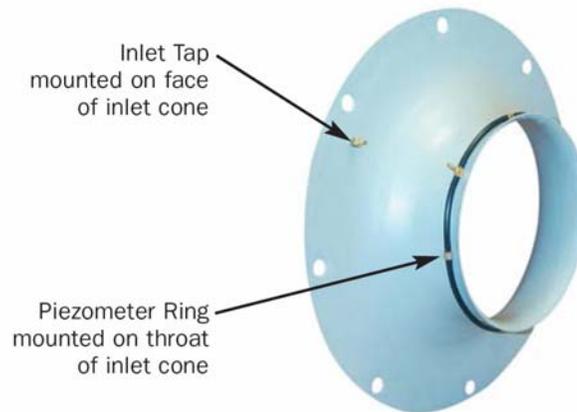


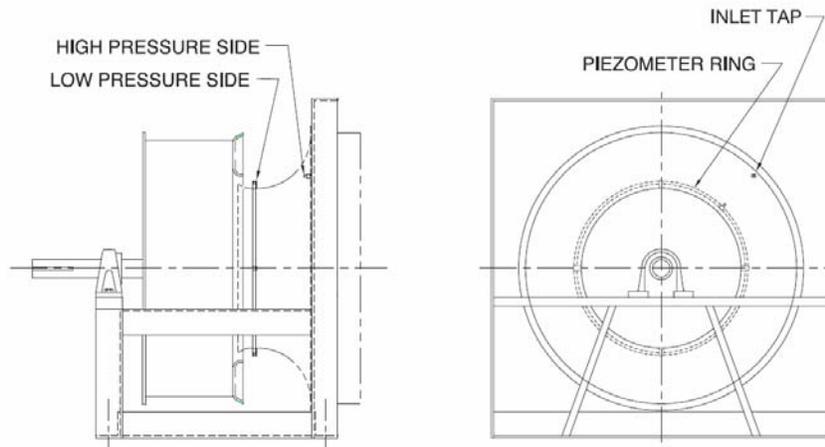
PIEZOMETER AIRFLOW MEASURING RING

M.K. Plastics is pleased to introduce The Piezometer Airflow Measuring Ring, now available as an accessory for our steel Axijet fans. The system consists of a Piezometer ring mounted at the throat and a static pressure tap mounted on the face of the inlet cone. A differential pressure transducer and digital display can also be provided. Based on laboratory tests, the system was determined to be accurate within +/-5%.

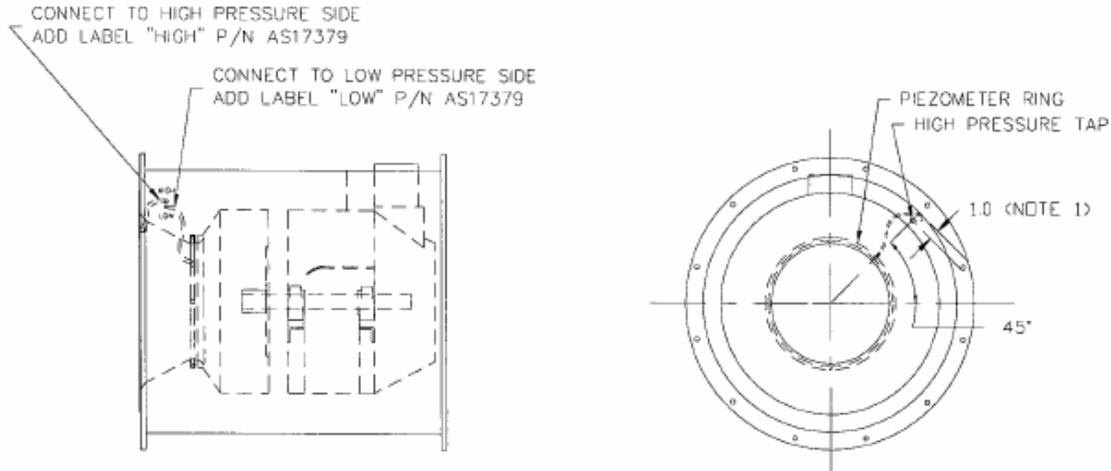


HOW IT WORKS

The System is based on the principle of a flow nozzle. The inlet cone of the fan is used as the flow nozzle, and the flow can be calculated by measuring the static pressure drop through the inlet cone. The pressure drop is measured from the tap located on the face of the inlet cone to the piezometer ring in the throat. The inlet tap is connected to the high-pressure side of the transducer and the piezometer ring is connected to the low-pressure side (see diagram below).



