

Technical Datasheet



Industrial Series

Vapour Pressure Temperature Switch

Model: S71

Key Features

- Weatherproof and Flameproof models ATEX and NEC 500
- 316 stainless steel capillary and bulb.
- Ranges available up to 160 to 260°C (320 to 500°F).
Maximum working temperature up to 270°C (518°F).
- Field set point adjustment against a reference scale.
- Hermetically sealed microswitch options.
- Optional gold alloy contacts.
- Terminal block for easy field wiring.
- Safety vented design as standard



Series Overview

- The Industrial Series switches were developed in the mid -1990's to offer customers a robust range of switches suitable for applications where requirements were more standard than those for which the highly configurable Performance Series switches were designed.
- The model S71 Industrial Series temperature switches comprise an armoured capillary or rigid stem thermal system upon which a compression gland slides to enable various depths of thermowell (pocket) to be accommodated. This sensor is coupled to the microswitch via a precision stainless steel mechanism, the combination of which helps deliver the market leading performance customers can expect from the Series.

Other products in the series include:

- Pressure Switches: Model S20
- Differential Pressure Switches: Model S30



Product applications

The S71 Industrial Series is suitable for a wide range of applications in:

- Oil & Gas
- Chemical
- Petrochemical
- Refining
- Power
- OEM

The choice of models available ensures that the S71 Industrial Series is suitable for use in:

- Corrosive atmospheres
- Resistant to chemical attack

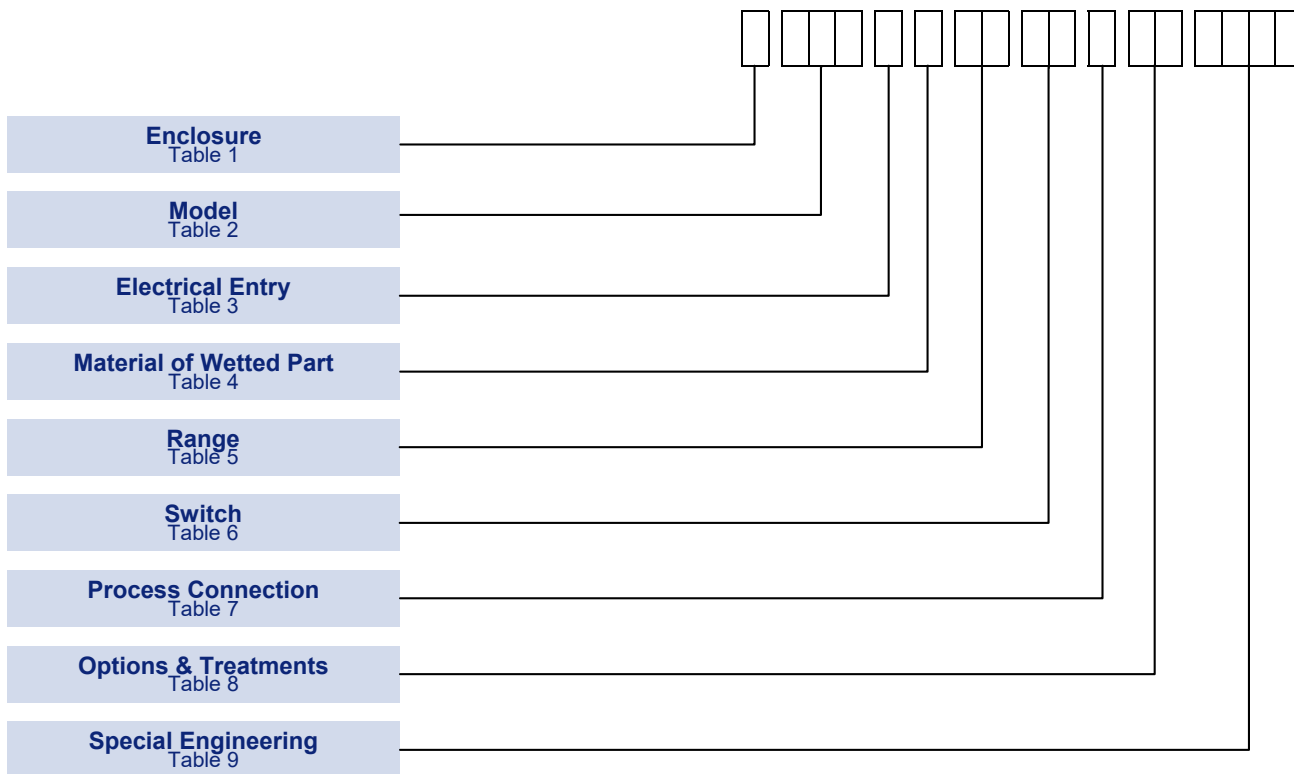
How can we help you?

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

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.

