

## Performance Diaphragm Operated Pressure Switches **200 Series**

204 / 8 / 9  
Issue L

- 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 Flameproof models EEx d IIC - ATEX.
- Safety vented or blow out device as standard.
- Hermetically sealed microswitch option.



### Performance characteristics

#### Enclosure

- IP66 Protection

#### Wetted parts options

- 316 Stainless Steel diaphragm with Viton O ring seals.
- 316 Stainless Steel diaphragm with Nitrile O ring seals.
- Nickel Alloy (Monel) suitable for NACE MR-01-75.

#### Standard Electrical ratings

- Refer to table 6

#### Process connection

- Rc ¼ (BSP), ¼ NPT Internal, ½ NPT Internal & External (204).
- Flanges - EN1092-1 (BS4504) PN 16. DN50 & ANSI B16.5 2in 150RF (208).
- IDF. 2in and 2.5in to ISO2853 BS4825 (209).

#### Unit weight

- Between 2.6kg – 11.1kg (5.7lb – 24.5lb)

#### Accuracy

- Set point repeatability  $\pm 1\%$  of span at 20 °C / 68 °F ambient.
- Scale accuracy  $\pm 3\%$  of full scale.

### Product applications

The 204 is suitable for a wide range of applications in many Industry sectors:

- Oil & Gas
- Chemical
- Petrochemical
- Refining
- Power
- Food Industry

The choice of models available ensures that the 204/8/9 is suitable for use in:

- Corrosive atmospheres
- Resistant to chemical attack

### How can we help you?

Delta Controls' range of reliable pressure and temperature measurement instruments can be customised to meet individual requirements. For technical advice or to discuss your application please contact us on +44 (0) 20 8939 3500

## Enclosure

TABLE 1





### FINISH

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

### INTRINSIC SAFETY

Because of the low voltages and currency 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**.

WEATHERPROOF ENCLOSURES	Code
<b>General Purpose</b> The basic enclosure is pressure die-cast in zinc alloy, offering weather protection not less than NEMA 4 + 13/IP66.	W
<b>For Aggressive Atmospheres</b> Investment cast enclosure in austenitic stainless steel with weather protection not less than NEMA 4X + 13/IP66.	A
FLAMEPROOF ENCLOSURES CATEGORY 2 (ZONE 1)	
<b>EExd IIC T6 (-60 to + 40°C), T4 (-60 to +80°C) 11 2 G D</b> Gravity die-cast enclosure in aluminium-silicon alloy, certified to CENELEC EN50 014 and EN50 018.  II 2 G D Suitable for outdoor use, IP66 / NEMA 4	H
IECEX Exd IIC certified to IEC 60079-0 and IEC60079-1	
<b>EExd IIC T6 (-60 to + 40°C), T4 (-60 to +80°C) 11 2 G D</b> As Code H, but sand cast in high quality grey iron.  II 2 G D	K
IECEX Exd IIC certified to IEC 60079-0 and IEC 60079-1	
EExn ENCLOSURES CATEGORY 3 (ZONE 2)	
<b>Type of Protection EExn II T6 (-20 to +40°C) II 3 G</b> As code 'W' but EExn to EN50021. Weatherproof to NEMA 4/IP66. <b>Limited switching facility (see table 6)</b>	N
As 'N' but with investment cast enclosure in austenitic stainless steel as 'A'.	O

## Models

TABLE 2



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

## Electrical Entry

Adaptors are available for other popular thread sizes.

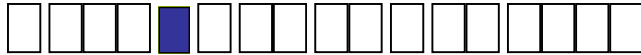
### Enclosures 'W' and 'N'

Standard option code 1 (22mm dia) is provided with a nylon 22/20 reducer and fibre washer suitable for a standard M20 cable gland and back nut. Option code 0 elbow adaptor is factory fitted. Adapter kits may also be provided retrospectively to fit at site if required. Ask for details. See diagrams for dimensions.

### 'W' and 'N' SAFETY NOTE

If a metal cable gland is site fitted it must either be earthed locally or an earth/gland plate must be used to connect the body of the gland at the enclosure earthing point. Earth/gland plates can be provided either factory fitted or in kit form for site assembly.

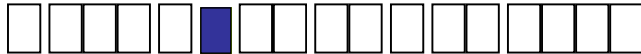
TABLE 3



	Code
Enclosure W & N: Clearance for 20mm (3/4 in) outside dia conduit.	1
Enclosures H, K, A & O: M20 x 1.5 ISO thread.	0
Enclosures H & K: M20 x 1.5 ISO thread, dual entry.	5
Enclosures H & K: 1/2" NPT Internal	2
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

## Material of Wetted Parts

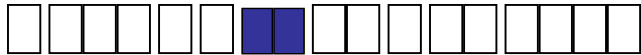
TABLE 4



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
	Nickel 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

## Setting Ranges

TABLE 5



$P_{max}$  = maximum working pressure

Model 204, 206 bar (3000 psi)  
 \*Model 208, limited by flange rating. Range of operation chosen must be compatible with pressure/temperature rating of flange, refer to appropriate flange standard.

