

Technical Datasheet



Compact Series Pressure Switch

Models: CS2 & CS4

Key Features

- Compact and rugged design.
- Stainless steel weatherproof enclosure IPX6
- Hermetically sealed SPDT or DPDT microswitch
- ATEX / IECEx Flameproof Ex d.
- ATEX / IECEx Intrinsically Safe Ex ia.
- High over-range models up to 1000 bar / 15,000 psi.
- Ranges available between 0.25 - 700 bar (4 - 10,000 psi).
- NACE compliant wetted parts options
- Field adjustable set-point.



Product applications

The CS Series is suitable for a wide range of applications in:

- Wellhead Control
- Hydraulic Power Units
- Chemical Injection Skids
- All panel applications where compact hazloc switches are needed

The choice of models available ensures that the CS Series is

suitable for use in:

- Corrosive atmospheres
- Resistant to chemical attack

Series Overview

- The Compact Series switch has been designed to meet the specific requirements of panel applications, whether they be of the Wellhead Control, Hydraulic Power Unit or Chemical Injection Skid type.
- Their compact, rugged, all stainless steel construction make them especially useful in the cramped and harsh environmental conditions that these applications demand. Supplied as standard with hermetically sealed switch contacts and with field adjustable set-points up to 700bar, the Compact Series Switches also come with either Intrinsically Safe or Flameproof approvals for use in Zone 0 or Zone 1 hazardous areas respectively.

How can we help you?

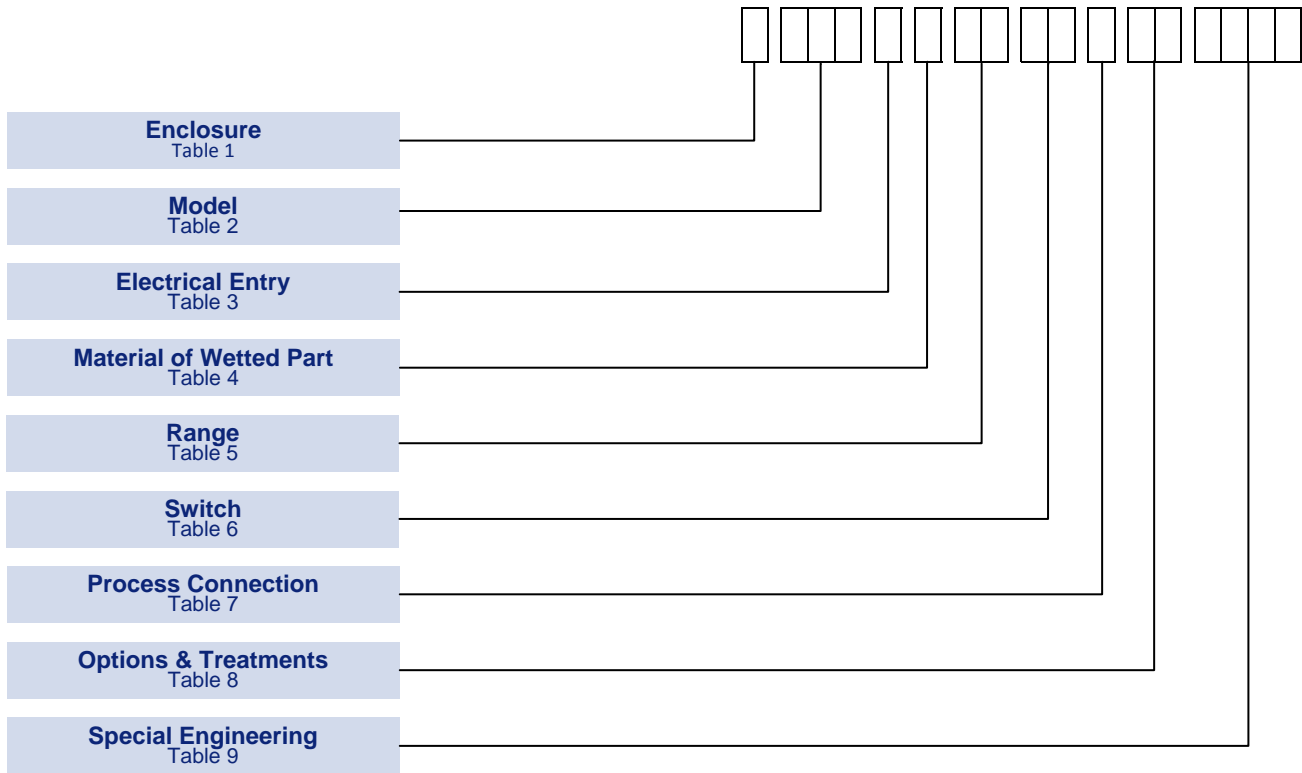
Delta Controls' offers fast, efficient and knowledgeable support when and where you need it. Please visit our web site at www.delta-controls.com to find your local support centre or call us on:

