



## PRECAUTIONS

- **R**EMOVE POWER BEFORE WIRING. NEVER CONNECT OR DISCONNECT WIRING WITH THE POWER APPLIED. DO NOT ALLOW LIVE WIRES TO TOUCH THE CIRCUIT BOARD.
- AN ISOLATION TRANSFORMER IS RECOMMENDED WHEN POWERING THE DEVICE WITH 24VAC.
- DO NOT RUN THE WIRING IN ANY CONDUIT WITH LINE VOLTAGE.
- FAILURE TO WIRE DEVICES WITH THE CORRECT POLARITY WHEN USING A SHARED TRANSFORMER MAY RESULT IN DAMAGE TO ANY DEVICE POWERED BY THE SHARED TRANSFORMER.

#### MEDIA

The DPA3 can be used to monitor the differential pressure in any application that uses dry air or inert gas.

#### DIN RAIL MOUNTING (Optional Accessory Ordered)

Attach the DIN Rail Mounting accessory to the back of the enclosure using the two screws provided. To mount the sensor on the DIN Rail, place the bottom of the DIN Rail Clip into the 35mm DIN Rail and push the unit upward to engage the spring clip. Now press the top of the unit back until it locks into place (see Figure 2).



Figure 2: DIN Rail Mounting

## PITOT TUBE INSTALLATION (Optional Accessory Ordered)

Slip the rubber washer over the threaded end of the pitot tube, keeping the washer as close to the threaded end as possible. Fasten the pitot into the threaded insert on the back of the enclosure. Press the rubber washer against the enclosure.





## TUBING SETUP WHEN PITOT TUBE IS INSTALLED

Units will be shipped with silicone tubing attached to the high and low pressure barb fittings. The silicone tubing will need to be removed from the High Pressure (H) barb fitting and secured onto the pitot tube barb fitting. This will leave the high pressure barb fitting open to atmosphere, and the Low pressure barb fitting remaining at default setup.



**Figure 4: Pitot Tube Installation** 

## MOUNTING

**Two size #8 x 3/4" self drilling screws are supplied.** Mount the unit vertically with the brass fittings pointing towards the ground. Attach the unit to the mounting surface using the two mounting holes located on the top and bottom flanges. For best results, all tubing lengths should be limited to a maximum length of 75 feet (23 meters).

## PRESSURE CONNECTIONS

The recommended connection tubing is <sup>1</sup>/<sub>4</sub>" O.D push-on tubing (1/8" to 3/16" I.D.).

Kele Inc. 3300 Brother Blvd. Memphis, TN 38133 PH: (901) 937-4900



## Figure 5: DPA3 Mounting

## WIRING

Shielded is recommended cable with 16 to 24AWG conductors. The hinged cover must be opened to connect wires to the unit's finger push-button terminal blocks. Each DPA3 unit can be configured to three output signals: 4-20mA, 0-5V or 0-10V. Use the Wiring Connections (**Table 1**) and diagrams (**Figure 7**) to determine the proper wiring for your application. See **Table 1** for Output Mode and Output Signal switch positions.

Output Signal	Output Mode	Output Signal	Supply Voltage	Wire Connections			
	(SW1)	(SW3 Position 4)		Red	Black	White	Yellow
0-5 VDC	Vout	5V	VAC/VDC	V+	COM	VOUT	n/c
0-10 VDC	Vout	10V	VAC/VDC	V+	COM	VOUT	n/c
4-20 mA	mA	n/a	VDC	V+	n/c	n/c	IOUT

n/a=Not Applicable n/c=No Connection **Table 1: Wiring Connections** 



Figure 6: SW1 and SW3 Output Switches



### **Figure 7: Wiring Connections**

- When using  $\frac{1}{2}$ " conduit, the strain relief fitting must be removed from the enclosure.
- Make sure that any conduit or metal fittings do not come in contact with the circuit board.

#### ZERO FUNCTION

The DPA3 unit should be "ZEROED" before pressure is applied to the unit.

The zero button is used to cancel out any offsets caused by installation and sensor drift.

#### The Zero adjustment must be performed with NO pressure applied to either side of the sensor.

- Remove the tubing connected to the H(High) and/or L(Low) pressure fittings.
- Push "ZERO" button for more than three seconds before installation or whenever necessary.

For units with LCD display: "AUTOZERO" icon will be on when the unit enters zero mode. If zeroing process is successful, the "AUTOZERO" icon will flash twice.

#### PRESSURE RANGE SELECTION

#### If a custom calibrated range is ordered, DO NOT change Range Selection DIP switch settings.

The DPA3 can operate in either unidirectional mode (0 - X inWC) or bidirectional mode  $(\pm X \text{ inWC})$ . Each unit could have up to eight field selectable, uni or bidirectional ranges.

- DO NOT SWITCH PRESSURE RANGE OR OUTPUT MODE WHEN POWER IS ON. MAKE SURE POWER TO THE UNIT IS OFF. FAILURE TO DO SO WILL NOT ALLOW ANY NEW SWITCH SETTINGS TO TAKE PLACE.
- CHOOSE DIFFERENTIAL RANGE BASED ON THE EXPECTED DIFFERENTIAL PRESSURE IN YOUR APPLICATION, MOVE SWITCHES TO THE CORRECT POSITIONS AND THEN POWER ON THE TRANSMITTER.

