Specification sheet

Deltapi N Series Pneumatic Transmitters
Model NAE
Differential pressure transmitter with remote diaphragm seals

GENERAL CHARACTERISTICS

The blind type differential pressure transmitter, mod. NAE, is used to measure a differential pressure and convert it into a proportional pneumatic signal.
The instrument works on the force-balance principle and consists of two main units:

the measuring unit is formed by two AISI 316 forged halfbodies, measuring capsule and two diaphragm separators completed with capillaries.
A double diaphragm capsule is placed within two halfbodies to releve the differential pressure transmitted by the two liquid filled separators and capillaries.
The capsule is available in two versions: 2in or 3in diameter diaphragms, filled with a special liquid which can withstand the maximum rated static pressure on either side without damage.

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, is fed to a 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.
Zero suppression value (S) added to the calibrated span must never exceed the upper range limit (M) of measuring capsule: S + span ≤ 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.

SPECIFICATIONS

The data were obtained from laboratory tests on standard instruments with: AISI 316L bodies; AISI 316L measuring element ; silicone oil (DC200) 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	40 and 170 kPa 400 and 1700 mbar	-170 and +170 kPa -1700 and +1700 mbar	130 kPa 1300 mbar	170 kPa 1700 mbar	10 MPa 100 bar or flange/fitting rating of the seal whichever is less (•)
3 in	10 and 52 kPa 100 and 520 mbar	-52 and +52 kPa -520 and +520 mbar	42 kPa 420 mbar	52 kPa 520 mbar	

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

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)

Differential thermal drift (for ambient temperature variation of 20°C between the separators)
2%/10° C

Thermal drift (for ambient temperature variation between - 20° C and + 65° C)
- **with 2in diaphragm**
  span 40 to 80 kPa (400 to 800 mbar): 0.7%/10°C
  span 80 to 170 kPa (800 to 1700 mbar): 0.6%/10°C
- **with 3in diaphragm**
  span 10 to 52 kPa (100 to 520 mbar): 0.6%/10°C

- **Static pressure effect :**
  for variation of 3.5 MPa (35 bar): ≤ ± 0.25%

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

Degree of protection in accordance with IEC 529
IP55

Ambient temperature limits
-40 and + 120°C

Process temperature limits
Same as fill fluid limits. Refer to table A.
204°C (400°F) for use with Teflon anti-stick coating.

Bodies material
AISI 316L

Seal diaphragm materials
AISI 316L, Hastelloy C 276, Tantalum,
AISI 316L or Hastelloy C 276 with Teflon anti-stick coating,
AISI 316L with Teflon coating anti-corrosion and anti-stick

Measuring capsule material
AISI 316L

Capsule filling
Silicone oil

Seal filling / working temperature range
See table "A"

Cover material
thermoplastic resin

Surface protections
AISI 316L body and flange: none

Process connections
- wafer remote seals: 3in ANSI 150 to 900; DN80 DIN ND 10 to 160
- flush diaphragm flanged seal: 3in ANSI 150 to 900; DN80 DIN ND 16 to 160
- extended diaphragm flanged seal: 3in ANSI 150-300; DN80 DIN ND 16-40

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)
23 kg approx

Packing
expanded polythene box

TABLE 'A' - FILL FLUIDS CHARACTERISTICS

FILL FLUIDS (APPLICATION)	OPERATING CONDITIONS				SPECIFICATIONS @ 25°C (77°F)		
	Tmax °C (°F) @ P >of	Pmin mbar abs (psia)	Tmax °C (°F) @ P min	Tmin °C (°F)	Specific gravity	Viscosity Kinematic (cSt)	Thermal Expansions $x10^{-3}$ /°C
Silicone oil DC 200 (General purpose)	200 (390) @ 35 mbar abs	0.7 (0.1)	160 (320)	-40 (-40)	0.93	10	1.08
Silicone oil DC 702 (High temperature)	315 (600) @ atmosphere	0.7 (0.1)	200 (390)	-7 (+20)	1.07	45	0.78
Silicone oil DC 704 (High temperature)	340 (645) @ atmosphere	0.7 (0.1)	230 (445)	20 (70)	1.07	42	0.95
Neobee M-20 (Food-Sanitary)	200 (390) @ atmosphere	130 (1.9)	150 (300)	-18 (0)	0.92	9.8	1.2
Glycerin Water (70%) (Food-Sanitary)	93 (200) @ atmosphere	atmosphere	93 (200)	-7 (+20)	1.08	2.2	0.36
DC 97-9120 PHARMA B GRADE (Food-Sanitary)	200 (390) @ 35 mbar abs	0.7 (0.1)	160 (320)	-40 (-40)	0.96	50	1.04
Inert (Galden) (Oxygen Service)	160 (320) @ atmosphere	0.7 (0.1)	65 (150)	-18 (0)	1.8	4.5	1.1
KTFILL-1 (Paints and specials)	300 (570) @ 400 mbar abs	0.7 (0.1)	160 (320)	-10 (+14)	1	16	0.92