+44 (0)1252 729140

Compact Series
Models: CS2, CS4

How to order

Switches can be configured by selecting codes representing the desired features from the tables that follow. The chart below, describes how the model code is built up. For assistance in configuring a switch that best suits your needs, please contact your local sales office.



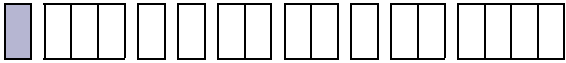
NOTE: Options shaded in the following tables are the most common options and are available on the quickest lead-times and at the lowest cost.

NOTE: Only the most common options are shown in this data sheet. Should you require a feature that is not shown, please contact your local sales office for further details.

Technical Specification


Compact Series Models: CS2, CS4	Accuracy:	Set point repeatability ± 1% of span at 20°C / 68°F
	Storage Temperature:	-40°C to +60°C / -40°F to +140°F
	Ambient Temperature:	-40°C to +85°C / -40°F to 185°F (weatherproof model) -40°C to +45°C / -40°F to 113°F (flameproof model) -40°C to +60°C / -40°F to 140°F (intrinsically safe model)
	Maximum Process Temperature:	Up to 120°C dependent on wetted parts selection (see table 4)
	Enclosure classification:	IPX6
	Switch output:	SPDT or DPDT snap action hermetically sealed microswitch
	Electrical rating:	See Table 6
	Process Connection:	¼ NPT Internal, 1/2 NPT Internal, 1/2 NPT External
	Weight:	0.6kg / 1.32lbs to 2kg / 4.4lb depending on model

Enclosure

TABLE 1 

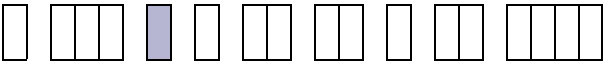
	Code
Stainless Steel Weatherproof Enclosure IPX6 For outdoor aggressive atmospheres	A
Stainless Steel Flameproof Enclosure ATEX / IECEx approved for use in Zone 1 and Zone 21 hazardous locations. See approvals section for full details.	R
Stainless Steel Intrinsically Safe Enclosure ATEX / IECEx approved for use in Zone 0 hazardous locations. See approvals section for full details.	4

Models

TABLE 2 

	Code
Pressure Switch with Fixed Switching Differential For applications up to 100 bar / 1500 psi Over-range up to 155 bar / 2250 psi Refer Table 5	CS2
Pressure Switch with Fixed Switching Differential For applications up to 700 bar / 10,000 psi Over-range up to 1000 bar / 15,000 psi Refer Table 5	CS4

Electrical Entry

TABLE 3 

	Code
Factory Sealed Flying Lead. 0.45m/18in long flying lead. With 1/2– 14 NPT external conduit thread.	A
Multicore Cable. 1.5m/60in long multicore cable. With 1/2– 14 NPT external conduit thread.	O

Compact Series
Models: CS2, CS4

Material of Wetted Parts

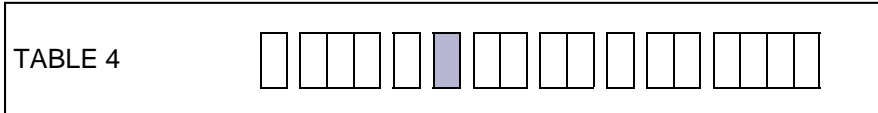
WELDED CONSTRUCTION

Codes S and T

For reduced risk against leakage under extreme or unusual conditions, the diaphragm may be welded directly to the process connection, eliminating the O-ring.

