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DESCRIPTION

The Model 330 is a compact, programmable relay control capable of converting the signal from a Badger Meter flow sensor into a flow switch.

With an onboard microcontroller and digital circuitry, the Model 330 is programmed with a Windows® based computer program. This eliminates the need to set dip switches or potentiometers and produces precise, accurate and drift free control of the relay outputs. In addition to accepting the Badger Meter square wave signal, the Model 330 can accept other pulse and sine wave inputs.

SCOPE AND PURPOSE

This manual provides instructions for installing and programming the Model 330 relay control.

DIMENSIONS

The compact cast epoxy body measures 1.75" (44 mm) x 2.75" (70 mm) x 1.5" (38 mm) and can easily be mounted to panels, DIN rails or enclosures. With multiple inputs, ease of use and a variety of enclosures, the Model 330 is a powerful, competitively priced relay control.

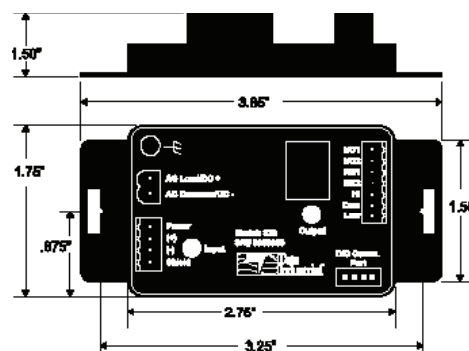


Figure 1: Dimensions

MECHANICAL INSTALLATION

The Model 330 can be surface mounted onto a panel, attached to DIN rails using adapter clips or wall mounted using two optional enclosures.

Location

Although the Model 330 device is encapsulated, all wiring connections are made to exposed terminals. The unit should be protected from weather and moisture in accordance with electrical codes and standard trade practices. In any mounting arrangement, the primary concerns are ease of wiring and attachment of the programming cable. The unit generates very little heat so no consideration need be given to cooling or ventilation.

Surface Mount Installation

The Model 330 can be mounted to the surface of any panel using double-sided adhesive tape or by attaching fasteners through the holes in the mounting flanges of the unit.

DIN Rail Mounting

Optional clips snap onto the mounting flanges allowing the Model 330 to be attached to DIN 15, 32, 35 mm DIN rail systems.

Wall Mounting

Optional metal and plastic enclosures are available to mount the Model 330 to a wall when no other enclosure is used. The enclosure is first attached to the wall using fasteners through its mounting holes.

After wiring, the transmitter can be attached to the enclosure with the terminal headers facing in using the slots in the mounting flanges. As an alternate mounting arrangement, the Model 330 can be fastened to the box cover using double-sided adhesive tape.

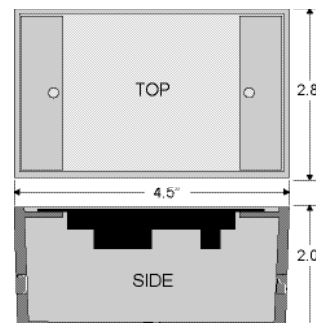


Figure 2: Optional enclosure dimensions

ELECTRICAL INSTALLATION

All connections to the Model 330 are made to screw terminals on removable headers.

Power Supply Wiring

The Model 330 requires 12-24 Volts AC or DC to operate. Power connections are made to the ORANGE header. The connections are labeled beside the header. Observe the polarity shown on the label.

If a Badger Meter plug-in type power supply (Model A-1026 or A-503) is used, connect the black/white striped wire to the terminal marked positive (+) and the black wire to the terminal marked negative (-).

NOTE: Included with every Model 330 is a Model 330IK kit containing a screw, lock washer and ground lead to connect the Model 330 to earth ground. This will help prevent electrical interference from affecting Model 330 normal operation.

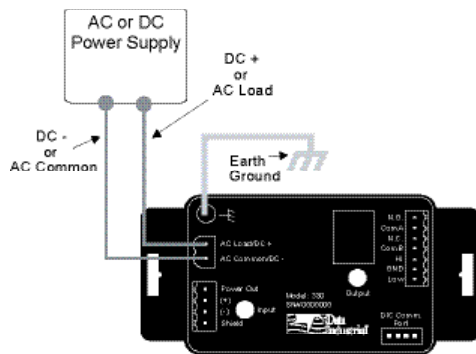


Figure 3: Sample power supply wiring diagram

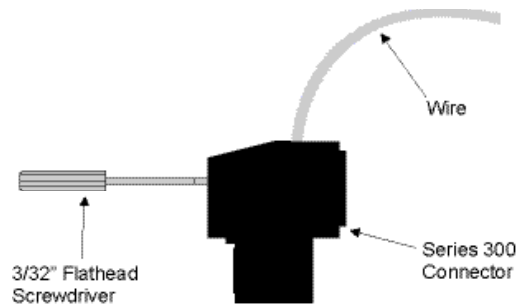


Figure 4: Side view removable connector wiring

Sensor Wiring

All flow sensor types connect to the four terminal header. See [Figure 5](#).

