JUN 02
	DESIGN		
NEXT ASSY No. BM516541-01	APPROVED		
	APPROVED		

DEVAR Inc.		706 Bostwick Avenue, Bridgeport, Conn. 06605 TEL: (203) 388-6751 FAX: (203) 388-3747	
3660 WIRING DIAGRAM			
SIZE B	DRAWING NO. 516553	REV A	
SCALE FULL	WT	SHEET 1 OF 1	