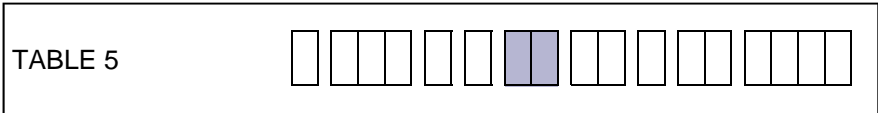
Maximum process temperature

For code G & P: 60°C
For code A, K, S & T: 120°C



	Code
316 stainless steel diaphragm and process connection with Viton O-ring seal.	A
316 stainless steel diaphragm and process connection with Nitrile (Buna-N) O-ring seal.	G
Nickel alloy (Monel) diaphragm and 316 stainless steel process connection with Viton O-ring seal for applications as laid down in NACE MR 01-75.	K
Nickel alloy (Monel) diaphragm and 316 stainless steel process connection with Nitrile (Buna-N) O-ring seal.	P
316 stainless steel diaphragm and process connection. All welded construction.	S
Nickel alloy (Monel) diaphragm and process connection. All welded construction (suitable for NACE MR 01-75).	T

Setting Ranges



5A: SI Units

Due to manufacturing tolerances the figures quoted in these tables are for guidance only.

Should the switching differential be critical for specific applications, our engineers should be consulted prior to ordering

MODEL	RANGE CODE	P _{max} Bar	RANGE bar	SWITCHING DIFFERENTIAL—Refer table 6 mbar					
				HS	HD/HR	HP	HQ/HT	HV	HW/HY
CS2	DB	27	0.25 to 1.6	200	260	80	104	200	260
	DC		0.4 to 2.5	320	416	128	166	320	416
	DE		1.0 to 6	280	364	206	268	280	364
	EA	70	1.6 to 10	430	450	300	390	430	450
	EB		2.5 to 16	570	741	228	297	570	741
	EC	112	4.0 to 25	1200	1560	480	624	1200	1560
ED	10 to 40		2700	3500	1200	1560	2700	3500	
EF	16 to 75		3200	4160	1280	1664	3200	4160	
FA	155	10 to 100	4300	5600	1720	2236	4300	5600	
CS4	DB	600	0.25 to 1.6	260	340	200	260	260	340
	DC		0.4 to 2.5	330	429	250	325	330	429
	DE		1.0 to 6	880	1144	680	885	880	1144
	EA		1.6 to 10	600	780	463	603	600	780
	EB		2.5 to 16	1300	1690	1000	1300	1300	1690
	EC		4.0 to 25	1900	2470	1500	1950	1900	2470
	ED		10 to 40	4200	5460	2200	2860	4200	5460
	EF		16 to 75	4300	5590	3300	4300	4300	5590
	FA	10 to 100	6500	8450	5000	6500	6500	8450	
	U7	1000	7 to 160	9400	12220	7300	9500	9400	12220
V7	25 to 250		16000	20800	9000	11700	16000	20800	
W7	50 to 400		22000	28600	17000	22100	22000	28600	
Y4	100 to 700		37400	48620	30000	39000	37400	48620	

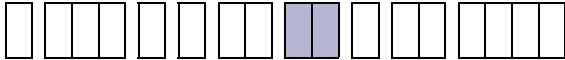
5B: PSI Units

Due to manufacturing tolerances the figures quoted in these tables are for guidance only.

Should the switching differential be critical for specific applications, our engineers should be consulted prior to ordering

MODEL	RANGE CODE	P _{max} psi	RANGE psi	SWITCHING DIFFERENTIAL—Refer table 6					
				psi					
				HS	HD/HR	HP	HQ/HT	HV	HW/HY
CS2	DK	400	4 to 25	2.9	3.8	1.2	1.5	2.9	3.8
	DP		6 to 40	4.6	6	1.9	2.4	4.6	6
	DZ		16 to 100	4.1	5.3	3	3.9	4.1	5.3
	EH	1000	25 to 160	6.2	6.5	4.4	5.7	6.2	6.5
	EM		40 to 250	8.3	10.8	3.3	4.3	8.3	10.8
	ER	1600	60 to 400	17	23	7	9	17	23
	EW		160 to 600	39	51	17	23	39	51
	EE		250 to 1000	46	60	19	24	46	60
	F6	2250	160 to 1500	62	81	25	32	62	81
	CS4	DK	8700	4 to 25	3.8	4.9	2.9	3.8	3.8
DP		6 to 40		4.8	6.2	3.6	4.7	4.8	6.2
DZ		16 to 100		13	17	10	13	13	17
EH		25 to 160		9	11	7	9	9	17
EM		40 to 250		19	25	15	19	19	25
ER		60 to 400		28	36	22	28	28	36
EW		160 to 600		61	79	32	41	61	79
EE		250 to 1000		62	81	48	62	62	81
F6		160 to 1500		94	123	73	94	94	123
UK		15000		100 to 2300	136	177	106	138	136
VC			350 to 3500	232	302	131	170	232	302
W9			800 to 6000	319	415	247	321	319	415
YF			1600 to 10000	543	705	435	566	543	705

Switch Options

TABLE 6 

The switch contacts are hermetically sealed inside a stainless steel enclosure for protection against aggressive and corrosive atmospheres.