If the sensor is a **Model 200**:

- Connect the red wire of the Model 200 to Sensor signal (+) on the Model 330.
- Connect the black wire of the Model 200 to Sensor signal (-) on the Model 330.
- Connect the bare wire (if applicable) of the Model 200 to the Shield Terminal on the Model 330.

If the sensor is a **Model 4000**:

- Connect the red wire of the Model 4000 to Power on the Model 330.
- Connect the black wire of the Model 4000 to Sensor (-) on the Model 330.
- Connect the clear wire of the Model 4000 to Sensor (+) on the Model 330.
- Connect the bare wire of the Model 4000 to the Shield on the Model 330.

If the sensor is an **SDI** with standard frequency (pulse) output:

- Connect terminal 3 (sensor signal) of the SDI to Sensor (+) on the Model 330.
- Connect terminal 2 (sensor common) of the SDI to Sensor (-) on the Model 330.
- Connect the terminal 1 (shield) of the SDI to the Shield on the Model 330.

If the sensor is a not a Badger Meter flow sensor:

The sensor input power terminal supplies nominal 9.1V DC excitation voltage for 3 wire sensors. Connect sensor signal + and sensor signal - wires to the transmitter terminals.

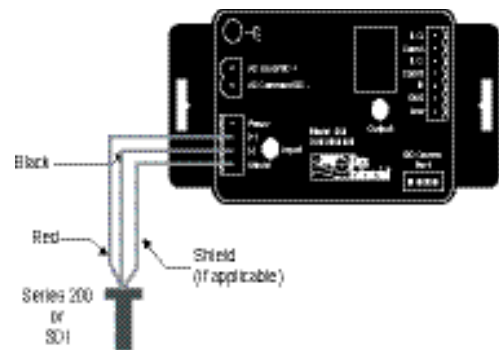


Figure 5: Sample sensor wiring

Relay Output Wiring

Model 330 is supplied with a removable DPST relay with normally open and normally closed contacts. To wire to the normally closed contacts, connect to the terminals NC1 and NC2. To wire to the normally open contacts, connect to the terminals NO1 and NO2.

NOTE: This relay can be used as a Form C relay. Use a jumper to connect one terminal from each set together as the common terminal.

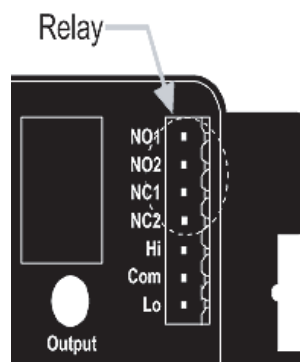


Figure 6: Relay location

Remote Reset Switch Wiring (if applicable)

The Hi, Com and Lo terminals on the Model 330 are used for a remote reset. If the remote reset device provides a momentary dry contact closure, connect to the Lo and Com terminals. If the remote reset device provides a momentary voltage (up to the supply voltage to the Model 330) connect to the “Hi” terminal.

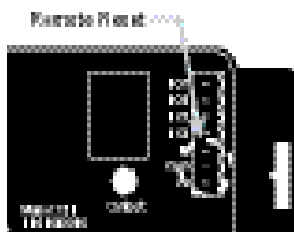


Figure 7: Remote reset location

Communications Cable Wiring

Field calibration requires a Model A330 Programming kit (consisting of a custom cable and software) and a PC running Windows 7, XP or Vista. To program, the Model 330 must be connected to power, and the A301 cable must be connected to the Model 330 Comm port connector and an available 9-pin port on the PC.

NOTE: The A301 cable will work with all Model 300 products. The older version of the cable—A300—does not have sufficient bandwidth to work with the Model 340 transmitters.

Badger Meter provides free programming software updates for all Model 300 devices. Go to www.badgermeter.com for these updates.

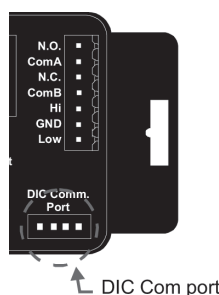


Figure 8: DIC Comm port location

PROGRAMMING

To program the Model 330, install the Badger Meter programming software on a computer (PC) and enter data on templates in the Windows based program.

1. Load the software onto the PC.
2. Connect the PC to the Model 330 transmitter by connecting the Model A-301 communications cable to the socket labeled "D.I.C Comm port", taking care to properly align the tab on the plug and socket to maintain polarity. Connect the DB9 connector of the Model A301 communications cable to a port on the same PC that has the software installed.
3. Connect the Model 330 transmitter to a power supply.
4. Open the software and select the appropriate Com port as shown in [Figure 9](#).
5. Open the Parameters screen.
6. Program using the example in [Figure 10](#) as a reference.



