

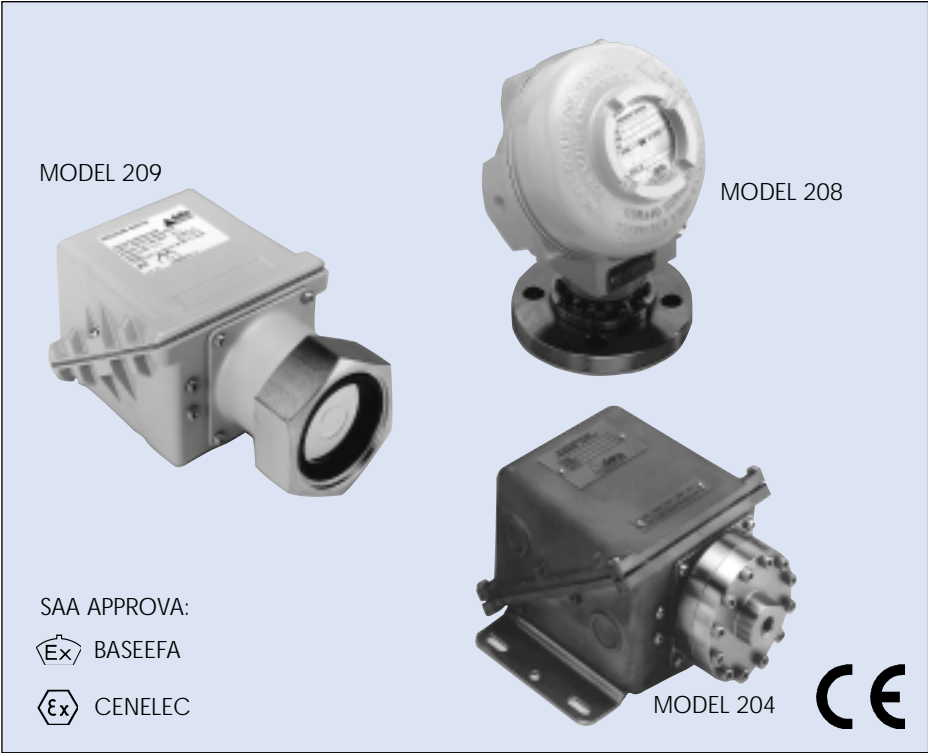
WEED INSTRUMENT

INSTRUMENTATION SOLUTIONS FOR INDUSTRY

**204/8/9
 ISSUE K**

**DIAPHRAGM OPERATED
 PRESSURE SWITCHES**

- ▲ Precision stainless steel mechanism for arduous atmospheres and high humidity.
- ▲ Set point adjustable over whole range against calibrated scale with tamperproof adjuster.
- ▲ High Overload capacity (204).
- ▲ Open diaphragm (208).
- ▲ Hygiene connection (209.)
- ▲ Weatherproof and Explosionproof models.
- ▲ Safety vented or blow-out device as standard.
- ▲ Hermetically sealed microswitch option.



HOW TO ORDER

Model 204/8/9 are diaphragm operated variants of the 200 Series offering features not obtainable on bellows operated units.

High overload capacity up to 206 bar (3000 psi) is offered by the 204 while for processes which by their physical or biological nature are incompatible with small bore pipes and standard threaded process entries. Models 208 & 209 provide flanged or hygiene connections.

The standard material for the sensing element is stainless steel. For Model 204, applications where these are unsuitable, eg. sea water and/or sour gas (NACE MR 01-75), Monel is available.

When ordering, please state the relevant product code for each instrument, made up as follows:

