

## Deltapi N Series Pneumatic Transmitters Model NAB Differential pressure transmitter

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### GENERAL CHARACTERISTICS

The blind type differential pressure transmitter, mod. NAB, is used to measure and convert a differential pressure value into a proportional pneumatic signal.

The instrument works on the force-balance principle and consists of two main units:

**the measuring unit** which detects the differential pressure variation and consists of two forged bodies and a measuring capsule.

The capsule is available in a single version of 5 in diameter diaphragms, filled with a special liquid which can withstand the maximum rated static pressure on either side without damaging itself.

**the transmission unit** converts the differential force applied to the measuring element into a proportional output pneumatic signal.

The output pressure, generated by a flapper nozzle relay, feeds the feedback bellows with a rising pressure until the bellows force balances that of the measuring element.

**Span value** continuously adjustable by an internal micrometric screw.

**Zero value** adjustable by an external screw.

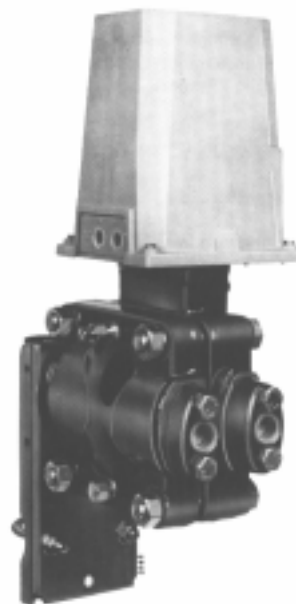
**Mounting** in a vertical position on 2in diameter pipe by a special bracket.

### OPTIONAL EXTRA FEATURES

**Special feedback bellows** allow to reduce the standard calibration span to a lower value (see table)

**A zero elevation or suppression device** allows to set as a zero of the transmitter a measured variable value different from zero.

The sum of the zero suppression value (S) plus the calibrated span cannot exceed the upper range limit (M) suitable for the diaphragm capsule :  $S + \text{span} \leq M$  (see table).



**Air filter regulator** can be directly mounted on the transmitter, with or without pressure gauge, and connected with piping and fittings either in stainless steel or copper.

Special versions of air filter regulator and gauges, in stainless steel, are available on request.

**Manifold.** The transmitter can be supplied with a 3-valve manifold block integrally mounted to simplify maintenance and calibration procedures.

**Oxygen measurements**, special degreasing and final test operations can be required on the oxygen measuring transmitter

## SPECIFICATIONS

The data were obtained from laboratory tests on standard instruments with:  
carbon steel or AISI 316L bodies; AISI 316L measuring element with silicone oil filling; gasket: PTFE;  
calibration span : 4 kPa - 40 mbar.

| MEASURING CAPSULE<br>(DIAPHRAGM DIA.) | SPAN LIMITS<br>min. and max.      | RANGE LIMITS<br>lower and upper (M)   | MAXIMUM ZERO SUPPRESSION (S) | MAXIMUM ZERO ELEVATION | STATIC PRESSURE LIMITS<br>Full vacuum and |
|---------------------------------------|-----------------------------------|---------------------------------------|------------------------------|------------------------|---|
| 5 in                                  | 1.2 and 7.5 kPa<br>12 and 75 mbar | -7.5 and +7.5 kPa<br>-75 and +75 mbar | 6.3 kPa<br>63 mbar           | 7.5 kPa<br>75 mbar     | 7,5 MPa (•)<br>75 bar (•)                 |
| with special feedback bellows         | 0.6 and 1.2 kPa<br>6 and 12 mbar  | -7.5 and +7.5 kPa<br>-75 and +75 mbar | 6.9 kPa<br>69 mbar           | 7.5 kPa<br>75 mbar     |   |

(•) Equal to Maximum Working pressure as well as overrange limit (on either side).

### Air supply

nom. 140 kPa (1.4 bar, 20 psi); min. 125 kPa (1.25 bar, 18 psi); max. 175 kPa (1.75 bar, 25 psi)

### Output signal

20 to 100 kPa/0.2 to 1 bar, 3 to 15 psi or 0.2 to 1 kg/cm<sup>2</sup>

### Static air consumption

350 NI/h

### Maximum output flow

- with rising output pressure: 30 NI/min.
- with falling output pressure: 40 NI/min.

### Accuracy

± 0.5% F.S.D. (typical)

### Thermal drift (for ambient temperature variation between -20° C and + 65° C)

- span 1.2 to 2 kPa (12 to 20 mbar): 0.6%/10°C
- span 2 to 7.5 kPa (20 to 75 mbar): 0.4%/10°C

### Static pressure effect

for variation of 2.5 MPa (25 bar): ≤ ± 0.25%

### Maximum displacement

2.5 cm<sup>3</sup>

### Degree of protection in accordance with IEC 529 IP55

### Ambient temperature limits

-40 and + 120°C

### Bodies material

Carbon steel, AISI 316L

### Body bolts and nuts material

High tensile carbon steel;  
AISI 316 Class A4-80 per ISO3506;  
AISI 316 Class A4-50 (\*) per ISO3506, in compliance with NACE MR0175;  
high tensile stainless steel, in compliance with NACE MR0175.