TAP LOCATIONS FOR IN-LINE VERTICAL AXIJET FANS



Measurement of Airflow

The equations below are accurate for flow estimation for flows from 40% to 100% of wide-open volume. According to testing done previously at M.K. Plastics, several factors affect the accuracy of this method of determining flow. The equations below assume the following:

- There are no vanes or other obstructions in or near the inlet
- Even flow entering the funnel (no pre-swirl)
- Standard wheel to inlet cone overlap
- Accurate determination of air density at the inlet
- Free inlet (consult M.K. Plastics for ducted inlet factors)

Non-Standard Density Method

One of the following equations is used to measure the flow:

$$ACFM = C1 * A * \sqrt{(\Delta P / \rho)}$$

A = Actual inlet funnel throat area (Sq. ft) - available from M.K. Plastics

ΔP = The differential in static pressure from the piezometer ring and the front pressure tap (inch-w.g.)

P = Air density (pounds mass/cubic ft)

C1 = Factor (standard centrifugal Axijets: 735.8, mixed flow Vertical Axijets: 735.83, centrifugal Vertical Axijets: 753.56).

Standard Density Method

The equations can be simplified by assuming standard density and assuming funnel dimensions match drawing dimensions. For the 'F' factor, consult M.K. Plastics. The equation then becomes the following -

For standard air ($\rho = 0.075 \text{ lb/ft}^3$):

$$\text{ACFM} = F \sqrt{\Delta P}$$

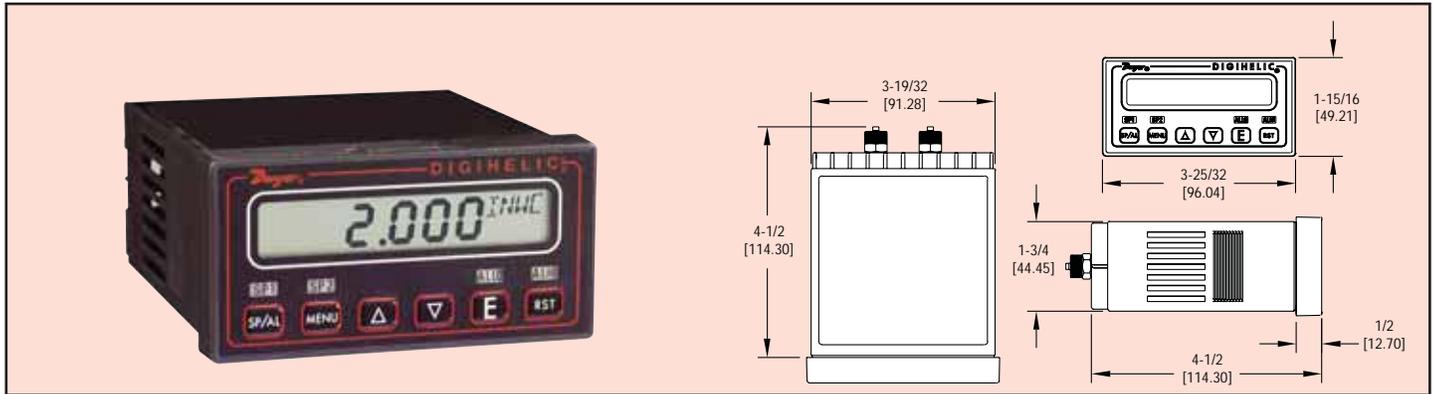
F = Factor (consult M.K. Plastics)

ΔP = The differential in static pressure from the piezometer ring and the front pressure tap (inch-w.g.)