Enclosure. See Table 1. _____

Model. See Table 2. _____

Electrical Entry. See Table 3. _____

Material of Wetted Parts. See Table 4. _____

Range. See Table 5. _____

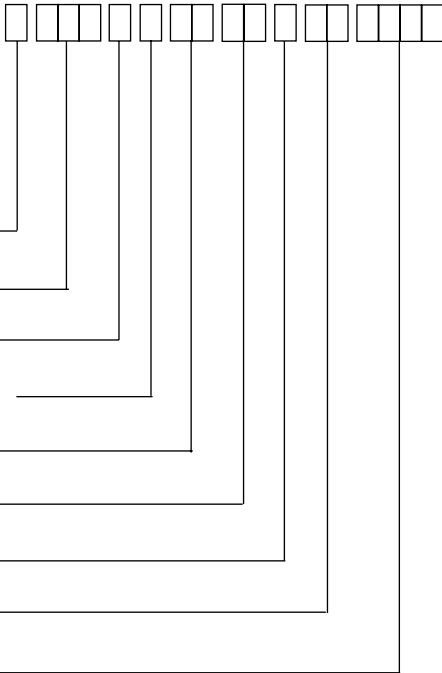
Switching Options. See Table 6. _____

Process Connection. See Table 7. _____

Options. See Table 8. _____

Special Engineering. _____

By consultation with our engineers. See Table 9.



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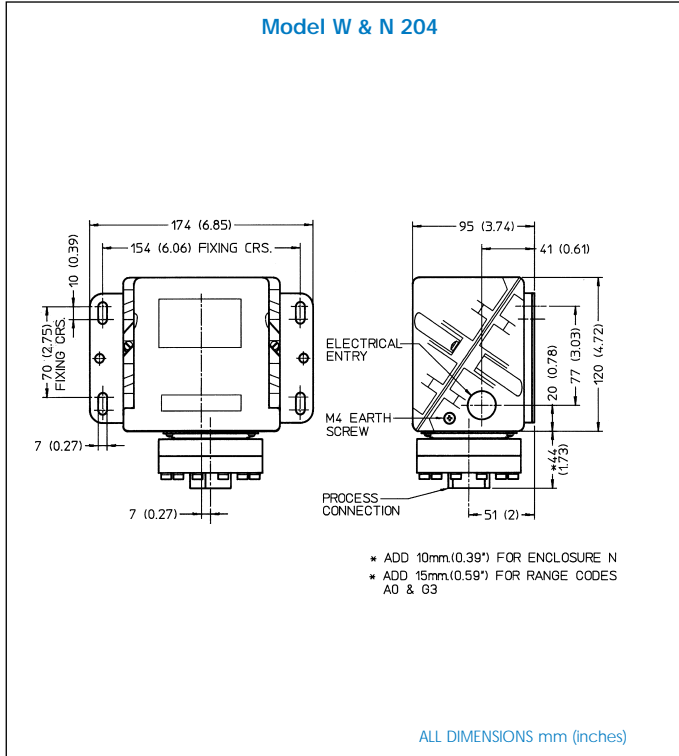
STOCK NO: 002521/204 - Dec '99



