

Technical Datasheet



Compact Series Pressure Switch

Models: CS2 & CS4

Key Features

- Compact and rugged design.
- Stainless steel weatherproof enclosure IP66 / NEMA 4X
- 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.
- Suitable for use in SIL 3 (1oo2) and SIL 2 (1oo1) safety related systems.

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 700 bar, the Compact Series Switches also come with either Intrinsically Safe or Flameproof approvals for use in Zone 0 or Zone 1 hazardous areas respectively.



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

How can we help you?

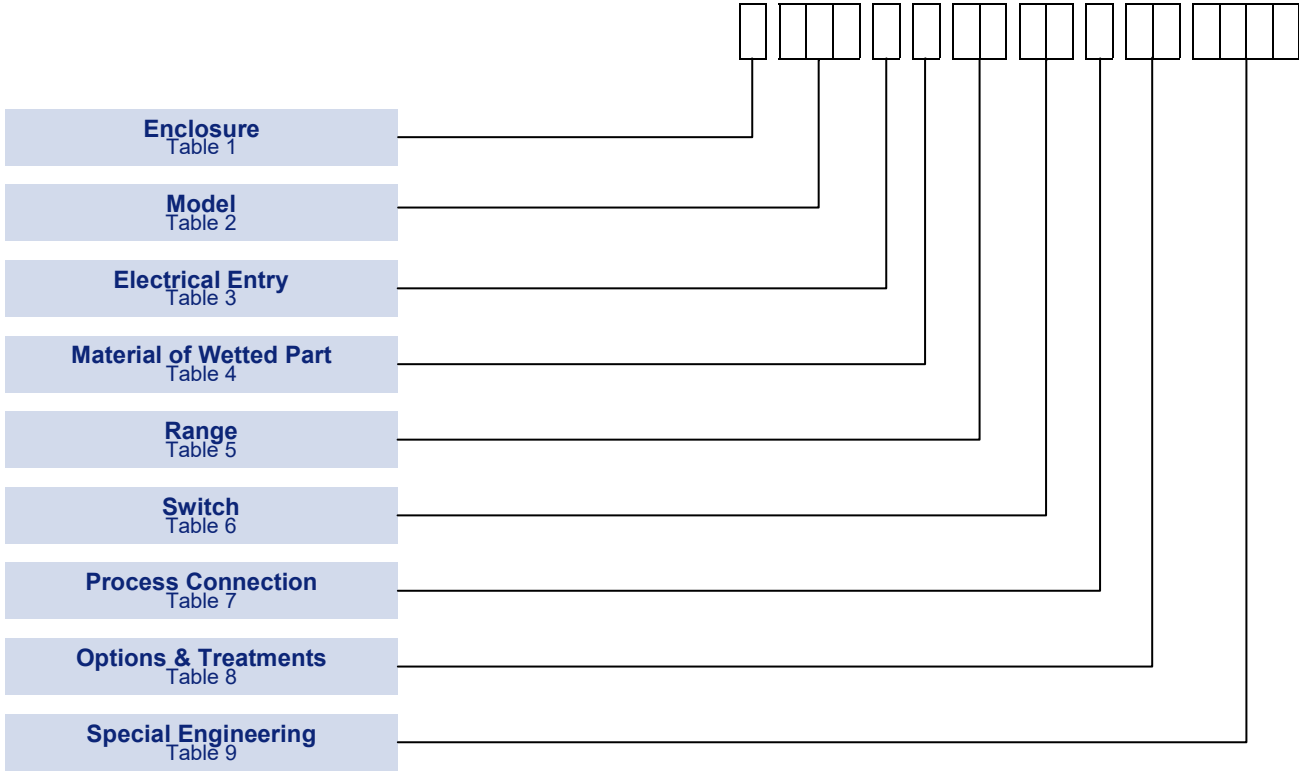
Delta Controls' offers fast, efficient and knowledgeable support when and where you need it. Please visit our web site at www.delta-controls.com to find your local support centre or call us on:

+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.

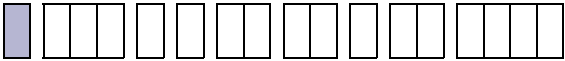
NOTE: Only the most common options are shown in this data sheet. Should you require a feature that is not shown, please contact your local sales office for further details.