Series
DH

Digihelic® Differential Pressure Controller

3-in-1 Instrument: Gage, Switch and Transmitter



The Series DH Digihelic® Differential Pressure Controller is a 3-in-1 instrument possessing a digital display gage, control relay switches, and a transmitter with current output. Combining these three features allows the reduction of several instruments with one product, saving inventory, installation time and money. The Digihelic® controller is the ideal instrument for pressure, velocity and flow applications, achieving a 0.5% full scale accuracy on ranges from 5 to 100 in. w.c. The Digihelic® controller allows the selection of pressure, velocity or volumetric flow operation in several commonly used engineering units. Two SPDT control relays with adjustable dead bands are provided along with a scalable 4-20mA process output. The Series DH provides extreme flexibility in power usage by allowing 120/220 VAC and also 24 VDC power which is often used in control panels.

Programming is easy using the menu key to access five simplified menus which provide access to: security level; selection of pressure, velocity or flow operation; selection of engineering units; K-factor for use with flow sensors; rectangular or circular duct for inputting area in flow applications; set point control or set point and alarm operation; alarm operation as a high, low or high/low alarm; automatic or manual alarm reset; alarm delay; view peak and valley process readings; digital dampening for smoothing erratic process applications; scaling the 4-20mA process output to fit your application's range; Modbus® communications; and field calibration.

With all this packed into one product it is easy to see why the Digihelic® controller is the only instrument you will need for all your pressure applications.

APPLICATIONS

- Dust Collection Bag Filters
- SCFM Flow In Ducts
- Air Flow for Industrial Ovens
- Filter Status
- Clean Room Pressure
- Fume Hood Air Flow
- Pharmaceutical or Bio-Medical Glove Box Pressures
- Static Pressures in Ducts or Buildings
- Damper Control
- Fan Control

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.

Wetted Materials: Consult factory.

Housing Material: ABS plastic, UL approved 94-V-0.

Accuracy: ±0.5% at 77°F (25°C) including hysteresis and repeatability.

Stability: < ±1% per year.

Pressure Limits: Ranges ≤ 2.5 in. w.c. = 2 psi

5": 5 psi; 10": 5 psi; 25": 5 psi; 50": 5 psi; 100": 9 psi.

Temperature Limits: 32 to 140°F (0 to 60°C).

Compensated Temperature Limits: 32 to 140°F (0 to 60°C).

Thermal Effects: 0.020%/°F (0.036/°C) from 77°F (25°C).

Power Requirements: High Voltage Power = 100 to 240 VAC, 50 to 400 Hz or 132 to 240 VDC.

Low Voltage Power = 24 VDC ±20%.

Power Consumption:

Low Voltage Power = 24 VDC - 130 mA max.

High Voltage Power = 100 to 240 VAC, 132 to 240 VDC - 7VA max.

Output Signal: 4-20 mA DC into 900 ohms max.

Zero & Span Adjustments: Accessible via menus.

Response Time: 250 ms.

Display: 4 digit LCD 0.4" height.

LED indicators for set point and alarm status.

Electrical Connections: Screw terminals.

Process Connections: Compression fitting for use with 1/8" ID X 1/4" OD tubing (3.175 mm ID x 6.35 mm OD).

Enclosure Rating: Face designed to meet NEMA 4X (IP66).

Mounting Orientation: Mount unit in horizontal plane.

Size: 1/8 DIN.

Panel Cutout: 1.772 x 3.620 in (45 x 92 mm).

Weight: 14.4 oz. (408 g).

Serial Communications: Modbus® RTU, RS485, 9600 Baud.

Agency Approvals: CE, UL.

SWITCH SPECIFICATIONS

Switch Type: 2 SPDT relays.

Electrical Rating: 8 Amps at 240 VAC resistive.

Set Point Adjustment: Adjustable via keypad on face.

Modbus® is a registered trademark of Schnieder Automation.

One Control for all your Pressure Applications

Reduces Instruments, Inventory, Installation Time and Cost

Compact 1/8 DIN housing reduces panel space.

Set Point Status LED Indicators display set point activation. Allows user to view process status from a distance.

"Hot Key" saves time by allowing instant access to set point and alarms. Set points/alarms can be easily adjusted with arrow keys.

