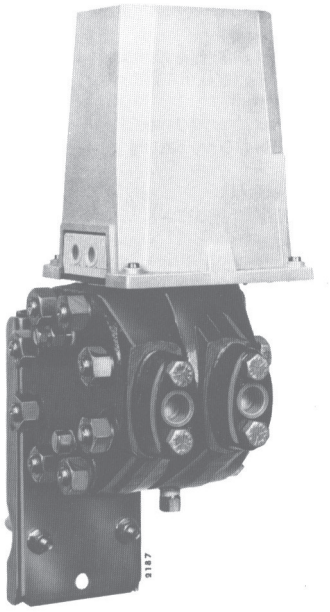
Data Sheet DS/NAD-EN Rev. G

Model NAD
Differential pressure transmitter

Deltapi N Series
A complete range of pneumatic pressure transmitters



Introduction

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

Power and productivity for a better world™

DESCRIPTION

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 two versions: 2in or 3in diameter diaphragms, filled with a special liquid, which can withstand the maximum overrange pressure on one 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

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.

SPECIFICATIONS

The data were obtained from laboratory tests on standard instruments with:
AISI 316L bodies; AISI 316L measuring element with silicone oil filling; gasket: PTFE;
calibration span : 18 kPa - 180 mbar (for 3in diaphragm), 70 kPa - 700 mbar (for 2in diaphragm)

MEASURING CAPSULE (DIAPHRAGM DIA.)	SPAN LIMITS min. and max.	RANGE LIMITS lower and upper(M)	MAXIMUM ZERO SUPPRESSION (S)	MAXIMUM ZERO ELEVATION	STATIC PRESSURE LIMITS Full vacuum and
2 in	30 and 170 kPa 300 and 1700 mbar	-170 and +170 kPa -1700 and +1700 mbar	140 kPa 1400 mbar	170 kPa 1700 mbar	41 MPa (•) 410 bar (•)
3 in	7 and 52 kPa 70 and 520 mbar	-52 and +52 kPa -520 and +520 mbar	45 kPa 450 mbar	52 kPa 520 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^2

Static air consumption
350 Nl/h

Maximum output flow
- with rising output pressure: 30 Nl/min.
- with falling output pressure: 40 Nl/min.

Accuracy
± 0.5% F.S.D. (typical)

Thermal drift (for ambient temperature variation between -20° C and + 65° C)
- **with 2 in diaphragm**
  - span 30 to 80 kPa (300 to 800 mbar): 0.4%/10°C
  - span 80 to 170 kPa (800 to 1700 mbar): 0.2%/10°C
- **with 3 in diaphragm**
  - span 7 to 10 kPa (70 to 100 mbar): 0.6%/10°C
  - span 10 to 52 kPa (100 to 520 mbar): 0.2%/10°C

Static pressure effect
for variation of 40 MPa (400 bar): ≤ ± 1%

Maximum displacement
- with 2 in diaphragm: 1 cm^3
- with 3 in diaphragm: 1.5 cm^3

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;
17-4-PH in compliance with NACE MR0175

Cover material
thermoplastic resin

Diaphragm material
AISI 316L

Gaskets material
PTFE, Viton

Capsule filling
Silicone oil, Perfluorinated polyethers (Galden)

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)
18 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

Code

abc **BASE MODEL**

Differential pressure transmitter	**NAD**

de **VERSION**

Standard with body bolts and nuts in high tensile carbon steel	**01**
As 01 with integrally mounted manifold (to be quoted separately)	**07**
Standard with body bolts and nuts in 17-4-PH	**21**
As 21 with integrally mounted manifold (to be quoted separately)	**27**

fg **BODY**

Carbon steel	**01**
AISI 316L	**11**

MEASURING ELEMENT

hi

Diaphragm material	Core material	Capsule filling	Capsule diameter	Span limits kPa (inH_2O) - (Note 1)	
AISI 316L	AISI 316L (Note 2)	Silicone oil	3 in	7 and 52 (28 and 208)	**01**
AISI 316L	AISI 316L (Note 2)	Silicone oil	2 in	30 and 170 (120 and 682)	**02**
AISI 316L	AISI 316L (Note 2)	Inert fill	3 in	7 and 52 (28 and 208)	**04**
AISI 316L	AISI 316L (Note 2)	Inert fill	2 in	30 and 170 (120 and 682)	**05**

Note 1: Multiply by 10 the value in kPa (MPa) to obtain mbar (bar).
Note 2: Hastelloy C for some wetted parts.