UL/CSA RATING	IEC947-5-1 / EN 60947-5-1 RATING						Contact	Code
	Designation & Utilisation Category	Rated operational current <i>I_e</i> (A) At rated operational voltage <i>U_e</i>	<i>U_i</i>	<i>U_{imp}</i>	VA Rating			
					Make	Break		
11 Amps @ 110/250V AC and 5/0.5 Amps @ 30V DC Silver contacts	AC14 D300	0.6/0.3A @ 120/240 V AC	250V	800V	432 28	72 28	SPDT	HS
	DC13 R300	0.22/0.1A @ 125/250V DC					DPDT	HD † HR ‡
5 Amps @ 250V AC and 2 Amps @ 30V DC Silver contacts with gold flash	AC14 D300	0.6/0.3A @ 120/240 V AC	250V	500V	432 28	72 28	SPDT	HP
	DC13 R300	0.22/0.1A @ 125/250V DC					DPDT	HQ † HT ‡
1 Amp @ 125V AC and 1 Amp @ 30V DC Gold Alloy contacts—see note	AC14 E150	0.3A @ 120VAC	125V	500V	216	36	SPDT	HV
							DPDT	HW †
							DPDT	HY ‡

† 2 Single pole, double throw, simultaneous falling under pressure
‡ 2 Single pole, double throw, simultaneous rising under pressure

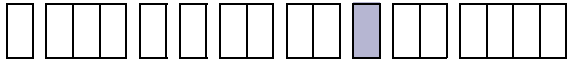
NOTE: For low energy circuits e.g. 30V and up to 100mA, we recommend using gold alloy contact switches.
NOTE: For Enclosure codes 4, HS, HD and HR switching codes are unsuitable. Use gold contact switches.
U_i = rated insulation voltage *U_{imp}* = rated impulse to withstand voltage across contacts.

Compact Series
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Process Connection

Other thread specifications and sizes are available without using adaptors.

Adaptors are available for applications where their use is permitted. Apply for details.

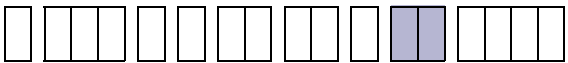
TABLE 7 

	Code
1/4—18 NPT INTERNAL	F
1/2—14 NPT INTERNAL*	H
1/2—14 NPT EXTERNAL	J

*Not recommended for use over 600 bar/8700 psi. Refer to Table 5A & 5B.


Options & Treatments

Combinations available, apply for details.

TABLE 8 

	Code
No options or Treatments Use this code when Special Engineering is required without options and treatments	00
Tag number permanently etched onto enclosure	20
Tag Stainless steel tied to enclosure	30

Special Engineering

TABLE 9 

	Code
Please consult Delta sales engineering for special requirements	TBA

Approvals

EUROPEAN



Low voltage Directive (LVD) 2006/95/EC.
Compliant to LVD


Pressure Equipment Directive (PED) 97/23/EC:

This product has a process connection size \leq DN25 and is therefore categorised as sound engineering practice under Cat 3.3

ATEX Directive 94/9/EC:

 II 2GD Ex d IIC T6 (-40°C to +45°C)
Ex tb IIIC T85°C

Certificate No. SIRA14ATEX1059X
IEC 60079-0, EN 60079-1, EN 60079-31

 II 1G Ex ia IIC T6 (-40°C to +60°C)

Certificate No. SIRA14ATEX1059X
IEC 60079-0, EN 60079-11, EN 60079-14

GLOBAL CERTIFICATION



IECEX Certified

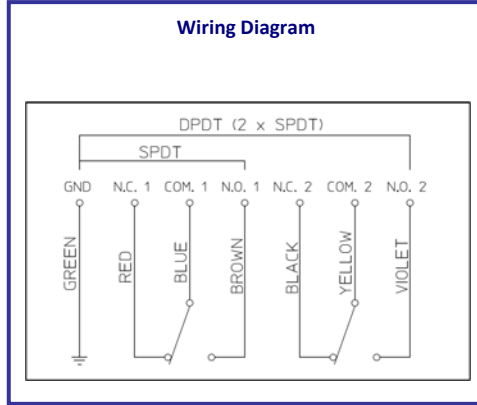
Ex d IIC T6 (-40°C to +45°C)
Ex tb IIIC T85°C