ORDERING INFORMATION

Select one character or set of characters from each category and specify complete catalog number.
In addition quote the required seal model from one of the enclosed N6 ordering information

PRODUCT CODE **abc de fg hi j k lm**

BASE MODEL
VERSION
BODY
SPAN LIMITS
CONSTRUCTION
OUTPUT
EXTRAS

abc **BASE MODEL**

	Code
Differential pressure transmitter with remote diaphragm seals	NAE

de **VERSION**

	Code
Standard	W1

fg **BODY**

	Code
AISI 316L	11

MEASURING ELEMENT

hi

Diaphragm material	Core material	Filling	Span limits kPa (inH_2O) (Note 1)	Code
AISI 316L	AISI 316L	Silicone oil	10 and 52 (40 and 208)	01
AISI 316L	AISI 316L	Silicone oil	40 and 170 (160 and 682) 10	02

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

j **CONSTRUCTION**

	Code
Transmitter with remote diaphragm seals (to be quoted separately as N6W, N6E or N6F)	2

k **OUTPUT**

		Code
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/cm²		4
0.2 to 1.0 kg/cm² with zero elevation device		5
0.2 to 1.0 kg/cm² 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	Code
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

N6W WAFER REMOTE SEALS

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

		Code
abc	**BASE MODEL**	
	Wafer remote seals	**N6W**
d	**NUMBER OF REMOTE SEALS**	
	Two remote seals	**2**
ef	**MOUNTING CONNECTION**	
	3in ANSI	**F3**
	DN80, DIN ND 10-40	**D3**
	DN80, DIN ND 64-160	**D8**
g	**OTHER WETTED MATERIAL (Not diaphragm)**	
	Same as diaphragm	**0**
h	**DIAPHRAGM MATERIAL**	
	AISI 316L serrated seat finish	**2**
	AISI 316L smooth seat finish	**L**
	Hastelloy C 276	**3**
	Tantalum (max temperature 260°C/500°F) - (NOT VACUUM)	**5**
	AISI 316L ss with Teflon anti-stick coating (only available with code F3 at position "ef")	**7**
	Hastelloy C 276 with Teflon anti-stick coating (only available with code F3 at position "ef")	**8**
	AISI 316L ss with Teflon coating anti-corrosion and antistick	**A**
i	**EXTENSION LENGTH**	
	None	**0**
j	**CAPILLARY - Fill fluid**	
	Silicone oil (DC 200)	**A**
	Silicone oil (DC 702)	**C**
	Silicone oil (DC 704)	**D**
	Glycerin/Water	**G**
	Inert Fluid	**P**
	KTFILL-1	**L**
	Neobee M-20	**N**
	DC97 - 9120 PHARMA B-GRADE	**Q**
kl	**SYSTEM LENGTH m(feet)**	
	1 (3)	**03**
	1.5 (5)	**05**
	2 (7)	**07**
	2.5 (8)	**08**
	3 (10)	**10**
	3.5 (12)	**12**
	4 (13)	**13**
	4.5 (15)	**15**
	5 (17)	**17**
	6 (20)	**20**
	7.5 (25)	**25**
	9 (30)	**30**
	10 (35)	**35**
m	**CERTIFICATION**	
	None	**0**
	Zone "0" protection (not available with diaphragm material code 7, 8 at position "h")	**Z**
no	**OPTIONS**	
	None	**00**