GASKETS

j

Flange gasket	Capsule gasket	Fulcrum diaphragm gasket	
PTFE	PTFE	Viton	**2**
PTFE	PTFE	PTFE	**5**

k **OUTPUT**

3 to 15 psi	According to ANSI/ISA S 51.1-1979 standard terminology	**1**
3 to 15 psi with zero elevation device		**2**
3 to 15 psi with zero suppression device		**3**
0.2 to 1.0 kg/cm^2		**4**
0.2 to 1.0 kg/cm^2 with zero elevation device		**5**
0.2 to 1.0 kg/cm^2 with zero suppression device		**6**
20 to 100 kPa / 0.2 to 1 bar		**7**
20 to 100 kPa / 0.2 to 1 bar with zero elevation device		**8**
20 to 100 kPa / 0.2 to 1 bar with zero suppression device		**9**

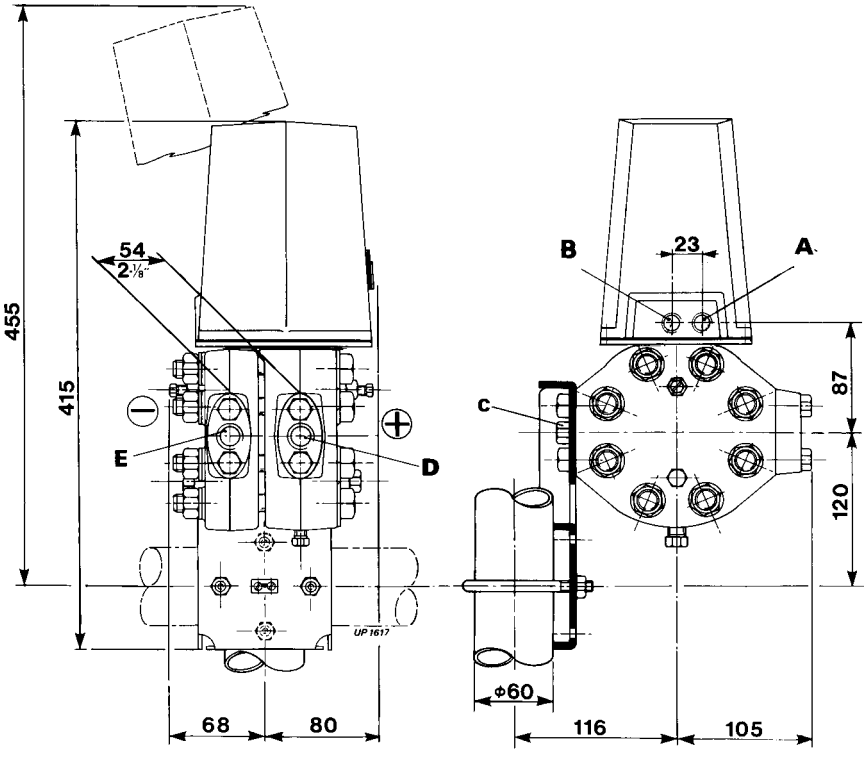
EXTRAS

lm

Identification tag material	Piping material	Air filter regulator	Pressure gauge	
Stainless Steel	- -	- -	- -	**02**
Stainless Steel	Stainless Steel	with	- -	**10**
Stainless Steel	Copper	with	- -	**11**
Stainless Steel	Stainless Steel	with	with	**13**
Stainless Steel	Copper	with	with	**14**

■ Compliance to NACE class II bolting, according to specification MR0175, latest revision

MOUNTING DIMENSIONS



Contact us

ABB Ltd.
Process Automation
Howard Road
St. Neots
Cambridgeshire PE19 8EU
UK
Tel: +44 (0)1480 475321
Fax: +44 (0)1480 217948

ABB Inc.
Process Automation
125 E. County Line Road
Warminster
PA 18974
USA
Tel: +1 215 674 6000
Fax: +1 215 674 7183

ABB Automation Products GmbH
Process Automation
Schillerstr. 72
32425 Minden
Germany
Tel: +49 551 905 534
Fax: +49 551 905 555

ABB S.p.A.
Process Automation
Via Statale 113
22016 Lenno (CO)
Italy
Tel: +39 0344 58111
Fax: +39 0344 56278

www.abb.com

3KXP900203R1001

DS/NAD-EN Rev. G 01.2011

Power and productivity
for a better world™