(\*) Maximum static pressure reduced to 4 MPa (40 bar)

### Cover material

thermoplastic resin

### Diaphragm material

AISI 316L, Monel (\*)

(\*) Maximum overrange pressure reduced to 5 MPa (50 bar)

### Gaskets material

PTFE, Viton

### Capsule filling

Silicone oil, Perfluorinated polyethers (Galden) (\*)

(\*) When used for oxygen measurements the operating temperature limits are -20°C and + 40°C.

### Surface protections

- carbon steel body and flange: zinc plating and chrome passivation,
- AISI 316L body and flange: no protection

### Process connections (see figure ref. D and E)

- on flanges : 1/2 in NPT-F
- on adapters: 1/4 in NPT-F
- center distance: 54 mm.

### Pneumatic connections

- Air supply (in figure ref. A): 1/4 in NPT-F
- Output (in figure ref. B): 1/4 in NPT-F

### Pressure gauge

Brass with stainless steel case (all stainless steel on request)  
external diameter 51 mm; 0-200 kPa, 0-2 bar and 0-30 psi  
indication on 82 mm/260° scale.

### Air filter regulator

with copper or stainless steel piping, as specified.  
Die cast aluminium alloy with light grey epoxy finish.

### Net weight (maximum)

16 kg approx

### Packing

expanded polythene box

# ORDERING INFORMATION

Select one character or set of characters from each category and specify complete catalog number.

## PRODUCT CODE

|                   | abc | de | fg | hi | j | k | lm |
|-------------------|-----|----|----|----|---|---|----|
| BASE MODEL        |     |    |    |    |   |   |    |
| VERSION           |     |    |    |    |   |   |    |
| BODY              |     |    |    |    |   |   |    |
| MEASURING ELEMENT |     |    |    |    |   |   |    |
| GASKETS           |     |    |    |    |   |   |    |
| OUTPUT            |     |    |    |    |   |   |    |
| EXTRAS            |     |    |    |    |   |   |    |

|            |                                   |             |
|------------|-----------------------------------|-------------|
| <b>abc</b> | <b>BASE MODEL</b>                 | <b>Code</b> |
|            | Differential pressure transmitter | <b>NAB</b>  |

|           |   |           |
|-----------|---|-----------|
| <b>de</b> | <b>VERSION</b>  |           |
|           | Standard with body bolts and nuts in high tensile carbon steel    | <b>01</b> |
|           | As 01 with integrally mounted manifold (to be quoted separately)  | <b>07</b> |
|           | Standard with body bolts and nuts in AISI 316                     | <b>11</b> |
|           | As 11 with integrally mounted manifold (to be quoted separately)  | <b>17</b> |
|           | Standard with body bolts and nuts in high tensile stainless steel | <b>21</b> |
|           | As 21 with integrally mounted manifold (to be quoted separately)  | <b>27</b> |
|           | Standard with body bolts and nuts in AISI 316                     | <b>51</b> |
|           | As 51 with integrally mounted manifold (to be quoted separately)  | <b>57</b> |
|           | Maximum operating pressure reduced to 4 MPa (57.0 psi)            |           |

|           |              |           |
|-----------|--------------|-----------|
| <b>fg</b> | <b>BODY</b>  |           |
|           | Carbon steel | <b>01</b> |
|           | AISI 316L    | <b>11</b> |

| <b>MEASURING ELEMENT</b> |                           |                      |                        |                         |  |           |
|--------------------------|---------------------------|----------------------|------------------------|-------------------------|--|-----------|
| <b>hi</b>                | <b>Diaphragm material</b> | <b>Core material</b> | <b>Capsule filling</b> | <b>Capsule diameter</b> | <b>Span limits kPa (inH<sub>2</sub>O) - (Note 1)</b> |           |
|                          | AISI 316L                 | AISI 316L (Note 2)   | Inert fill (*)         | 5 in                    | 1.2 and 7.5 (4.8 and 30)                             | <b>04</b> |
|                          | AISI 316L                 | AISI 316L (Note 2)   | Inert fill (*)         | 5 in                    | 0.6 and 1.2 (2.4 and 4.8)                            | <b>06</b> |
|                          | Monel                     | Monel (**)           | Silicone oil           | 5 in                    | 1.2 and 7.5 (4.8 and 30)                             | <b>21</b> |
|                          | Monel                     | Monel (**)           | Silicone oil           | 5 in                    | 0.6 and 1.2 (2.4 and 4.8)                            | <b>23</b> |
|                          | AISI 316L                 | AISI 316L (Note 2)   | Silicone oil           | 5 in                    | 1.2 and 7.5 (4.8 and 30)                             | <b>41</b> |
|                          | AISI 316L                 | AISI 316L (Note 2)   | Silicone oil           | 5 in                    | 0.6 and 1.2 (2.4 and 4.8)                            | <b>43</b> |