Menu Key Scrolls through menus to adjust settings. 5 simple menus allow for quick set-up and reduced installation time.

Adjustable clip for panel mounting

Set point 2 or alarm output (SPDT). Selectable direct acting control relay with adjustable deadband or high, low or high low alarm.

4-20 mA process output. View process remotely or send signal to PLC. Alleviates purchase of a separate transmitter.

24 VDC power supply. Universal power supply eliminates options, inventory and ordering mistakes.



Selectable Engineering Units in Pressure, Velocity or Flow, programmed on one unit. Alleviates time consuming conversions and flow charts

Alarm LED Indicator shows alarm activation status. View alarm status from a distance.

Reset button for clearing an alarm when alarm is set for manual operation.

Enter a menu or store a value. From home display press to view full scale range.

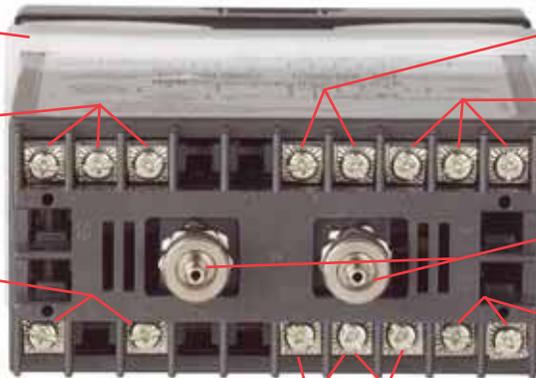
120-240 VAC power supply. Reduce inventory and eliminate lead times with universal power supply.

Set point 1 output (SPDT). Direct or reverse acting control relay with adjustable deadband.

Durable compression fittings for 1/4" O.D. x 1/8" I.D. plastic tubing. Secures tubing in harsh applications where vibration & temperature fluctuations occur.

RS-485 serial communications. View, record, and adjust control settings remotely from a computer with Modbus® protocol.

Remote reset switch for alarm. Acknowledge alarm from remote location. For users that need quick alarm reset from a distance.



MODELS

Available Pressure Engineering Units												
Model No.	in. wc	ft. wc	mm wc	cm wc	psi	in. Hg	mm Hg	mbar	Pa	kPa	hPa	oz./in. ²
DH-002	.2500		6.350	0.635			0.467	0.623	62.28		0.623	0.144
DH-004	1.000		25.40	2.540			1.868	2.491	249.1	0.249	2.491	0.578
DH-006	5.000	.4167	127.0	12.70	.1806	.3678	9.342	12.45	1245	1.245	12.45	2.890
DH-007	10.00	.8333	254.0	25.40	.3613	.7356	18.68	24.91	2491	2.491	24.91	5.780
DH-008	25.00	2.083	635.0	63.50	.9032	1.839	46.71	62.27	6227	6.227	62.27	14.45
DH-009*	50.00	4.167	1270	127.0	1.806	3.678	93.42	124.5		12.45	124.5	28.90
DH-010*	100.0	8.333	2540	254.0	3.613	7.356	186.8	249.1		24.91	249.1	57.80

Bi-Directional* Ranges also available: DH-012 Range: 0.25 - 0 - 0.25" w.c.

DH-014 Range: 1.0 - 0 - 1.0" w.c.

DH-015 Range: 2.5 - 0 - 2.5" w.c.

DH-016 Range: 5 - 0 - 5" w.c.

DH-017 Range: 10 - 0 - 10" w.c.

*Velocity and volumetric flow not available on bi-directional range units and models DH-009 & DH-010.

ACCESSORIES

The Mother Node™ converter is an easy solution for utilizing the Digihelic® Controller's RS-485 serial communication and connecting to virtually any PC.

351-9N, Mother Node™ silver RS-232 to RS-485 Converter with DB9F Connector.

351-9, Mother Node™ silver RS-232 to RS-485 Converter with DB9F Connector. Includes 120 VAC to 12 VDC adapter.

A-266, Digihelic® surface mounting bracket.

A-203, 1/8" I.D. x 1/4" O.D. PVC tubing.

Digihelic® Links, Communication Software

Modbus® is a registered trademark of Schneider Automation.

