



AirCare Automation, Inc.

AirCare *Variphase*™:

Application Note -1001: Using Differential Pressure Switch Feedback

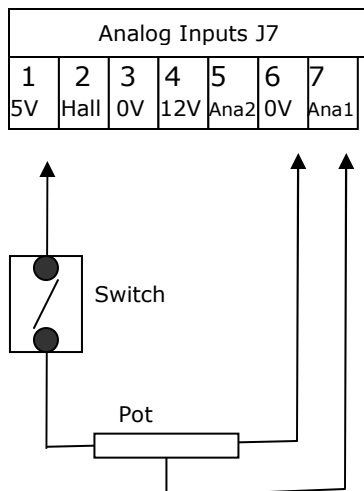
Using A Differential Pressure Switch for Feedback

A differential pressure switch can be used to provide protection or feedback for an abrupt change in state of your controlled environment. Some examples of differential pressure switch use with the AirCare *Variphase*™ products are depicted in the following diagrams. The operational modes described require setting the appropriate configuration jumpers (JP1-6).

Option Jumpers

JP1	JP2	JP3	JP4	JP5	JP6
Analog	20mA	Baud	4-20mA	Closed Loop	4-Wire

- Analog Install jumper to select analog input speed control from either 0-5V or 4-20mA sources. When jumper position is open, the control responds to Modbus speed commands.
- 20mA Install Jumper to enable current loop shunt on Analog Input 1. JP1 should also be closed to enable 4-20mA control. Leave switch open for 0-5V control.
- Baud Install jumper to select 9600 baud. Default is 1200.
- 4-20mA Install jumper to enable 4-20mA loop on Analog Input 1. If jumper position is open, the 4mA offset will not be factored, resulting in a 0-20mA control range.
- Closed Loop Install jumper to enable closed loop control using an external speed sensor. The sensor will be used to regulate the set speed in RPM. If jumper position is open, the sensor input will not be used for motor speed control but in network control mode, RPM will still be reported if a sensor is connected.
- 4-Wire Fit Jumper to select 4-wire (RS422) communications. Default (jumper open) is 2-wire (RS485) communications.



Open Loop Analog Control, Close to Run

In this configuration, a three terminal potentiometer is used to adjust the motor speed. The differential pressure switch is used to turn the motor ON or OFF.

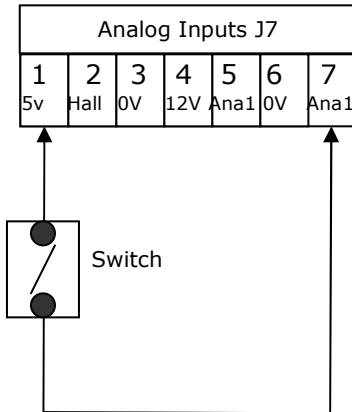
As drawn, if the switch is OPEN then the motor will be turned OFF. If the switch is CLOSED then the motor speed will rise to the set levels. For this application option jumper JP1 must be closed.



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AirCare *VariPhase*™:

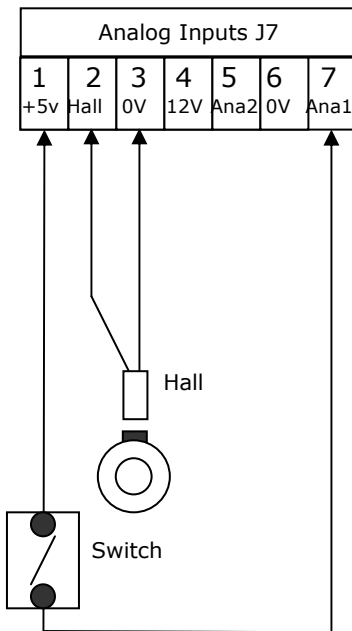
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Open Loop Network Control

In this configuration, the network control (AirCare *Console*™) is used to set the motor speed.

The differential switch can be either a normally open (N/O) or normally closed (N/C) device. The AirCare *Console*™ will monitor the status of the switch and will read "err" if the switch is tripped. The AirCare *Console*™ error set point for Ana1 is 2.5V. (See AirCare *Console*™ Manual for more information). The AirCare system can also be configured to set-off an alarm using an optional ACM1009 Network Relay Driver. For this application option jumper JP3 must be closed.



Closed Loop Network Control

In this configuration the motor speed is controlled through the network port by the AirCare *Console*™. As in the previous example, the console will provide an error message if the pressure sensor switch is tripped.

In this application a hall effect sensor provides feedback signal used by the AirCare *VariPhase*™ to regulate speed (RPM). In this application option jumpers JP3 and JP5 must be closed.

For more information on closed-loop control with the AirCare *VariPhase*™ please see the *VariPhase*™ User's Manual.