N6E FLANGED EXTENDED DIAPHRAGM SEALS

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

			Code
abc	**BASE MODEL**		
	Flanged extended diaphragm seals		**N6E**
d	**NUMBER OF REMOTE SEALS**		
	Two remote seals		**2**
ef	**MOUNTING CONNECTION**	**Material**	
	3in ANSI CL150	Carbon steel	**K3**
	3in ANSI CL150	AISI 316 ss	**S3**
	3in ANSI CL300	Carbon steel	**L3**
	3in ANSI CL300	AISI 316 ss	**36**
	DN80, DIN ND 16	Carbon steel	**4C**
	DN80, DIN ND 16	AISI 316 ss	**4M**
	DN80, DIN ND 40	Carbon steel	**4D**
	DN80, DIN ND 40	AISI 316 ss	**4N**
g	**OTHER WETTED MATERIAL (Not diaphragm)**		
	AISI 316L ss		**2**
	Hastelloy C (only available with diaphragm material code 3, 8 and A at position "h")		**3**
h	**DIAPHRAGM MATERIAL**		
	AISI 316L ss		**2**
	Hastelloy C 276		**3**
	AISI 316L ss with Teflon anti-stick coating	(only available with 3in ANSI CL 150/300 connection, code K3,S3,L3,36 at position "ef")	**7**
	Hastelloy C 276 with Teflon anti-stick coating		**8**
	AISI 316L ss with Teflon coating anti-corrosion and antistick		**A**
i	**EXTENSION LENGTH**		
	2in		**2**
	4in		**4**
	6in		**6**
j	**CAPILLARY - Fill fluid**		
	Silicone oil (DC 200)		**A**
	Silicone oil (DC 702)		**C**
	Silicone oil (DC 704)		**D**
	Glycerin/Water		**G**
	Inert Fluid		**P**
	KTFILL-1		**L**
	Neobee M-20		**N**
kl	**SYSTEM LENGTH m(feet)**		
	1 (3)		**03**
	1.5 (5)		**05**
	2 (7)		**07**
	2.5 (8)		**08**
	3 (10)		**10**
	3.5 (12)		**12**
	4 (13)		**13**
	4.5 (15)		**15**
	5 (17)		**17**
	6 (20)		**20**
	7.5 (25)		**25**
	9 (30)		**30**
	10 (35)		**35**
m	**CERTIFICATION**		
	None		**0**
	Zone "0" protection (not available with diaphragm code 7 or 8 at position "h")		**Z**
no	**OPTIONS**		
	None		**00**

N6F FLANGED FLUSH DIAPHRAGM SEALS

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

		Code
abc	**BASE MODEL**	
	Flanged flush diaphragm seals	**N6F**

		Code
d	**NUMBER OF REMOTE SEALS**	
	Two remote seals	**2**

			Code
ef	**MOUNTING CONNECTION**	**Material**	
	3in ANSI CL150	Carbon steel	**K3**
	3in ANSI CL150	AISI 316 ss	**S3**
	3in ANSI CL300	Carbon steel	**L3**
	3in ANSI CL300	AISI 316 ss	**36**
	3in ANSI CL600	Carbon steel	**37**
	3in ANSI CL600	AISI 316 ss	**38**
	3in ANSI CL900	Carbon steel	**39**
	3in ANSI CL900	AISI 316 ss	**3A**
	DN80, DIN ND 16	Carbon steel	**4C**
	DN80, DIN ND 16	AISI 316 ss	**4M**
	DN80, DIN ND 40	Carbon steel	**4D**
	DN80, DIN ND 40	AISI 316 ss	**4N**
	DN80, DIN ND 64	Carbon steel	**4E**
	DN80, DIN ND 64	AISI 316 ss	**4F**
	DN80, DIN ND 100	Carbon steel	**4H**
	DN80, DIN ND 100	AISI 316 ss	**4G**
	DN80, DIN ND 160	Carbon steel	**4K**
	DN80, DIN ND 160	AISI 316 ss	**4L**

		Code
g	**OTHER WETTED MATERIAL (Not diaphragm)**	
	Same as diaphragm	**0**

			Code
h	**DIAPHRAGM MATERIAL**		
	AISI 316L serrated seat finish		**2**
	AISI 316L smooth seat finish		**L**
	Hastelloy C 276		**3**
	Tantalum (max temperature 260°C/500°F) - (NOT VACUUM)		**5**
	AISI 316L ss with Teflon anti-stick coating	(only available with 3in connection code K3,S3,L3,36,37,38,39,3A at position "ef")	**7**
	Hastelloy C 276 with Teflon anti-stick coating		**8**
	AISI 316L ss with Teflon coating anti-corrosion and antistick		**A**

		Code
i	**EXTENSION LENGTH**	
	None	**0**

		Code
j	**CAPILLARY - Fill fluid**	
	Silicone oil (DC 200)	**A**
	Silicone oil (DC 702)	**C**
	Silicone oil (DC 704)	**D**
	Glycerin/Water	**G**
	Inert Fluid	**P**
	KTFILL-1	**L**
	Neobee M-20	**N**
	DC97 - 9120 PHARMA B-GRADE	**Q**