DIMENSIONS

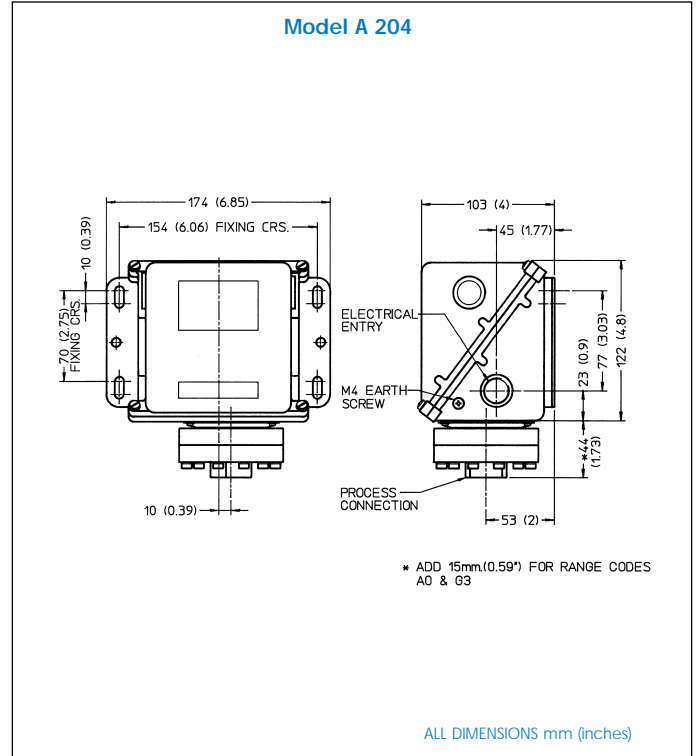
'W' & 'N' ENCLOSURES

Model W & N 204



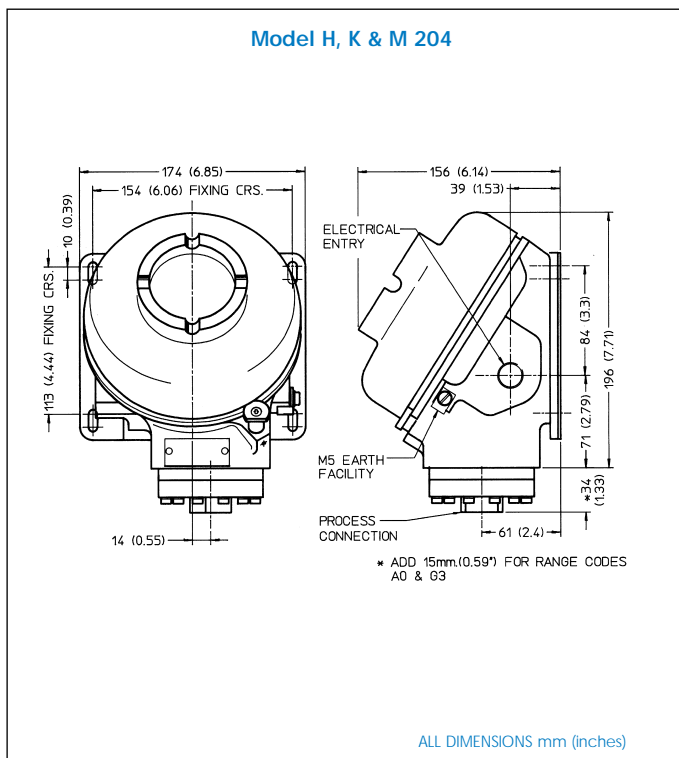
'A' ENCLOSURES

Model A 204



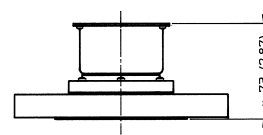
'H, K & M' ENCLOSURES

Model H, K & M 204

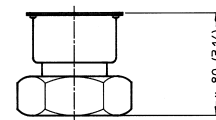


ALL ENCLOSURES

Model 208



Model 209



* ADD 10mm (0.39") FOR ENCLOSURE N

ALL DIMENSIONS mm (inches)

TECHNICAL DATA

ACCURACY

Set point repeatability $\pm 0.1\%$ of full scale at 20°C ambient.

Scale accuracy $\pm 3\%$ of full scale.

AMBIENT TEMPERATURE RANGE

All models are suitable for operating within a range of ambient temperature from -25 to +60°C (-13 to +140°F).

Special build available for temperatures down to -60°C (-76°F).

MAXIMUM PROCESS TEMPERATURE

Subject to appropriate installation practice the components parts will withstand up to +60°C (+140°F). For process temperatures up to +120°C (+248°F) order **WETTED PARTS**

*Code A (Table 4), and for higher temperatures refer to **SPECIAL ENGINEERING**.

*Applies to 204 and 209 only.

CAUTION:

Moving parts have been treated with a water repelling lubricant before leaving factory. Occasional inspection and the application of a water repelling lubricant is recommended to ensure moving parts remain free under all conditions.

WARNING: Does not apply to Oxygen Services, see Table 8.

ELECTRICAL CONNECTIONS

Terminal block

Cable entry is to a non-pinching block made of a non-hygroscopic thermosetting plastic, suitable for cables up to 2.5mm²/14AWG.

Earthing/Grounding

An earthing stud is provided inside all weatherproof enclosures, adjacent to the entry. External earthing is standard on explosionproof versions.

Dielectric Strength

The electrical assembly is capable of withstanding *2kV between live parts and earth/ground and 500V between open contacts.

*1.2kV for microswitch Codes H2, H3, and H6. Refer to Table 6.

Electrical Entry

Standard options are listed in Table 3. Pg, UNI and ET threads can be accommodated by adaptors. Dual entry available on some enclosures.

OPTIONAL EXTRAS

Chemical Seals

Chemical Seals of our own or proprietary manufacture can be fitted when required.

Mounting

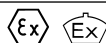
Position/Location/Installation

Vertical as shown, **in dimensions**, taking care to avoid siting in locations that transmit excessive shock or vibration. For further advice contact our engineers.