Figure 9: Select COM port

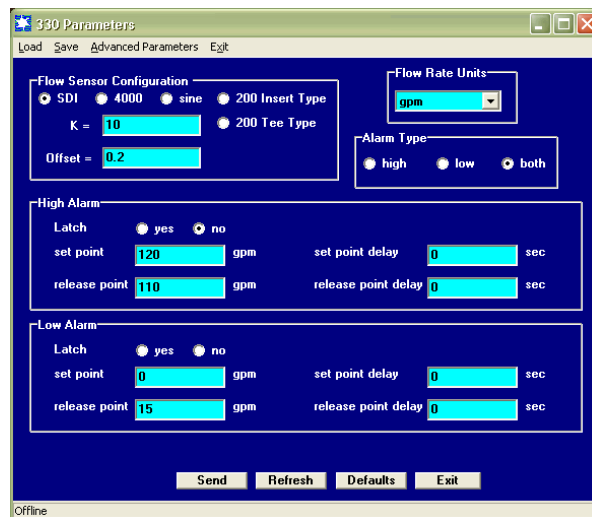


Figure 10: Parameters screen

Parameter Screen Definitions

High Alarm	A condition where if the flow rate exceeds the set point the relay is energized.
Low Alarm	A condition where if the flow rate drops below the set point the relay is energized.
Set Point	The flow rate that triggers the event. (For example, energize the relay.)
Release Point	The flow rate that de-energizes the relay.
Set Point Delay	A time interval in seconds between the point when the flow rate crosses the set point and the relay energizes.
Release Point Delay	A time interval in seconds between the point when the flow rate crosses the release point and the relay de-energizes.
Latch	A function that holds the relay in the energized state until reset even if the flow rate crosses the release point.
Remote Reset	Reset is the ability to interrupt all timing functions and return them to the initial programmed settings and/or de-energize the relay coil that has been latched as a result of an alarm function. This reset is accomplished by momentarily disconnecting the power supply or connecting an external device to the reset terminals.
Filter Coefficient	An averaging routine that smooths out unstable flow. The non-linear reference scale from 0...9 reference scale from 0...9 defaults to a value of 2. Do not change unless flow changes interfere with the control functions.

SPECIFICATIONS

Power			
Power Supply Options	12...28V AC RMS, 200mA max	12...40V DC, 100mA max	
Flow Sensor Input			
All Sensors	Excitation voltage 3 wire sensors: 9.1V DC 500Ω source impedance		
Pulse Type Sensors			
Signal Amplitude	2.5V DC threshold		
Signal Limits	Vin < 35V (DC or AC peak)		
Frequency	0...10 kHz		
Pull-up	2 kΩ		
Sine Wave Sensors			
Signal Amplitude	10 mV p-p threshold		
Signal Limits	Vin < 35V (DC or AC peak)		
Frequency	0...10 kHz		
Relay Rating			
DPST Contact Ratings	5A @ 30V DC	5A @ 125V AC	5A @ 250V AC
Time Delay	1...9999 second delay between flow point and relay actuation		
Transient Suppression	Designed to withstand a 5000 volt 1/2 microsecond, 100 kHz ring wave		
Sensor Calibration			
Badger Meter	Use K and Offset provided in sensor owner's manual		
Other Sensors	Check with factory		
Units of Measure			
Flow Measurement Rate	gpm, gph, l/sec, l/min, l/hr, ft3/sec, ft3/min, ft3/hr, m3/sec, m3/min, m3/hr		
Programming	Requires PC running Windows 7, XP or Vista		
Operating Temperature	-25...70° C	-20...158° F	
Storage Temperature	-40...85° C	-40...185° F	
Weight	4.8 oz. with headers installed		
Accessories	Model A-330 programming kit containing software and 3 feet Model A301 cable		
	Model A-330-20 programming kit containing software and 20 feet Model A301-20 cable (longer cable may be required for field programming)		

FACTORY DEFAULTS

	Default Value	Customer Value
Serial Number	n/a	
Version	n/a	
Sensor Type	Pulse	
K	1	
Offset	0	
Flow Rate Units	gpm	
Alarm Type	off	
High Alarm Latched	off	
High Alarm Set Point	120	
High Alarm Set Point Delay	5	
High Alarm Release Point	110	
High Alarm Release Point Delay	10	
Low Alarm Latched	off	
Low Alarm Set Point	10	
Low Alarm Set Point Delay	5	
Low Alarm Release Point	15	
Low Alarm Release Point Delay	10	
Filter Coeff	2	

Control. Manage. Optimize.

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