FAN CONTROLS

ZPR-2

Constant Pressure Fan Controller (P/N 28 655)

INSTALLATION
OPERATION
MAINTENANCE

READ AND SAVE THESE INSTRUCTIONS

ZPR-2 MODEL

GENERAL

The American Aldes ZPR-2 Zone Pressure Regulator is a compact, TRIAC-based fan and motor control designed for HVAC, electronics, and industrial controls markets. The ZPR-2 can automatically control most single-phase AC fans and motors used in exhaust ventilators, duct fans, and blowers. The ZPR-2 regulates motor speed from a pressure transducer or flow transducer. It has automatic voltage and frequency detection and current ratings up to 7.5A. The 6" x 11" job-box mount makes this microprocessor-based design extremely flexible and economical. The benefits of using the ZPR-2 include acoustical noise reduction, pressure or flow regulation, greater system reliability, increased fan life, improved safety, and energy savings.

FEATURES

- Controls fan/motor speed based on on-board pressure transducer
- Power source: 95-250VAC, automatically detetected
- Frequency: 47-64Hz, automatically detected
- Fan On/Off threshold selectable by DIP switch
- AC Motor Type Compatibility: PSC or Shaded Pole, automatically detected
- Full voltage start pulse
- c UL us recognized to UL508, CSA-C22.2, File E100344
- Current ratings: 2.5A to 7.5A (at 40 °C still air)
- Connections: 18 AWG wires
- 10 selectable pressure settings
- Selectable idle speeds

INSTALLATION

If possible, install the ZPR-2 near the fan. In some cases, the fan may be mounted in a remote location where access is possible but difficult. In that case, the ZPR-2 should be installed in a readily accessible mechanical space, so that field adjustments can be made to the operating pressure if it is necessary to change the pressure to ensure proper airflows at the exhaust or supply grille locations. More extensive ductwork may require higher pressure levels. If the ducting system includes Zone Register Terminals (ZRT®), the pressure should not exceed 0.8 in. w.g., the maximum level for proper operation of the ZRTs.

ELECTRICAL CONNECTIONS

It is recommended that an adequately sized circuit breaker be connected between the power service and the control to permit fail-safe removal of power before making adjustments or connections. Connect line power (white) to location N. Connect line power (black) to location L. Secure any ground (green) wire to a steel electrical box or consult local electrical codes.

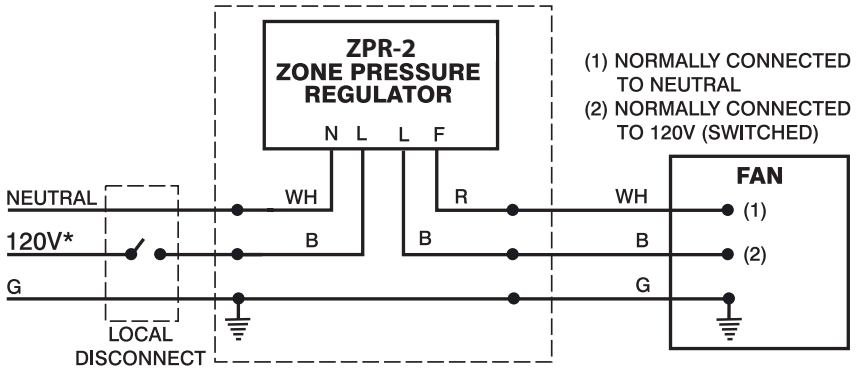
For a typical fan, expect a voltage drop to the fan of about 2-4% at full voltage.

Drill a 13/32"-7/16" diameter hole in the duct or plenum where the pressure is to be controlled. Avoid locations with high turbulence, such as within five diameters downstream of an elbow, wye, or reducer. Insert the pressure tap and tighten the nut from the inside, if accessible. If the interior is not accessible, drill the hole slightly smaller, so the nylon threads can fit tightly in the hole. Connect the 1/8" ID tubing to the pressure taps on the ZPR-2 and the connector on the duct or plenum.

***Note:** The internal pressure-tap connections to the pressure transducer on the circuit board are made with 1/16" ID tubing. Two taps are provided. Either may be used for positive or negative pressure. The internal software converts the pressure difference to an absolute value, so it is not necessary to be concerned about which is positive or negative. In an application where it is desired to maintain constant airflow, despite changes in the duct resistance (such as filter clogging), both taps may be used to monitor and maintain constant velocity pressure (constant airflow).*

WARNING! DANGEROUS VOLTAGES ARE PRESENT ON THE CIRCUIT BOARD WHEN CONNECTED TO THE POWER LINE. POWER MUST BE REMOVED BEFORE MAKING ANY CONNECTIONS OR ADJUSTMENTS TO AVOID ELECTRICAL SHOCK OR DAMAGE TO THE UNIT.

