

Warranty Service and Repair

If for some reason your product must be returned for factory service, contact Dwyer Inc. to receive a Material Return Authorization number first, providing the following information:

1. Part Number, Serial Number
2. Name and telephone number of someone who can answer technical questions related to the product and its application.
3. Return Shipping Address
4. Brief Description of the Symptom
5. Brief Description of the Application

Once you have received a Material Return Authorization number, ship the product prepaid in its original packing to:

Dwyer
Highway 212 at 12
Michigan City, IN 46360

Please include the information about the malfunction with your product. This information enables our service technicians to process your repair order as quickly as possible.



Remote Relay Controller TDC Series Owner's Manual



Version 1.0
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SAFETY PRECAUTIONS

Step One

⚠ About This Manual:

PLEASE READ THE ENTIRE MANUAL PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on two different models of Remote Relay Controllers for Flow applications from Dwyer: TDC1 and TDC2. Many aspects of installation and use are similar between the two models.

⚠ User's Responsibility for Safety:

Dwyer manufactures several models of controller, with different mounting and switching configurations. It is the user's responsibility to select a controller model that is appropriate for the application, install it properly, perform tests of the installed system, and maintain all components.

⚠ Electrical Shock Hazard:

It is possible to contact components on the controller that carry high voltage, causing serious injury or death. **All power to the controller and the relay circuit(s) it controls should be turned OFF prior to working on the controller. If it is necessary to make adjustments during powered operation, use extreme caution and use only insulated tools. Making adjustments to powered controllers is not recommended.**

⚠ Flammable or Explosive Applications:

TDC series remote mount controllers should not be used with explosive or flammable liquids, which require an intrinsically safe rating. If you are unsure of the suitability of a controller for your installation, consult your Dwyer representative for further information.

⚠ Install In a Dry Location:

The controller housing is not designed to be immersed. It should be mounted in such a way that it does not come into contact with liquid. Its case is made out of PP (polypropylene). Refer to an industry reference to ensure that compounds that may splash onto the controller housing will not damage it. Such damage is not covered by the warranty.

⚠ Relay Contact Rating:

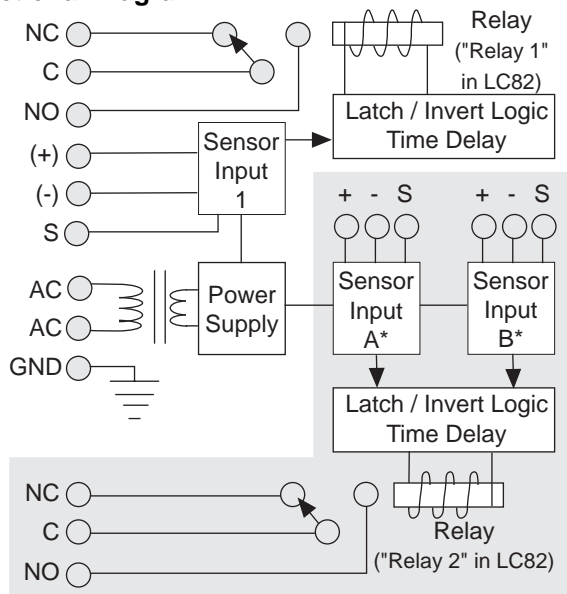
The relay is rated for a 10 amp resistive load. Many loads (such as a motor during start-up or incandescent lights) are reactive and have an inrush current characteristic that may be 10 to 20 times their steady-state load rating. The use of a contact protection circuit may be necessary for your installation if the 10 amp rating does not provide an ample margin for such inrush currents.

SPECIFICATIONS

Step Two

Supply voltage:	120 / 240 VAC, 50 - 60 Hz.
Consumption:	5 Watt
Sensor supply:	13.5 VDC @ 100 mA
Relay type:	TDC1: (1) SPDT TDC2: (1) SPDT, (1) Latched SPDT
Relay load:	250 VAC, 10A, 1/2 hp.
Relay mode:	Selectable, NO or NC
Time delay:	0 to 60 seconds
LED indication:	Sensor, relay & power status
Fail safety:	Power fail-safe
Temperature range:	F: -40 to 158 C: -40 to 70
Enclosure rating:	Panel or 35 mm DIN Rail (EN 50 022)
Enclosure material:	Polypropylene (U.L. 94 VO)
Certificate number:	LR 79326-3 (CSA/NRTL)

Functional Diagram



Part Number Information:

