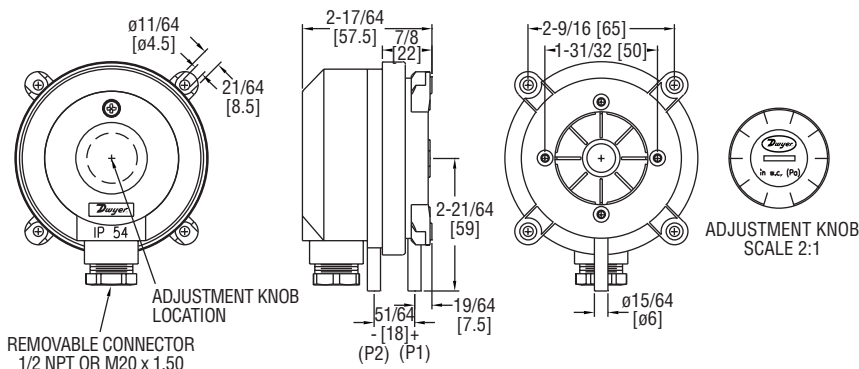




## Series BYDS Bypass Damper Switch

### Specifications - Installation and Operating Instructions



The Series BYDS Bypass Damper Switch is designed to control motorized bypass dampers. As individual zone dampers open and close, the system static pressure will rise and fall. In order to maintain proper airflow and static pressure through the HVAC system, a bypass system incorporating a floating type motorized damper and a static pressure control should be incorporated. A typical on/off pressure switch cannot operate in this application due to the high cycle rate that would result, eventually causing contact burn-out. The BYDS static pressure control is equipped with a solid-state switching and timing circuit to enhance operation and improve long-term reliability in this demanding application.

#### CONTROL OPERATION

The BYDS Bypass Damper Switch is designed for use with a three wire floating point damper actuator used to control the static pressure on zone control systems requiring motorized bypass dampers. A bypass damper, bypasses air from the discharge air side of the HVAC unit back in the return air side. The air flow is modulated in order to maintain a constant static pressure in the system as individual zone dampers open and close. The static pressure control is equipped with solid-state switching which dramatically increases the life of the control. On an increase in static pressure the BYDS will send 24 volts out on terminal three (3) and start the actuator to drive open. (See Terminal Designations Diagram). When the static pressure reaches set-point the actuator will stop. After a ten second delay the actuator will start to drive the damper closed if there has not been an increase in static pressure. A green LED indicates when the damper is in the open position or being driven open. A 24 VAC transformer is required to power the BYDS control and damper actuator. Wiring is made directly to terminals located behind the removable front cover. The unit includes tubing and two static pressure probes.

#### SPECIFICATIONS

**Service:** Air and non-combustible, compatible gases.

#### Materials:

Diaphragm material: Silicone;

Housing material: Switch body: PA 6.6 and POM;

Cover: Polystyrene.

**Temperature Limits:** Process ambient temperature from 32 to 122°F (0 to 50°C).

**Pressure Limits:** Max. operating pressure: 40 in w.c. (10 kPa) for all pressure ranges.

**Switch Type:** Single-pole double-throw (SPDT).

**Electrical Rating:** 1A @ 24 VAC.

**Electrical Connections:** Screw terminal block. M20 x 1.5 with cable strain relief or 1/2" NPT connection.

**Process Connections:** 5/16" (7.94 mm) outside diameter tubing, 1/4" (6.0 mm) inside diameter tubing.

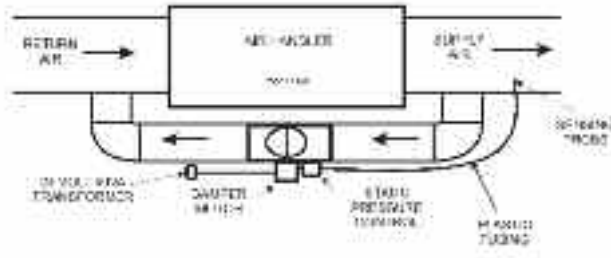
**Mounting Orientation:** Vertically, with pressure connections pointing downwards.

**Mechanical Working Life:** Over 10<sup>8</sup> switching operations.

**Weight:** 5.6 oz (160 g).

**Enclosure Rating:** NEMA 13, IP54.

## INSTALLING THE BYPASS DAMPER AND STATIC PRESSURE CONTROL ASSEMBLY



The bypass damper should be installed with the bypass air being discharged into the return air plenum (or above the ceiling if this area is used as a common return). The static pressure control should be installed so that the diaphragm is in the vertical position. The high pressure side of the static pressure control should be connected to the static sensing probe and inserted in the main supply plenum, downstream of the bypass damper and at least 3 feet from the air handling unit in a straight section of duct at the center line. The sensing probe is connected to the pressure control with 3/8" O.D. plastic tubing. The sensing probe should be inserted and sealed into the duct.