UNIT WEIGHTS (Approx)	204	208	209
'W' and 'N' enclosures	3.0kg/6.6lb	4.8kg/10.6lb	2.6kg/5.7lb
'A' enclosure	4.0kg/8.8lb	5.8kg/12.7lb	3.6kg/7.9lb
'H' enclosure	4.5kg/10.0lb	6.3kg/14.0lb	4.1kg/9.1lb
'K' enclosure	9.3kg/20.5lb	11.1kg/24.5lb	8.9kg/19.6lb
'M' enclosure	9.8kg/21.3lb	11.6kg/25.3lb	-

APPROVALS

CENELEC/BASEEFA



BASEEFA certified to CENELEC EN50 014 and EN50 018. for use in Zone 1 hazardous areas.

Enclosure Codes H and K and all models.
BASEEFA No. Ex 86B 1341

BASEEFA certified to BS 4683 Part 3. For use in ZONE 2 hazardous areas.



Enclosure Code N.
BASEEFA No. Ex 77019/B

HSE (M) certified to BS 4683. For use in group 1 (Mining) applications.
Enclosure Code M
HSE No. FLP 78011



AUSTRALIAN (SAA) APPROVAL

Standard Association of Australia
Explosion protection Electrical Equipment
Type of Protection Ex d IIC T6

Cert No. AUS Ex1137

OPTIONS AND TREATMENTS

Combinations available, apply for details.

TABLE 8



	Code
Tropicalisation High humidity environment.	01
Marine and Offshore Saline atmosphere or salt spray.	02
Ammonia Process (wetted) parts and construction suitable for atmospheric ammonia.	03
Oxygen Service 2 Process (wetted) parts are cleaned for oxygen.	04
Oxygen Service 3 Process and non process parts are cleaned for use with oxygen.	05
Stainless Steel Pipe Mounting Bracket Permits local 2" pipework to be utilised for mounting the Instrument.	10
Tagging - Variety of tagging methods are available	APPLY FOR DETAILS
Applies when - no option is required and selection is made from special engineering.	00

SPECIAL ENGINEERING

To your individual requirements, where specified.

For your convenience, enter your special listing in space provided.

TABLE 9



FEATURE	Code

PERFORMANCE DATA

BAR UNITS (SI)

TABLE 10A ALL MODELS
FIXED SWITCHING DIFFERENTIAL

TABLE 10

mbar units **TABLE 10A**

Range Code	Range mbar / bar	SPDT OPTIONS					DPDT OPTIONS				
		00	02	04	08/0G	H2	01	03	05	09/0H	H3/H6
AO	-1000 to 0	50	150	50	125	125	100	200	100	200	190
G3	-1 to +1.5	100	300	100	250	250	200	300	200	375	375
E8	50 to 350	15	45	15	30	30	30	60	30	45	45
G7	0.3 to 1.5	30	100	30	100	100	60	120	60	150	150
J0	0.7 to 4	70	200	70	270	270	140	280	140	350	405
M2	0.7 to 7	100	300	100	650	650	200	400	200	1000	975
P8	1.5 to 15	200	600	200	1000	1000	400	800	400	1500	1500

PSI UNITS

TABLE 10B ALL MODELS
FIXED SWITCHING DIFFERENTIAL

Due to manufacturing tolerances the figures quoted in these tables are for guidance only and are typical for weatherproof models.

Explosionproof models may be up to 2 times higher depending on the range. Should the differential be critical for specific applications our engineers should be consulted prior to ordering.

in.Hg/PSI units **TABLE 10B**

Range Code	Range in.Hg/ psi	SPDT OPTIONS					DPDT OPTIONS				
		00	02	04	08/0G	H2	01	03	05	09/0H	H3/H6
AB	-30 to 0	1.5	4.5	1.5	3.8	3.8	3.0	6.0	3.0	6	5.6
GK	-14.5 to +20	1.5	4.5	1.5	3.8	3.8	3	4.5	3	6	6
E7	1 to 5	0.2	0.7	0.2	0.45	0.45	0.5	0.9	0.5	0.7	0.7
GT	4 to 20	0.5	1.5	0.5	1.5	1.5	0.9	1.7	0.9	2.3	2.3
J7	10 to 60	1	3	1	4.0	4.0	2	4	2	5	6.5
M8	10 to 100	1.5	4.5	1.5	10	10	3	6	3	15	14.5
PK	20 to 200	3	9	3	15	15	6	12	6	22	22

SWITCHING OPTIONS

TABLE 6



A much wider variety of switching options can be engineered to customers requirements including heavy DC, manual latching, pneumatic output etc. Please consult our engineers for further information.