Model 209, 20 bar (300 psi)  
 \* Unsuitable for use below 0 gauge pressure.

RANGE			
mbar / bar	Code	in Hg / psi	Code
-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

## Switching Options

TABLE 6

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

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				
					Make	Break			
5 Amps @ 110/250V AC Light Duty for AC only	AC14 D300 DC13 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.8kV	432 28	72 28	SPDT DPDT	00 01	
5 Amps @ 110/250V AC & 2 Amps @ 30V DC General purpose precision	AC14 D300 DC13 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.8kV	432 28	72 28	SPDT DPDT	02 03	
1 Amp @ 125V AC & §100mA @ 30V DC gold alloy contacts for low voltage switching	1 A @ 125 VAC RESISTIVE (IEC 1058-1/EN 61058-1)						SPDT DPDT	04 05	
§ 5 Amps @ 110/250V AC & 5 Amps @ 30V DC Environmentally sealed.	AC14 D300 DC13 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.5kV	432 28	72 28	SPDT* DPDT*	08 09	
§ 1 Amp @ 30V AC & 30V DC Environmentally sealed with gold contacts	AC14 E150	0.3A @ 120V AC	125V	0.5kV	216	36	SPDT* DPDT*	0G 0H	
5 Amps @ 250V AC and 2 Amps @ 30V DC Hermetically sealed. Gold plated silver contacts.	AC14 D300 DC13 R300	0.6/0.3A @ 120/240V AC 0.22/0.1A @ 125/250V DC	250V	0.5kV	432 28	72 28	SPDT* DPDT*	H2 H3†, H6‡	

† 2 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 microswitch 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.

\*Suitable for use with EExn Enclosures (Code N & O see Table 1)

## 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.

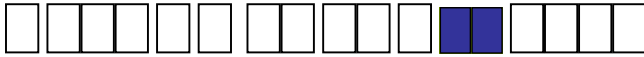
Model 204	Code
Rc 1/4 (1/4 BSP tr INT) to ISO 7/1	A
1/4 – 18NPT INT	F
1/2 – 14NPT INT	H
1/2 – 14NPT EXT	J

Model 208	Code
EN 1092-1 (BS4504) PN 16 DN50	5
ANSI B16.5 2in CLASS 150 RF	6

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

## Options & Treatments

TABLE 8



Combinations available, apply for details.

	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" pipe work 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

TABLE 9



FEATURE	Code
Please consult Delta sales engineering for special requirements.	TBA

## Performance Data

TABLE 10

### Bar Units (SI)

ALL MODELS

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
A0	-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

TABLE 10A  
ALL MODELS FIXED SWITCHING DIFFERENTIAL

### PSI Units

ALL MODELS

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

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.

Flameproof 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.

## Technical Specifications

### ACCURACY

Set point repeatability  $\pm 1\%$  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 component parts will withstand +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.

### ELECTRICAL CONNECTIONS

#### Terminal Block

Cable entry is to a non-pinching block made of a non-hygroscopic thermosetting plastic, suitable for cables up to 2.5mm<sup>2</sup>/14AWG.

#### Earthing/Grounding

An earthing stud is provided inside all weatherproof enclosures, adjacent to the entry. External earthing is standard on flameproof versions. Safety note see Table 3.

#### Dielectric Strength

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

\*1.2kV for micro switch Codes H2, H3 and H6. Refer to Table 6.

#### Electrical Entry

Standard options are listed in Table 3. Other 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.

#### Pollution degree (EN60947-5-1)

All products are suitable for use in pollution degree 3. For extreme conditions where condensation may readily form, then sealed contacts should be used. See Table 6 codes 08/09, 0G/0H, H2/H3/H6.

**Electrical Isolation** – These products are not suitable for electrical isolation. Always isolate circuit separately to carry out any electrical work.

UNIT WEIGHTS (APPROX)	204	208	209
'W' & 'N'	3.0kg/6.6lb	4.8kg/10.6lb	2.6kg/5.7lb
'A' & 'O'	4.0kg/8.8lb	5.8kg/12.7lb	3.6kg/7.9lb
'H'	4.5kg/10.0lb	6.3kg/14.0lb	4.1kg/9.1lb
'K'	9.3kg/20.5lb	11.1kg/24.5lb	8.9kg/19.6lb

## Approvals

### INTRINSIC SAFETY

Because of the low voltages and currents of intrinsically safe circuits, we recommend using gold contacts. Refer to Table 6.

### CENELEC/ATEX II 2 G D

Certified to CENELEC EN50 014 and EN50 018.