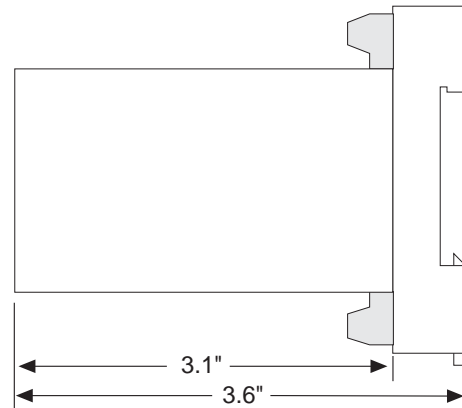
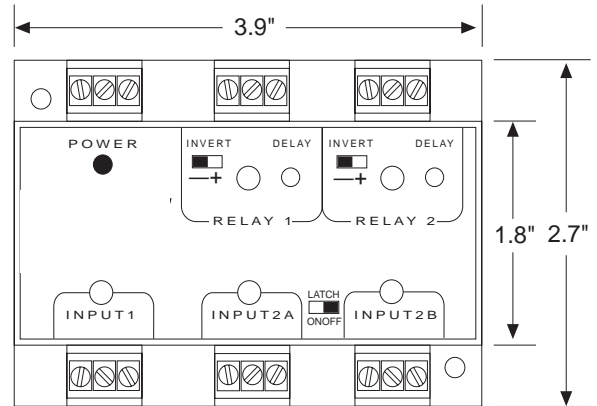
Part #	Mat'l	Description
TDC1	PP	Flow/No-Flow Controller
TDC2	PP	Dual Flow/No-Flow Controller

Make a Fail-Safe System:

Design a fail-safe system that accommodates the possibility of relay or power failure. If power is cut off to the controller, it will de-energize the relay. Make sure that the de-energized state of the relay is the safe state in your process. For example, if controller power is lost, a pump will turn off if it is connected to the Normally Open side of the relay.

While the internal relay is reliable, over the course of time relay failure is possible in two modes: under a heavy load the contacts may be "welded" or stuck into the energized position, or corrosion may build up on a

Dimensions



Approval Label

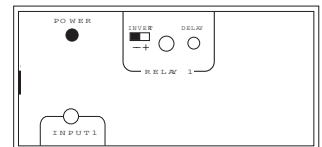
LR79326 -3

Power Supply
120/240 VAC, 50 - 60 Hz
5 Watt

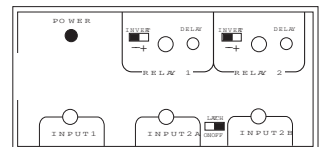
Maximum Relay Rating
250 VAC, 10 A, 1/2 Hp

Refer to the instruction manual for installation instructions.

TDC1 Faceplate



TDC2 Faceplate



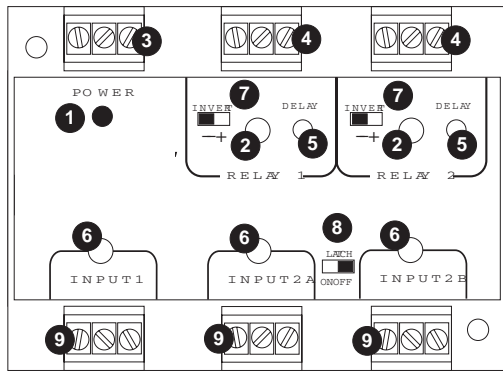
contact so that it will not complete the circuit when it should. In critical applications, redundant backup systems and alarms must be used in addition to the primary system. Such backup systems should use different sensor technologies where possible.

While this manual offers some examples and suggestions to help explain the operation of Dwyer products, such examples are for information only and are not intended as a complete guide to installing any specific system.