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) -25°C to +60°C / -13°F to 140°F for Model CS4 (ranges U7/UK to Y4/YF)
Maximum Process Temperature:	Up to 120°C dependent on wetted parts selection (see table 4)
Enclosure classification:	IP66 / NEMA 4X
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
Approximate Weight:	0.6kg / 1.32lbs to 2kg / 4.4lb depending on model

Enclosure

TABLE 1 


	Code
Stainless Steel Weatherproof Enclosure IP66 / NEMA 4X 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 Individual Flying Leads 0.45m/18in long with 1/2– 14 NPT external conduit thread for mounting into junction boxes. RoHS and REACH compliant.	A
Factory Sealed Multicore Cable 3m/120in long multicore with 1/2– 14 NPT external conduit thread for remote mounting or mounting into junction boxes. Cable consists of silicone outer sheathing and silicone insulator for individual cores. RoHS and REACH compliant and Halogen free.	O

Compact Series
Models: CS2, CS4

Material of Wetted Parts

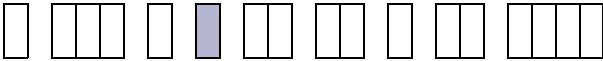
WELDED CONSTRUCTION

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.

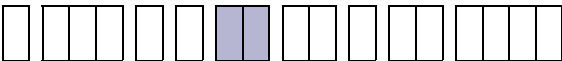
Maximum process temperature

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

TABLE 4 

	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

TABLE 5 

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	1144
	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
	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

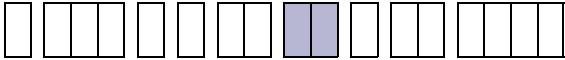
5B: PSI Units

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

Switch Options

TABLE 6 

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

CSA RATING	IEC947-5-1 / EN 60947-5-1 RATING						Contact	Code
	Designation & Utilisation Category	Rated operational current I_e (A) At rated operational voltage U_e	U_i	U_{imp}	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 DPDT DPDT	HS HD † HR ‡
	DC13 R300	0.22/0.1A @ 125/250V DC						
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 DPDT DPDT	HP HQ † HT ‡
	DC13 R300	0.22/0.1A @ 125/250V DC						
1 Amp @ 125V AC and 1 Amp @ 30V DC Gold Alloy contacts - see note	AC14 E150	0.3A @ 120VAC	125V	500V	216	36	SPDT DPDT DPDT	HV HW † HY ‡

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

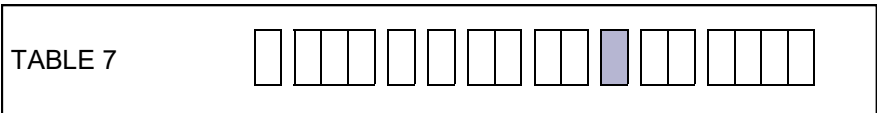
NOTE: For low energy circuits e.g. 30V and up to 100mA, we recommend using gold alloy contact switches.
NOTE: For Enclosure codes 4, HS, HD and HR switching codes are unsuitable. Use gold contact switches.
 U_i = rated insulation voltage U_{imp} = rated impulse to withstand voltage across contacts.

Compact Series
Models: CS2, CS4

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.

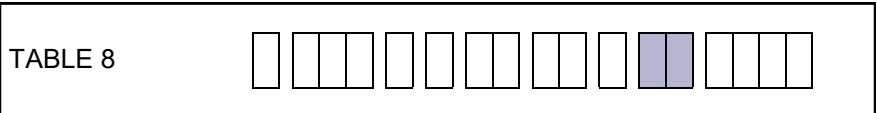


	Code
1/4—18 NPT INTERNAL	F
1/2—14 NPT INTERNAL*	H
1/2—14 NPT EXTERNAL	J

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

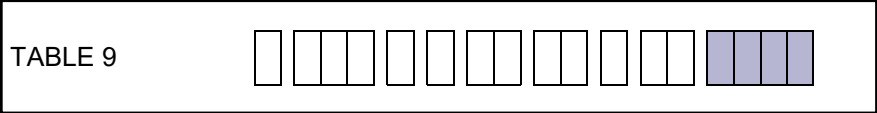
Options & Treatments

Combinations available, apply for details.



	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



	Code
Please consult Delta sales engineering for special requirements	TBA

Approvals

EUROPEAN DIRECTIVES



Low Voltage Directive (LVD) 2014/35/EU

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 (SEP) under Cat 3.3



ATEX Directive 2014/34/EU

FLAMEPROOF

Certificate No. SIRA14ATEX1059X

EN 60079-0, EN 60079-1, EN 60079-26

For Zone 1 models (**Enclosure code R, see Table 1**)



II 2GD

Ex db IIC T6 Gb

Ex tb IIIC T85°C Db

Ta = -40°C to +45°C

INTRINSICALLY SAFE

Certificate No. SIRA14ATEX1059X

EN 60079-0, EN 60079-11, IEC 60079-31

For Zone 0 models (**Enclosure code 4, see Table 1**)