**Note 1:** Multiply by 10 the value in kPa (MPa) to obtain mbar (bar).

**Note 2:** Hastelloy C for some wetted parts.

(\*) Suitable for oxygen service (operating temperature limits reduced: -20°C to + 40°C; -4°F to 104°F)

(\*\*) Maximum overrange reduced to 5 MPa (725 psi)

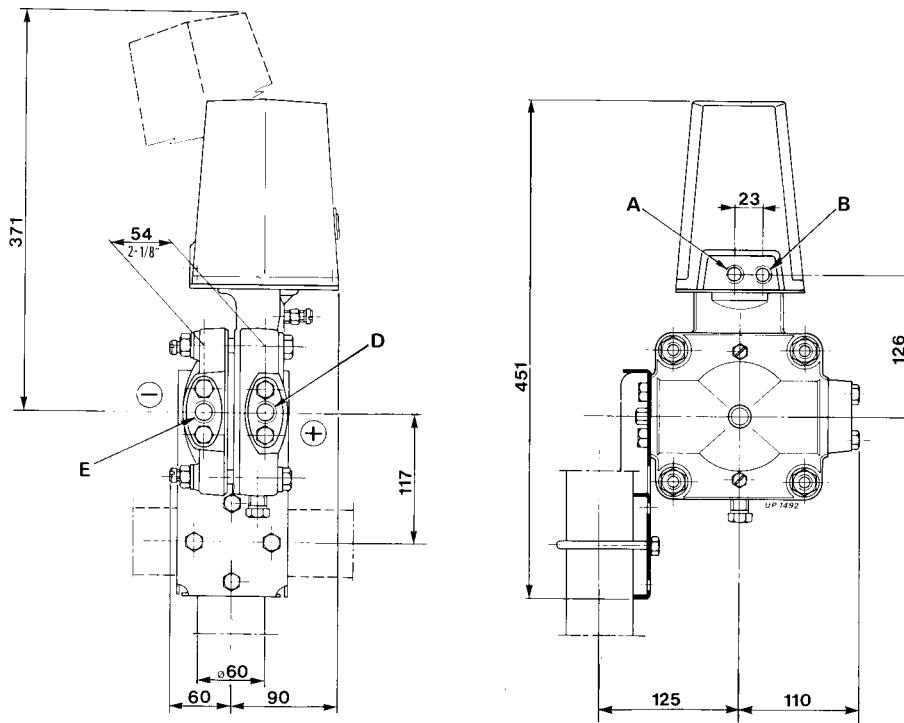
| <b>j</b> | <b>GASKETS</b>       |                       |                                 |          |
|----------|----------------------|-----------------------|---------------------------------|----------|
|          | <b>Flange gasket</b> | <b>Capsule gasket</b> | <b>Fulcrum diaphragm gasket</b> |          |
|          | Viton                | Viton                 | Viton                           | <b>4</b> |
|          | PTFE (*)             | PTFE (*)              | PTFE (*)                        | <b>5</b> |

(\*) Suitable for oxygen service

|          |  |          |
|----------|--|----------|
| <b>k</b> | <b>OUTPUT</b>  |          |
|          | 3 to 15 psi  | <b>1</b> |
|          | 3 to 15 psi with zero elevation device                     | <b>2</b> |
|          | 3 to 15 psi with zero suppression device                   | <b>3</b> |
|          | 0.2 to 1.0 kg/cm <sup>2</sup>                              | <b>4</b> |
|          | 0.2 to 1.0 kg/cm <sup>2</sup> with zero elevation device   | <b>5</b> |
|          | 0.2 to 1.0 kg/cm <sup>2</sup> with zero suppression device | <b>6</b> |
|          | 20 to 100 kPa / 0.2 to 1 bar                               | <b>7</b> |
|          | 20 to 100 kPa / 0.2 to 1 bar with zero elevation device    | <b>8</b> |
|          | 20 to 100 kPa / 0.2 to 1 bar with zero suppression device  | <b>9</b> |
|          | According to ANSI/ISA S 51.1-1979 standard terminology     |          |

| <b>EXTRAS</b> |                                    |                        |                             |                       |           |
|---------------|------------------------------------|------------------------|-----------------------------|-----------------------|-----------|
| <b>lm</b>     | <b>Identification tag material</b> | <b>Piping material</b> | <b>Air filter regulator</b> | <b>Pressure gauge</b> |           |
|               | Stainless Steel                    | --                     | --                          | --                    | <b>02</b> |
|               | Stainless Steel                    | Stainless Steel        | with                        | --                    | <b>10</b> |
|               | Stainless Steel                    | Copper                 | with                        | --                    | <b>11</b> |
|               | Stainless Steel                    | Stainless Steel        | with                        | with                  | <b>13</b> |
|               | Stainless Steel                    | Copper                 | with                        | with                  | <b>14</b> |

## MOUNTING DIMENSIONS



SS/NAB Rev 7



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