Certificate No. IECEXSIR.0034X
IEC 60079-0, EN 60079-1, EN 60079-31

Ex ia IIC T6 (-40°C to +60°C)

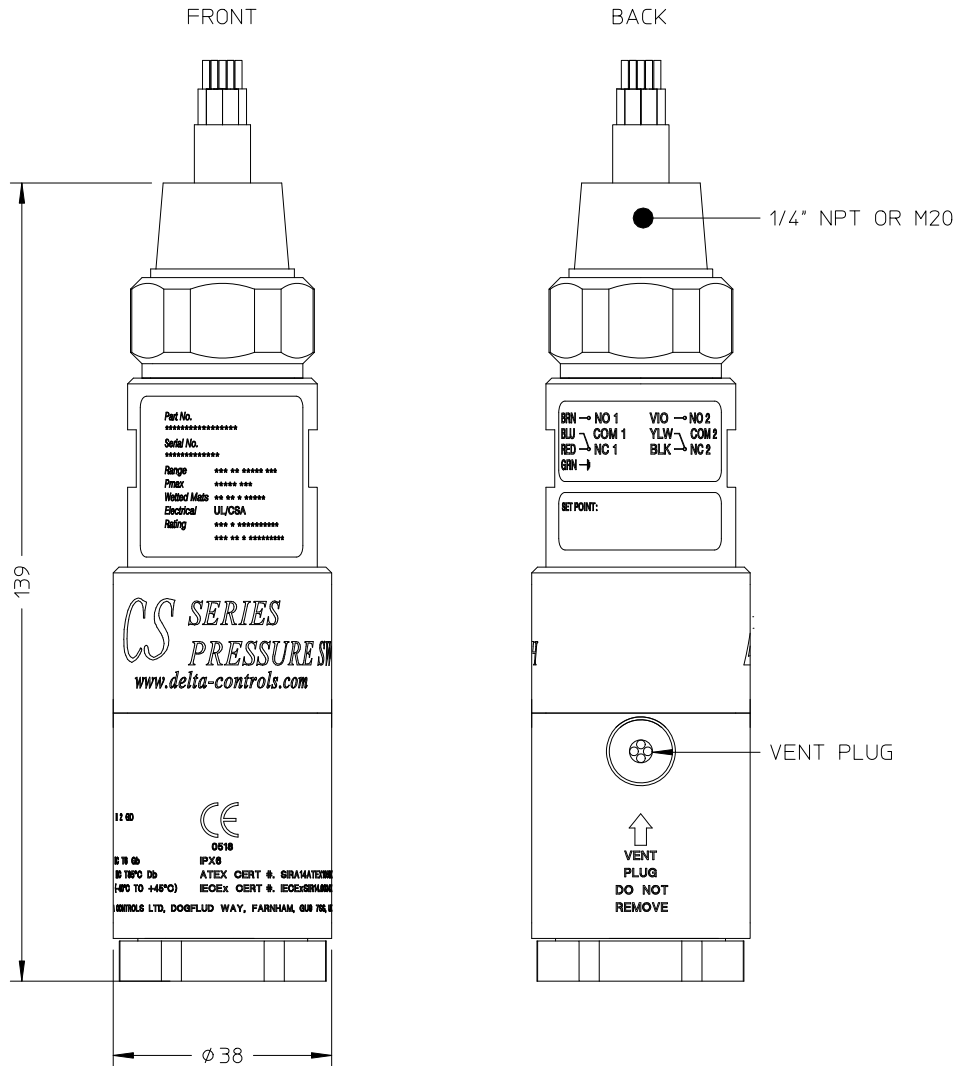
Certificate No. IECEXSIR.0034X
IEC 60079-0, EN 60079-11, EN 60079-14

Dimensions



Dimensions

All dimensions in mm (Inches)



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Delta Controls Limited
Riverside Business Park, Dogflud Way, Farnham, Surrey GU9 7SS, UK.
T+44 (0)12 5272 9140 F+44 (0)12 5272 9168 E sales@delta-controls.com W www.delta-controls.com