II 1G

Ex ia IIC T6 Ga

Ta = -40°C to +60°C

GLOBAL CERTIFICATION



IECEx Certified

FLAMEPROOF

Certificate No. IECExSIR14.0034X

IEC 60079-0, IEC 60079-1, IEC 60079-26

Ex db IIC T6 Gb

Ex tb IIIC T85°C Db

Ta = -40°C to +45°C

INTRINSICALLY SAFE

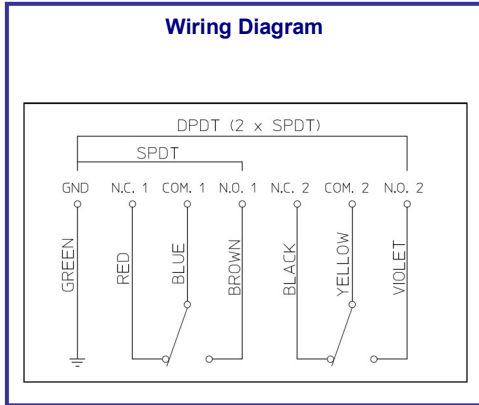
Certificate No. IECExSIR14.0034X

IEC 60079-0, IEC 60079-11, IEC 60079-31

Ex ia IIC T6 Ga

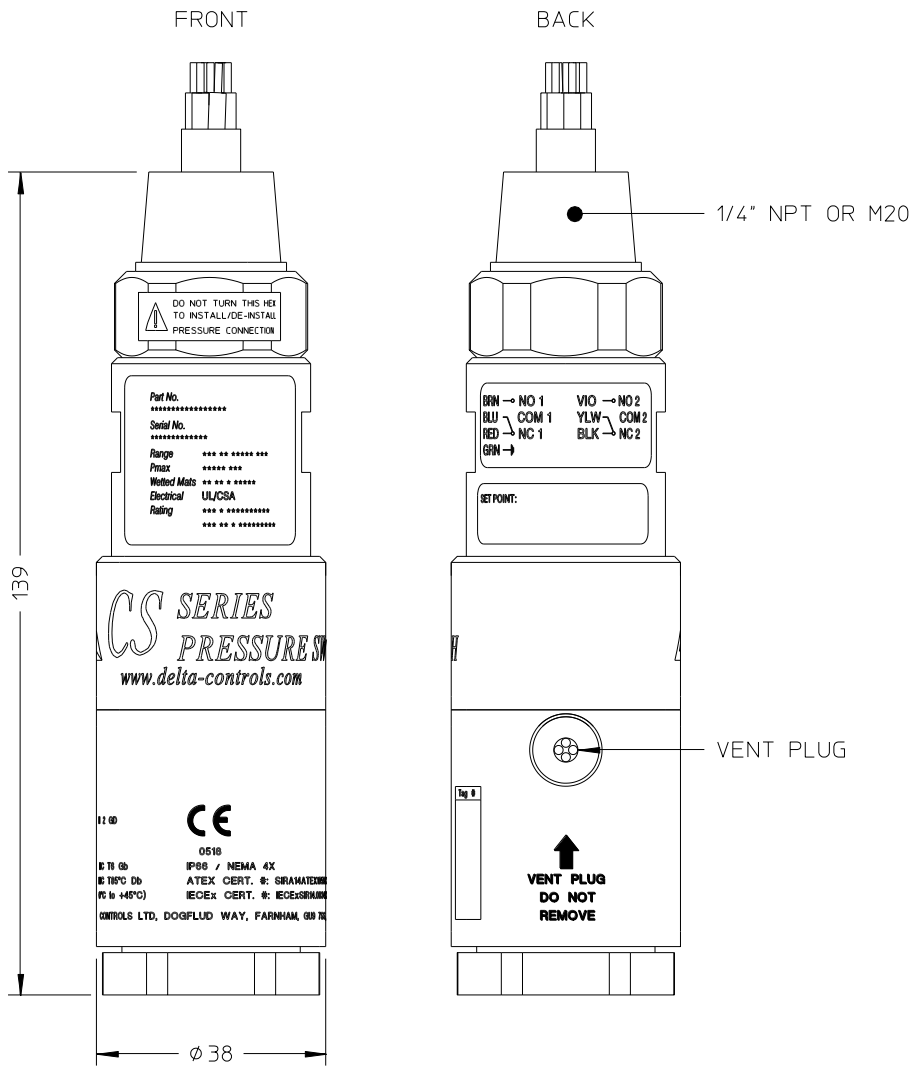
Ta = -40°C to +60°C

Dimensions



Dimensions

All dimensions in mm (Inches)



Compact Series
Models: CS2, CS4

In the interest of development and improvement Delta Controls Ltd, reserves the right to amend, without notice, details contained in this publication. No legal liability will be accepted by Delta Controls Ltd for any errors, omissions or amendments.

Delta Controls Limited
Riverside Business Park, Dogflud Way, Farnham, Surrey GU9 7SS, UK.
T+44 (0)1252 729140 F+44 (0)1252 729168 E sales@delta-controls.com W www.delta-controls.com



ISO9001

FM00720

Page 8 of 8