#### • MAXIMUM PRESSURE

Part No.	Maximum Pressure (inWC)
DPA3-1	1
DPA3-10	10
DPA3-40	40

## Unidirectional Mode

- DIP switch SW3 position five set at UNI side.
- DIP switch SW3 positions one and two are for Range Selection

Part No.	SW3 Position 1: 1		SW3 Position 1: 2		
	Position 2: A	Position 2: B	Position 2: A	Position 2: B	
DPA3-1	1 inWC	0.5 inWC	0.2 inWC	0.1 inWC	
DPA3-10	10 inWC	5 inWC	2 inWC	1 inWC	
DPA3-40	40 inWC	30 inWC	20 inWC	10 inWC	
	1	1	1	1	

See Figure 8

## **Bidirectional Mode**

- DIP switch SW3 position five set at **BI** side.
- DIP switch SW3 positions one and two are for Pressure Range Selection.

Note: In Bidirectional mode, a value of 0 inWC will have an output equal to 50% of the output signal range (12mA, 2.5V, 5V).

Part No.	SW3 Position 1: 1		SW3 Position 1: 2		
	Position 2: A	Position 2: B	Position 2: A	Position 2: B	
DPA3-1	±1 inWC	±0.5 inWC	±0.2 inWC	±0.1 inWC	
DPA3-10	±10 inWC	±5 inWC	±2 inWC	±1 inWC	
DPA3-40	±40 inWC	±30 inWC	±20 inWC	±10 inWC	

See Figure 8



#### Figure 8: PCB Layout

#### ENGINEERING UNITS ADJUSTMENT

This option is ONLY for units with LCD display. Switch DIP switch SW3 position three to select Pa or inWC. If switched with power on, unit change will not take place until power is cycled.

## DIAGNOSTIC OUTPUT

Each DPA3 unit has the feature to check the pressure on the sensor. When the sensor's input pressure is out of range, the DPA3 will output 5.25V for a 0-5V output; 10.5V for a 0-10V output and 22mA for a 4-20mA output.

If a DPA3 unit is outputting an out-of-range diagnostic signal, please turn off the unit immediately, and check the pressure input with a gauge or other test instrument.

Once the pressure has been verified, set the Range Selection DIP switch to the proper positions based upon your maximum expected differential pressure.

# For units with LCD display:

"OUT OF RANGE" icon will be on when differential pressure is over or under the minimum or maximum pressure range selected.

## PRODUCT SPECIFICATIONS

Supply Voltage	4-20 mA Output: 16-36 VDC (250 Ohm Load max.) / 22-36 VDC (500 Ohm Load max.)		
	0-5 VDC / 0-10 VDC Output: 16-36 VDC / 24 VAC (+/- 10%)		
Supply Current	4-20 mA Output: 24 mA minimum   0-5 VDC / 0-10 VDC Output: 6 mA maximum		
Output Signals	Current Output: 4-20 mA, 2-Wire Loop Powered (Standard); (Current limited to 21.4 mA max)		
	Voltage Signals: 0-5 VDC / 0-10 VDC Field Selectable, 3-Wire; Output limited @ 5.25 & 10.5 VDC)		
Response Time (0-100% FSO)	8 seconds		
Output Update Rate	1 second		
Pressure Ranges	See Product Ordering Grid (Data Sheet); Field Selectable Uni and Bi-Directional Ranges		
Accuracy <sup>1</sup>	+/- 0.5% FSO; +/- 0.25% (Only for Specified Range)		
Zero Function	Pushbutton Zero Function		
Thermal Effects <sup>2</sup>	+/- 0.067% FSO / °F (0.12% FSO / °C)		
Proof Pressure / Burst	DPA3-1: Proof: 270 inWC (67.2 kPa)   Burst: 415 inWC (103.3 kPa) for 1 inWC (249.8 Pa)		
Pressure <sup>3</sup>	DPA3-10: Proof: 350 inWC (87.12 kPa)   Burst: 550 inWC (136.9 kPa) for 10 inWC (2490.8 Pa)		
	DPA3-40: Proof: 562 inWC (140 kPa)   Burst: 1004.7 inWC (250 kPa) for 40 inWC (9963.6 Pa)		
Operating Temperature Range	-4 to 185°F (-20 to 85°C)		
Compensated Temperature Range	32 to 122°F (0 to 50°C)		
Storage Temperature Range	-22 to 185°F (-30 to 85°C)		
<b>Operating Humidity Range</b>	10 to 95% RH, non-condensing		
Media Types	Dry air or inert non-conductive gases		
Enclosure Material / Flammability Rating	Flame Retardant Polycarbonate; UL94-5VA		
Wiring Connections	Finger Pushbutton (Spring) Terminal Blocks; accepts 16-24 AWG wires		
Conduit Knockouts	Watertight Cordgrip Installed (1/2" NPT Conduit fittings accepted when Cordgrip removed)		
Pressure Fitting Material	Nickel Plated Brass or Stainless Steel		
Tubing Size Accepted	1/4" O.D. x 0.170" I.D. Poly Tubing		
Approvals	CE, Reach, RoHS2, WEEE		
Product Weight (No Pitot	Non-LCD Display Version: 0.53 lbs (0.240 kg)   LCD Display Version: 0.58 lbs (0.263 kg)		
Product Weight (With Pitot	Non-LCD Display Version: 0.80 lbs (0.363 kg)   LCD Display Version: 0.85 lbs (0.385 kg)		
Tube & Din Rail)			
NIST Certification	3 Point: Test Points 10%, 50%, and 90% FSO		
	5 Point: Test Points 10%, 30%, 50%, 70% and 90% FSO		

Note<sup>1</sup>: Accuracy includes linearity, hysteresis & repeatability.

Note<sup>2</sup>: Shift is relative to 77°F (25°C).

Note3: "x" designates both the LCD "-D-" & Non-LCD Display "-N-" versions.

#### **Table 2: Product Specifications**

## WARRANTY SPECIFICATION

The DPA3 Series pressure transmitters are covered by Kele's Five (5) Year Limited Warranty.