GUIDE TO CONTROLS

INSTALLATION

Step Three

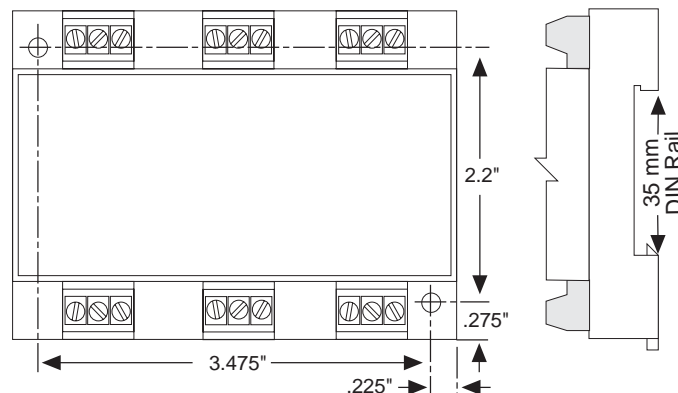


- 1. Power indicator:** This green LED lights when AC power is ON.
- 2. Relay indicator:** This red LED will light whenever the controller energizes the relay, in response to the proper condition at the switch input and after the time delay.
- 3. AC Power terminals:** Connection of 120 VAC power to the controller. The setting may be changed to 240 VAC if desired. This requires changing internal jumpers; this is covered in the Installation section of the manual. Polarity (neutral and hot) does not matter.
- 4. Relay terminals (NC, C, NO):** Connect the device you wish to control (pump, alarm etc.) to these terminals: supply to the COM terminal, and the device to the NO or NC terminal as required. The switched device should be a noninductive load of not more than 10 amps; for reactive loads the current must be derated or protection circuits used. When the red LED is ON and the relay is in the energized state, the NO terminal will be closed and the NC terminal will be open.
- 5. Time delay:** Use potentiometer to set delay from 0.15 to 60 seconds. Delay occurs during switch make and switch break.
- 6. Input indicators:** Use these LEDs for indicating Flow or No-Flow status of switch. For NC wiring, an Amber LED indicates No-Flow and no LED indicates Flow. For NO wiring, an Amber LED indicates Flow and no LED indicates No-Flow.
- 7. Invert switch:** This switch reverses the logic of the relay control in response to the switch: conditions that used to energize the relay will now de-energize the relay and vice versa.
- 8. Latch switch (TDC):** This switch determines how the relay will be energized in response to the two sensor inputs. When LATCH is OFF, the relay responds to switch Input 2A only; when LATCH is ON, the relay will energize or de-energize only when both switches (2A and 2B) are in the same condition (Flow or No-Flow). The relay will remain latched until both switches change conditions.
- 9. Input terminals:** Connect the switch wires to these terminals: Note the polarity: (+) is a 24 VDC, 50 mA power supply (connected to the red wire of a Dwyer flow switch), and (-) is the common ground path from the switch (connected to the black wire). Also, the (S) is a 14 VDC, 25 mA supply (connected to the white wire). If polarity between the red and black wires is reversed, the switch will change from NC to NO.

Step Four

Panel DIN Rail Mounting

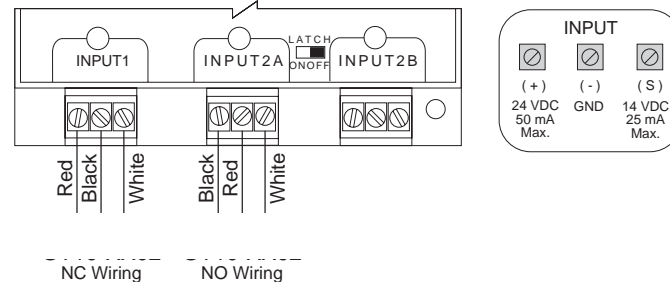
The controller may be mounted by either a back panel using two screws through mounting holes located at the corners of the controller or by snapping the controller on 35 mm DIN Rail.



Note: Always install the controller in a location where it does not come into contact with liquid.

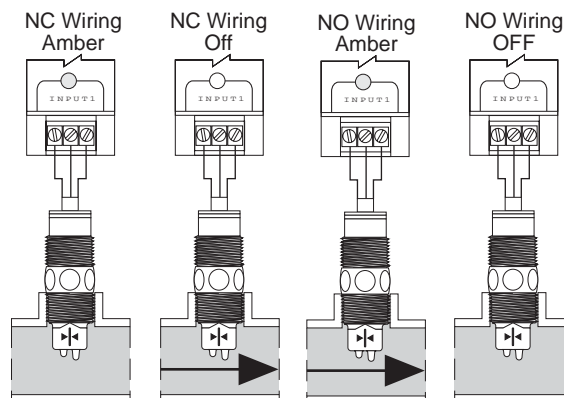
Connecting switches to input terminals:

Please note a difference between Dwyer flow switches (N-channel and P-channel). Use only the N-Channel switches with the TDC series of controller. Wire the Red wire to the (+) terminal and the Black wire to the (-) terminal. Wire the White wire to the (S). See the illustration below to indicate wiring for your switch. Reversing Red and Black wire will change switch from NC to NO. Note: connect the Shield wire on the Flow switch to the GND terminal if required.



LED Indication

Use LED's located above the input terminals to indicate whether the switch is in a Flow or No-Flow state. With the flow switch wired NC, the Amber LED indicates No-Flow and no LED indicates flow. Wiring the switch NO (reversing the Red and Black wires), the Amber LED indicates Flow and no LED indicates No-Flow.