* Suitable for use with ExN Enclosures (Code N)

All Models										
UL/CSA RATING (RESISTIVE) §SEE NOTE	IEC 947-5-1/EN 60947-5-1 RATING								Contact	Code
	Designation & Utilization Category		Rated operational current I_e (A) at rated operational voltage U_e	U_i	U_{imp}	VA rating				
						AC	Make	Break		
5 Amps @ 110/250V AC Light Duty for AC only	AC14 DC13	D300 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.8kV	AC DC	432 28	72 28	SPDT DPDT	00 01
5 Amps @ 110/250V AC and 2 Amps @ 30V DC General purpose precision	AC14 DC13	D300 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.8kV	AC DC	432 28	72 28	SPDT DPDT	02 03
1 Amp @ 125V AC and §100 mA @ 30V DC gold alloy contacts for low voltage switching	1A @ 125 VAC RESISTIVE (IEC 1058-1/EN 61058-1)								SPDT DPDT	04 05
§5 Amps @ 110/250V AC and 5 Amps @ 30V DC Environmentally sealed	AC14 DC13	D300 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.5kV	AC DC	432 28	72 28	SPDT* DPDT*	08 09
§1 Amp @ 30V AC and 30V DC Environmentally sealed with gold contacts	AC14	E150	0.3A @ 120V AC	125V	0.5kV	AC	216	36	SPDT* DPDT*	0G 0H
5 Amps @250V AC and 2 Amps @ 30V DC Hermetically sealed. Gold plated silver contacts	AC14 DC13	D300 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.5kV	AC DC	432 28	72 28	SPDT DPDT	H2 H3†, H6‡

†1 Single pole, double throw. simultaneous falling under pressure.

‡2 Single pole, double throw. simultaneous rising under pressure.

The electrical rating is dependent on the microswitch fitted to the instrument. The electrical ratings defined by each approval that the micro switch complies with and is shown on the product nameplate, ie UL/CSA, or IEC. It should be noted that the instrument must be used within the electrical rating specified from the approval you require. This table lists the actual IEC ratings against the Designation & Utilization Category marked on the nameplates. In the absence of any verification by UL/CSA the microswitch §manufacturer's rating is stated in **italics and bold**. **If in doubt seek guidance from the factory.**

NOTE: For low energy circuits e.g. 30V and up to 100mA, we recommend using gold alloy contact switches.

U_i = rated insulation voltage:

U_{imp} = rated impulse withstand voltage across contacts.

PROCESS CONNECTION

TABLE 7



For Model 204

Other thread specifications and sizes are available without using adaptors.

Adaptors are available for applications where their use is permitted.

Model 204	Code
Rc 1/4 (1/4 BSP tr INTERNAL) to BS21 (ISO 7/1)	A
1/4 - 18 NPT INTERNAL	F
1/2 - 14 NPT INTERNAL	H
1/2 - 14 NPT EXTERNAL	J

Model 208	Code
BS4504 PN 16. DN50	5
ANSI B16.5 2in CLASS 150.RF	6

Model 209	Code
IDF. 2in with nut and gasket to BS4825 ISO2853. (Not range E8.)	7
IDF. 2.5in with nut and gasket to BS4825 ISO2853. (Range E8 only.)	8

ELECTRICAL ENTRY

Adaptors are available for other popular thread sizes.

MATERIAL OF WETTED PARTS

For Model 208 range of operation chosen must be compatible with pressure/temperature rating of flange, refer to appropriate flange standard.

SETTING RANGES

Maximum Working Pressure:
 Model 204, 206 bar (3000 psi)
 Model 208. limited by flange rating
 Model 209, 20 bar (300 psi)

NOTE: For SI units, the bar and millibar have been employed. This follows European and British practice where the Pascal and its multiples have largely been discontinued. Pa kPa and MPa scales are available if required.