ZPR-2 WIRING



120V imput may be:

1. Direct from house circuit breaker (in the case of continuous ventilation)
2. Roller switches in ZRT Register Boxes
3. Parallel-wired switches in multi-port exhaust fans
4. Continuous or intermittent output of ZTC Control Module

OPERATION

With the exception of the "fixed speed mode", the ZPR-2 will not recognize any changes in switch or jumper settings that are made with power applied. Power must be turned OFF before changing any switch or jumper settings.

Some fans that run fine at lower voltages will not start at these voltages; therefore, the ZPR-2 will start fans at full voltage for 2 seconds before throttling back to the appropriate control speed. Set desired pressure level by setting DIP switches 1, 2, 3, and 4. The factory default setting is 0.6 in. w.g. **(See Table 1).**

TABLE 1 - PRESSURE CONTROL DIP SWITCH SETTINGS

Inches H_2O	DIP Switch Settings			
	1	2	3	4
0.1	ON	OFF	OFF	OFF
0.2	OFF	ON	OFF	OFF
0.3	OFF	OFF	ON	OFF
0.4	OFF	OFF	OFF	ON
0.5	ON	OFF	OFF	ON
0.6	OFF	ON	OFF	ON
0.7	OFF	OFF	ON	ON
0.8	ON	OFF	ON	ON
0.9	OFF	ON	ON	ON
1.0	ON	ON	ON	ON

When operating in pressure-control mode, fans will run at the speed necessary to hold the selected pressure **(See Table 1)**. Running some fans at very low voltages, however, can cause over-heating or stalling. Thus, it is recommended that a minimum or idle voltage be selected for each application using switches 5 and 6 **(See Table 2)**. Contact the fan or motor manufacturer, or American Aldes customer service, for help in determining minimum controllable voltages. The factory default setting is 30%.

If the fan tends to oscillate, changing switches 7 and 8 from the default position will slow down the controller response time and will help dampen any oscillations. Change switches 7 and 8 if oscillations are noticeable or easily induced, i.e. by opening and closing dampers in air-handling ducts, doors in pressure-controlled rooms, etc. Power down the controller and change switches 7 and 8 to the next longer delay time **(See Table 3)**. Then re-apply power and determine if improvement is sufficient. Repeat until oscillation is gone. Contact customer service if oscillation persists. The factory default is 2.5 times per minute.

FIGURE 2 - IDLE SPEED DIP SWITCH SETTINGS

% of Supply Voltage	DIP Switch	
	5	6
30%	ON	OFF
40%	OFF	ON
50%	OFF	OFF
60%	ON	ON

The amount of electrical noise emitted by the ZPR-2 increases as fan speed decreases. The amount of noise emitted is fan dependant. If the electrical noise is an issue, an AC Input Line Filter can be used. Aldes recommends the following line filters from www.filterconcepts.com or equivalent.

The ZPR-2 may be operated above 40 °C; however, the maximum current ratings will decline according to **Figure 1.** If installed in an attic, the temperature may exceed 40 °C.

TABLE 3 - LOOP RESPONSE TIME SWITCH SETTINGS

Amount	DIP Switch	
	7	8
Minimum	OFF	OFF
1.5X Min.	ON	OFF
2.5X Min.	OFF	ON
4.0X Min.	ON	ON

ACCESSORIES

Additional tubing is available in multiples of 4 ft. lengths, with a coupling to join sections of tubing. **See Table 4** for more information.

WARRANTY

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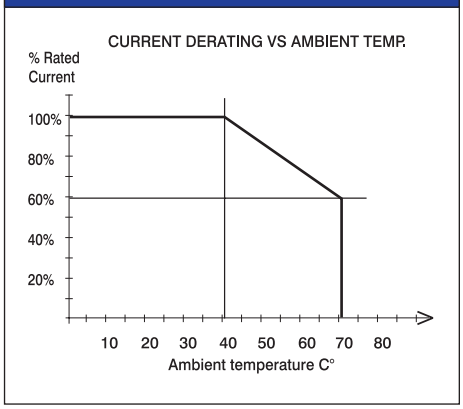
FIGURE 1 - DERATING



SPECIFICATIONS

- **Power Source: 95 - 250 VAC**
- **Frequency: 47 - 64Hz**
- **Current Ratings:**
  0.5 - 7.0 at 120VAC
  0.5 - 4.0 at 240VAC
- **Storage Temperature:**
  40°C to 125°C
- **Operating Temperature:**
  25°C to 70°C

TABLE 4 - SERVICE PARTS

Zone Pressure Regulator (ZPR-2)	28 665
PVC Tubing 1/8" ID X 1/4" OD (Order multiples of 4 ft.)	84 307
Tube coupler Nylon 1/8" x 1/8" ID	84 310

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