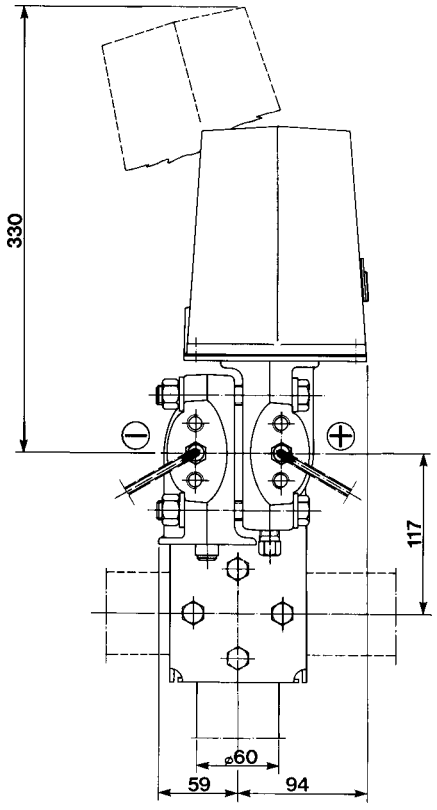
		Code
kl	**SYSTEM LENGTH m(feet)**	
	1 (3)	**03**
	1.5 (5)	**05**
	2 (7)	**07**
	2.5 (8)	**08**
	3 (10)	**10**
	3.5 (12)	**12**
	4 (13)	**13**
	4.5 (15)	**15**
	5 (17)	**17**
	6 (20)	**20**
	7.5 (25)	**25**
	9 (30)	**30**
	10 (35)	**35**

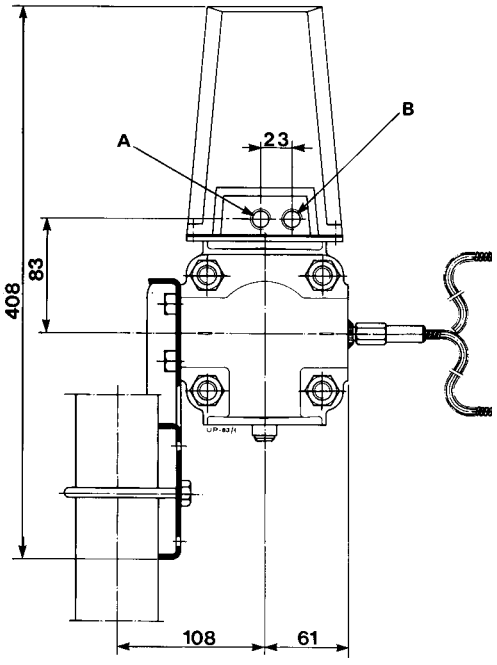
		Code
m	**CERTIFICATION**	
	None	**0**
	Zone "0" protection (not available with diaphragm code 7 or 8 at position "h")	**Z**

		Code
no	**OPTIONS**	
	None	**00**

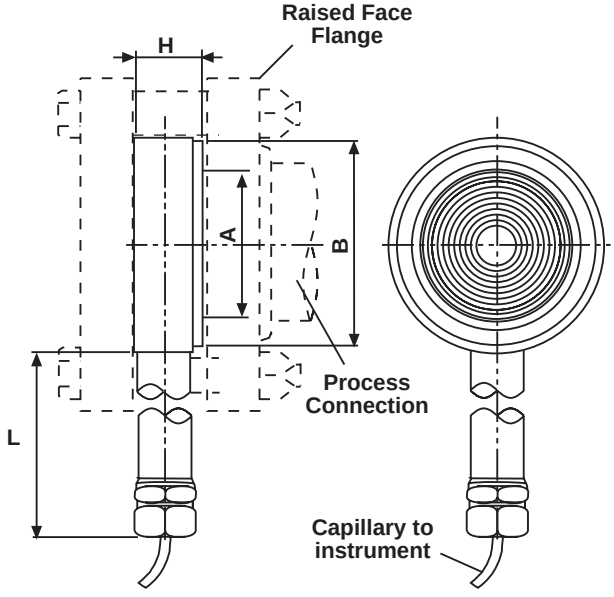
■ Compliance to NACE class II bolting, according to specification MR0175, latest revision