For use in Zone 1 hazardous areas EEx d IIC T6 (-60° to +40°C)  
T4 (-60° to +80°C)



Enclosure Codes H and K and all models (see Table 1)

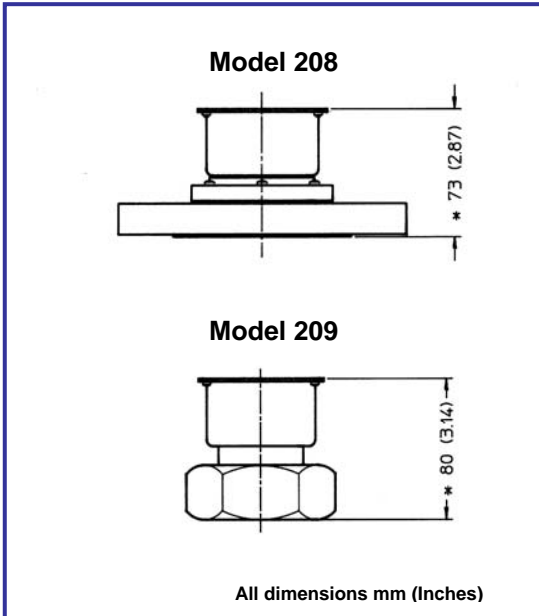
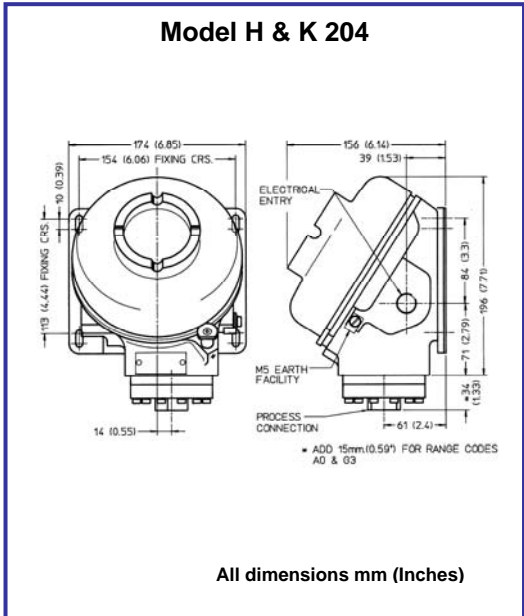
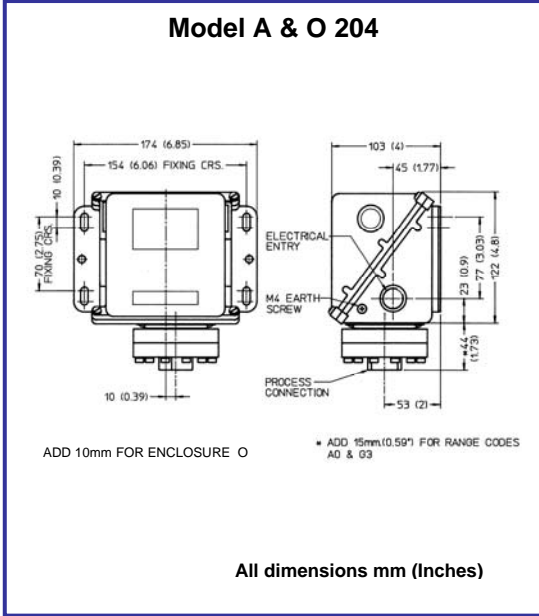
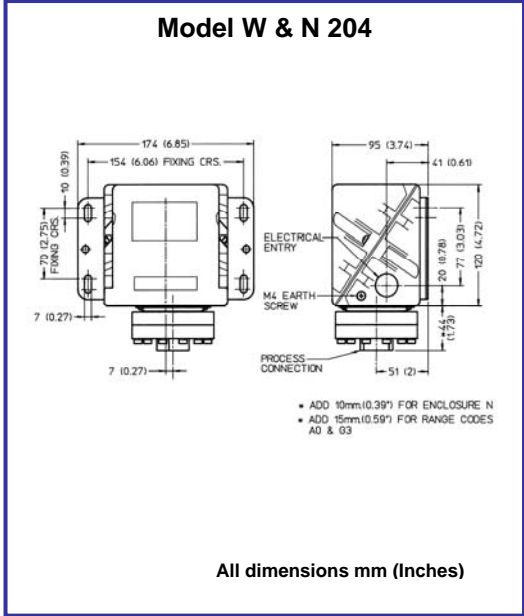
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IECEX APPROVAL for use in Zone 1 hazardous areas

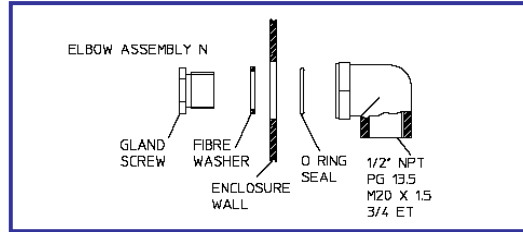
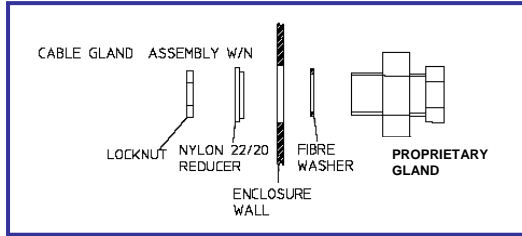
Exd IIC certified to IEC 60079-0 and IEC 60079-1

Cert No. IECExITS04 0006X

# Dimensions



## Dimensions



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