### MOUNTING BYPASS DAMPER SWITCH

First check the pressure switch to ascertain whether any damage is visible on the housing. If the housing is leaky because of damage, the pressure switch must not be used. Switching pressure specifications apply to vertical installation which is also the recommended position with pressure connections pointing downwards. Only if there is no potential for condensate forming can you mount the pressure switch horizontally. In this case, however, the switching values are approximately 0.08 in. w.c. (20 Pa) higher as indicated on the scale. In the horizontal position, the pressure switch should be mounted 'lying down' only, that is to say with the electrical connections pointing upwards. Do not mount the pressure switch in a hanging position (that is to say, not 'overhead' with the electrical connections pointing downwards). Otherwise the device will function inaccurately.

### Mounting with Screws or Brackets

1. To mount the pressure switch, L-shaped A-288 and S-shaped A-289 mounting brackets can be ordered separately. To secure the device on the rear side of the housing, only use the sheet metal screws (3.5 x 8 mm) which are supplied together with the mounting brackets. Under no circumstances must you use longer screws. Otherwise, the base of the housing could be punctured resulting in the pressure switch leaking.
2. Alternately you can also use the snap-on brackets - to remove it pull upwards.
3. You can also mount the pressure switch directly on a wall. To do this use screws with a maximum diameter of 0.315 in. (8.0 mm), if you use the outer mounting lugs to screw the device in place. Do not tighten the screws so much that the base of the device is deformed. Otherwise, the pressure switch can be shifted out of position, or leak.

### Installing Hoses

Important: Pressure tubing cannot be kinked. Pay particular attention to this point if you run hoses over an edge. It is better to form a loop. If the hoses are kinked, the device cannot function accurately.

- a) For connection to the pressure switch two fittings inherent in the housing are provided for hoses with an internal diameter of 1/4" (6.0 mm).
  1. Connect a hose with the higher pressure to socket P1 which is located on the lower section of the housing.
  2. Connect a hose with the lower pressure to socket P2 which is located on the middle section of the housing. After you have installed the hoses, it is absolutely essential to check them for tightness of fit at the connection points, and to make sure that they run without any kinks.

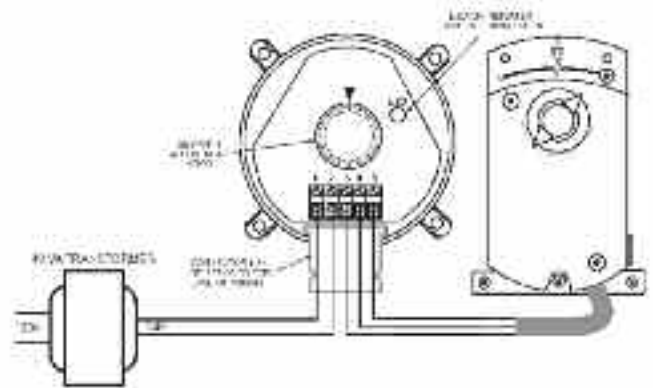
### Electrical Connection

Work on electrical installations must only be carried out by electricians who are specifically trained for this purpose.

**CAUTION** First make sure that there is no voltage on the connecting cable while you are working on the electrical connections. Otherwise, a possible electric shock may result and the connected equipment may be damaged.

- a) The connecting cable can be run to the pressure switch from three sides, according to choice. The screw cable connection has a plug-in design for this purpose. The seal in the screw cable connection is designed for cables with alternative sheath diameters of 0.275" (7 mm) or 0.393" (10 mm). Only use these sizes – otherwise the screw cable connection cannot seal adequately.
  1. If using a 0.275" (7 mm) connecting cable, you can line up the press nut, the plain washer and the sealing ring directly on the cable.
  2. If using a 0.393" (10 mm) connecting cable, you must first break the inner rubber ring out of the sealing ring directly on the cable. Then line up the press nut, the plain washer and the sealing ring on the cable.

### TERMINAL DESIGNATIONS



- 1 = 24 Volt (Hot)
- 2 = 24 Volt (Common)
- 3 = Actuator (Normally Open)
- 4 = Actuator (Common)
- 5 = Actuator (Normally Closed)

### ADJUSTING THE BYDS

Make absolutely certain that there is no voltage on the electrical connections before you carry out any setting on the pressure switch.

1. Confirm that the HVAC system has been properly balanced.
2. Confirm that all zone dampers are in the open position.
3. Confirm that the bypass damper is in the closed position.
4. Confirm that the fan is running.
5. Use the setpoint adjustment knob to set the static pressure by aligning with the arrow.

### MAINTENANCE

Upon final installation of the Series BYDS Bypass Damper Switch, no routine maintenance is required. A periodic check of system calibration is recommended. The Series BYDS is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.