MOUNTING DIMENSIONS





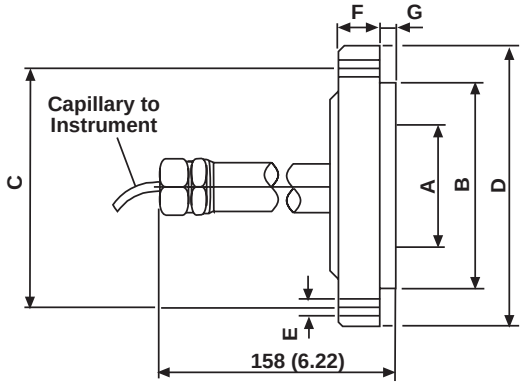
- **N6W Remote wafer seals**



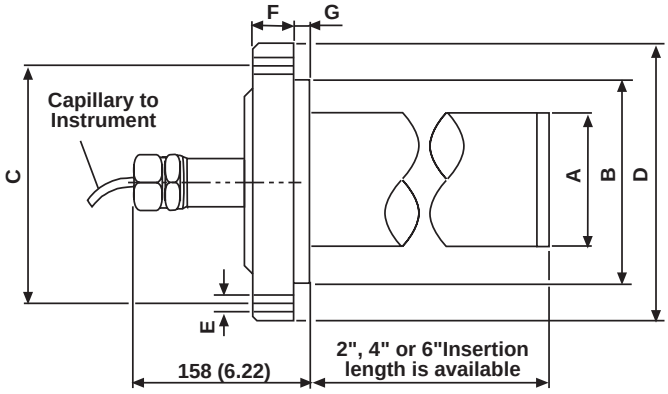
SIZE	DIMENSIONS mm (in)			
	A (dia)	B dia)	H	L
3 in	89 (3.5)	127 (5)	23 (0.9)	139.7 (5.5)
DN 80	89 (3.5)	138 (5.43)	23 (0.9)	139.7 (5.5)

Wafer seal maximum working pressure:
16 MPa, 160 bar, 2320 psi but not greater than the backup flange rating (not supplied)

- **N6F Remote flanged flush diaphragm seals**



- **N6E Remote flanged extended diaphragm seals**



SIZE/RATING	A (dia)		DIMENSIONS mm (in)						N° of holes
	flush	extended	B (dia)	C (dia)	D (dia)	E (dia)	F	G	
3in ANSI CL 150	89 (3.5)	72 (2.83)	127 (5)	152.5 (6)	190.5 (7.5)	20 (0.79)	24 (0.94)	9.5 (0.37)	4
3in ANSI CL 300	89 (3.5)	72 (2.83)	127 (5)	168.5 (6.63)	210 (8.26)	22 (0.86)	28.5 (1.12)	9.5 (0.37)	8
3in ANSI CL 600	89 (3.5)		127 (5)	168.5 (6.63)	210 (8.26)	22 (0.86)	32 (1.26)	9.5 (0.37)	8
3in ANSI CL 900	89 (3.5)		127 (5)	190.5 (7.5)	241 (9.48)	26 (1.02)	38.5 (1.51)	9.5 (0.37)	8
DN80 DIN ND16	89 (3.5)	72 (2.83)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	20 (0.79)	9.5 (0.37)	8
DN80 DIN ND40	89 (3.5)	72 (2.83)	138 (5.43)	160 (6.3)	200 (7.87)	18 (0.71)	24 (0.94)	9.5 (0.37)	8
DN80 DIN ND64	89 (3.5)		138 (5.43)	170 (6.7)	215 (8.46)	22 (0.86)	28 (1.1)	9.5 (0.37)	8
DN80 DIN ND100	89 (3.5)		138 (5.43)	180 (7.08)	230 (9.05)	26 (1.02)	32 (1.26)	9.5 (0.37)	8
DN80 DIN ND160	89 (3.5)		138 (5.43)	180 (7.08)	230 (9.05)	26 (1.02)	36 (1.42)	9.5 (0.37)	8

Flanged seal maximum working pressure:

ANSI CL 150: 2 MPa, 20 bar, 290 psi
ANSI CL 300: 5 MPa, 50 bar, 725 psi
ANSI CL 600: 10 MPa, 100 bar, 1450 psi
ANSI CL 900: 16 MPa, 160 bar, 2320 psi
DIN ND 16: 1.6 MPa, 16 bar, 230 psi
DIN ND 40: 4 MPa, 40 bar, 580 psi
DIN ND 64: 6.4 MPa, 64 bar, 930 psi
DIN ND 100: 10 MPa, 100 bar, 1450 psi
DIN ND 160: 16 MPa, 160 bar, 2320 psi

SS/NAE Rev 7

The Company's policy is one of continuous product improvement and the right is reserved to modify the specifications contained herein without notice.

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