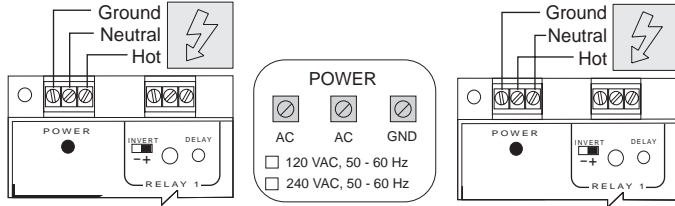


INSTALLATION

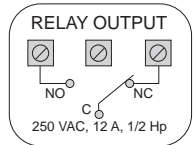
Step Five

VAC Power Input Wiring

Note: Polarity does not matter with the AC input terminal

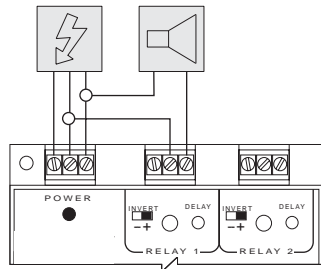


Relay Input Wiring

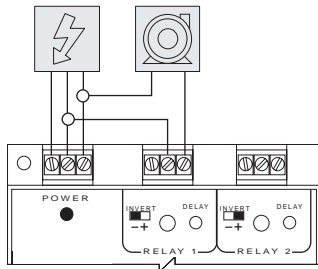


The controllers use dry contact Single Pole Double Throw (SPDT) relays rated at 250 Volts AC, 10 Amps, 1/2 Hp. The terminals are labeled Normally Open (NO), Common and Normally Closed (NC). Below shows four examples of basic wiring:

Alarm Contact @ No-Flow

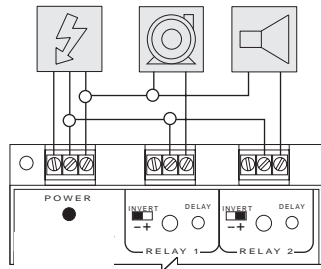


Pump Open @ No-Flow

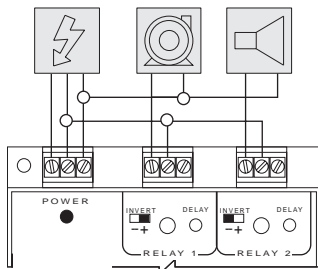


Note: The invert is switched between the Alarm and Pump Wirings.

Normally Open Relay Wiring



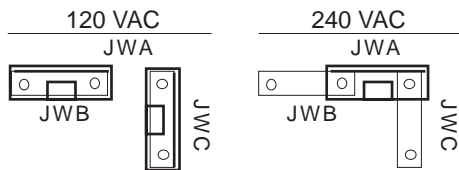
Normally Closed Relay Wiring



Note: The invert is switched changes between Normally Open and Normally Closed.

Changing from 120 to 240 VAC

Remove the back panel of the controller and gently slide the printed circuit board from the housing. Use caution when removing the PCB. Located jumpers JWA, JWB and JWC on the PCB. To change to 240 VAC, remove jumpers from JWB and JWC and place a single jumper across JWA. To change to 120 VAC, remove jumper JWA and place jumpers across JWB and JWC.



TROUBLESHOOTING

Step Six

Controller Logic

For all controllers, please use the following guide to understand the operation of the Dwyer TDC1/TDC2 controllers.

1. Make sure the Green power LED is On when power is supplied to the controller.
2. For NC switch wiring, the input LED's on the controllers will be Amber when the switch reads No-Flow and Off when the switch reads Flow.
3. The input LED will always respond to its corresponding relay LED. With invert Off, the relay LED will be On when the input LED is On and Off when the input LED is Off. With invert On, the relay LED will be Off when the input LED is On and On when the input LED is Off.
4. The relay may be wired either NO or NC. The normal state of the relay is when its LED is Off. With the LED On, the relay is in the energized mode and all terminal connections are reversed.
5. TDC model only, Latch ON operation: When both input LED's are ON, the relay will be energized (red LED On). After that, if one switch input turns Off, the relay will remain energized. Only when both switch LED's are Off will the controller de-energize the relay. The relay will not energize again until both switch LED's are ON. Reversing Invert switch will reverse logic. See the Logic Chart below for further explanation.

Relay Latch Logic Chart

Invert Off			Latch Off			Invert ON			Latch Off		
—	+		On	Off		—	+		On	Off	
Input A	InputB	Relay	Input A	InputB	Relay	Input A	InputB	Relay	Input A	InputB	Relay
ON	No Effect	ON	ON	No Effect	Off	ON	No Effect	Off	ON	No Effect	Off
OFF	No Effect	OFF	OFF	No Effect	On	OFF	No Effect	On	OFF	No Effect	On
Invert Off			Latch ON			Invert ON			Latch ON		
—	+		On	Off		—	+		On	Off	
Input A	InputB	Relay	Input A	InputB	Relay	Input A	InputB	Relay	Input A	InputB	Relay
ON	ON	ON	ON	ON	Off	ON	ON	Off	ON	ON	Off
OFF	ON	No Change	OFF	ON	No Change	OFF	ON	No Change	OFF	ON	No Change
ON	OFF	No Change	ON	OFF	No Change	ON	OFF	No Change	ON	OFF	No Change
OFF	OFF	OFF	OFF	OFF	On	OFF	OFF	On	OFF	OFF	On