1 bar = 100kPa = 14.5 psi
 1mbar = 100Pa = 0.39 in.H₂O

TABLE 3

	Code
Enclosures W & N: Clearance for 20mm/ ³ / ₄ in outside dia conduit.	1
Enclosures H, K & A: M20 x 1.5 ISO thread.	0
Enclosures H & K: M20 x 1.5 ISO thread, dual entry.	5
Enclosures H & K ³ / ₄ - NPT INT.	3
Enclosures H & K: ³ / ₄ - NPT INT, dual entry.	6
Enclosure W: M20 x 1.5 elbow adaptor.	0
Enclosure N: M20 x 1.5 straight adaptor. (Approved)	0
Enclosure M: Cable size and type must be specified.	*

*Code on application.

TABLE 4

Model		Code
204 209	316 stainless steel diaphragm, process connection and viton O-ring seal	A
204	316 stainless steel diaphragm, process connection and nitrile O-ring seal	G
204	Nickle alloy (Monel) diaphragm. All other wetted parts 316 stainless steel and nitrile seals	P
	For wetted parts required to conform with Sour Gas or Sour Crude applications as laid down in NACE standard MR-01-75	K
208	316 Stainless steel wetted parts and P.T.F.E. seals.	F

TABLE 5

RANGE			Code
mbar/bar	Code	in Hg/psi	
-1000 to 0	A0	-30 to 0	AB
-1 to +1.5	G3	-14.5 to +20	GK
50 to 350	E8	1 to 5	E7
0.3 to 1.5	G7	4 to 20	GT
0.7 to 4	J2	10 to 60	J7
0.7 to 7	M2	10 to 100	M8
1.5 to 15	P8	20 to 200	PK

ENCLOSURES

FINISH







All enclosures except Type A are finished in light grey epoxy resin paint. Special finishes to order.

INTRINSIC SAFETY

Pressure switches neither store nor generate electricity and are therefore normally usable in intrinsically safe circuits without further certification, provided that the power source of the circuit is certified Exi and the installation is in accordance with the relevant codes of practice (eg ANSI/ISA 12.6 or BS 5345 Part 4, 1977). Because of the low voltages and currents of I.S. circuits, we recommend using gold and/or sealed contacts.

Temperatures in Table 1 refer to limitations for certified enclosures. See **TECHNICAL DATA**.

TABLE 1

SAFE AREA ENCLOSURES		Code
General Purpose Weatherproof The basic enclosure is pressure die-cast in zinc alloy, offering weather protection not less than NEMA type 4 + 13/IP66.		W
Weatherproof For Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel with weather protection not less than NEMA type 4X + 13/IP66. The finish is natural glass bead blasted.		A
EXPLOSIONPROOF ENCLOSURES DIVISION 1 (ZONE 1)		
Aluminum Alloy EExd IIC T6 (-60 to +40°C), T4 (-60 to +80°C) Gravity die-cast enclosure in aluminium-silicon alloy. BASEEFA certified to CENELEC EN50 014 and EN50 018 Suitable for outdoor use, IP66. N.B. Electrical Entry must be specified since usage differs between CENELEC countries.	 	H
Australian Approval Exd IIC T6 (-60 to +40°C)	SAA	
Cast Iron EExd IIC T6(-60 to +40°C), T4 (-60 to +80°C) As Code H, but sand cast in high quality grey iron.	 	K
Australian Approval Exd IIC T6 (-60 to +40°C)	SAA	
Many countries have a separate approvals system for underground mining use. For the UK we offer approval by HSE(M). Group 1 Temperature class T6, plus weather protection IP55. Cast Iron Only.		M
ExN ENCLOSURES DIVISION 2 (ZONE 2)		
Type of Protection ExN II T6 (-20 to +40°C) As Code 'W' but BASEEFA certified to BS 4683 Part 3 ExN II T6. Weatherproof to NEMA type 4/IP66. Limited switching facility (see Table 6).		N

MODELS

TABLE 2

	Code
High Overload Capacity High sensitivity over the operating range while permitting continuous application at very high pressure.	204
Open Diaphragm Direct mounting flanged connection for fluids or processes likely to block conventional sensing elements.	208
Hygiene Connection Direct mounting crevice free connection for food, brewing or other biologically active processes.	209