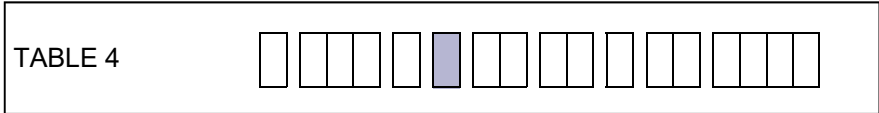
Technical Specification

Industrial Series
Models: S71


Accuracy:	Set point repeatability ± 1% of span at 20°C / 68°F ambient.
Storage Temperature:	-25 to +60°C / -13 to +140°F
Ambient Temperature:	-25 to +60°C / -13 to +140°F
Maximum Process Temperature:	Subject to appropriate installation practice, the component parts withstand up to +60°C (+140°F). For higher temperatures, refer to SPECIAL ENGINEERING.
Maximum Working Pressure:	System sensing probes for both the capillary and rigid stem version are designed to withstand 100 bar (1500 psi) without a thermowell.
Enclosure classification:	IP66 / NEMA 4X / Flameproof Ex d.
Switch output:	SPDT or DPDT snap action microswitch (standard). Hermetically sealed (optional).
Electrical rating:	See Table 6.
Process Connection:	3/8 NPT External Sliding Gland, 1/2 NPT External Direct Mounting.
Approximate Weight:	Enclosures: "H & T" 2.6kg/5.7lb; "R & U" 7.1kg/15.6lb; "W" 2.6kg/5.7lb; "A" 3.9kg/8.6lb.

System details

The flexible capillary version of Series S70 comprises an armoured capillary attached to the sensing bulb via a semi-rigid extension on which a 1/2" NPT compression gland slides to enable various depths of thermowell (pocket) to be accommodated. All exposed parts of the thermal system are in 300 series austenitic stainless steel with the capillary and sensing bulb in 316 stainless steel.



Capillary Length		Semi Rigid Stem Length		Sensing Bulb Length		Code
Metres	Feet	mm	inches	mm	inches	
1.86	6	250	10	75	2.95	N
1.86	6	500	20	75	2.95	P
Rigid Stem Probe Total Length 216mm (8.5ins)				75	2.95	R

 Applies to all details in the above table.

The rigid stem version has an integral thread for direct mounting or via a thermowell. Material of probe 316 stainless steel.

NOTE: Bulb diameter, all ranges 9.5mm or 0.37 inches.

Setting Ranges

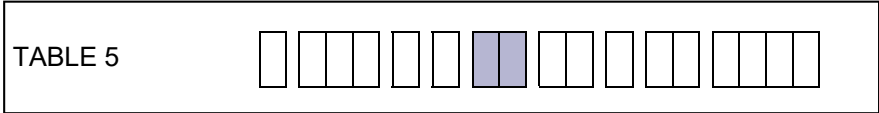


Table 5A - °C

T _{max}	RANGE	Code
70	-40 to +60	H1
110	0 to 100	K3
200	110 to 190	Q6
270	160 to 260	U5

Table 5B - °F


T _{max}	RANGE	Code
158	-40 to +140	HA
230	32 to 212	KB
392	230 to 374	QC
518	320 to 500	UA

T_{max}= maximum working temperature

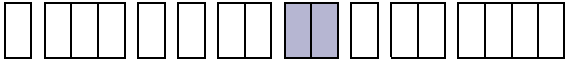
Ranges L5, Q6 and U5 (LC, QC and UA) cannot be used on rigid stem models (system code R).

Limitation due to heat conduction causing an unacceptable rise in surface temperature. See table 1.

When ordering, please state units required. Range and set point will be in units of preference.

 Applies to all details in the above table.

Switch Options


TABLE 6 

Model S71									
CSA RATING (RESISTIVE) see note	IEC947-5-1 / 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 D300 DC13 R300	0.6/0.3A @ 120/240 V 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 D300 DC13 R300	0.6/0.3A @ 120/240 V 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 § 100mA @ 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 & 5 Amps @ 30V DC Environmentally sealed	AC14 D300 DC13 R300	0.6/0.3A @ 120/240 V 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 @ 120 V AC	125V	0.5kV	AC	216	36	SPDT DPDT	0G 0H
5 Amps @ 250V AC & 2 Amps @ 30V DC Hermetically sealed. Gold plated silver contacts	AC14 D300 DC13 R300	0.6/0.3A @ 120/240 V AC 0.22/0.1A @ 125/250V DC	250V	0.5kV	AC DC	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

NOTE: Enclosure Codes T and U. Microswitch Codes 02 and 03. CSA rating as follows:-
110/250V AC 5A 250V/125V DC 0.25/0.5A

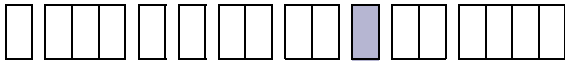
Enclosure Codes H and R. Microswitch Codes 02 and 03. CSA rating as follows:-
110/250V AC 5A 250V/125/30V DC 0.25/0.5/2A


 00, 01, 02, 03, 04, 05, H2, H3†, H6‡ microswitches
CSA accepted component for use in hazardous areas Class 1, Div 2, Groups A, B, C and D.
When used in enclosures T and U.

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 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 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 to withstand voltage across contacts.

Process Connection

TABLE 7 

 Applies to all connection in this table

	Code
3/8 NPT EXT Sliding Gland	E
1/2—14 NPT EXT Direct Mounting	J

Industrial Series
Models: S71

Options & Treatments

Combinations available, apply for details.


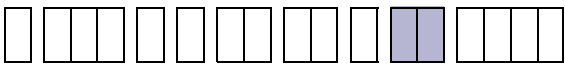
 Applies to all options and treatments in this table.

TABLE 8 

	Code
Tropicalisation High humidity atmospheres	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 utilized for mounting the instrument	10
Category IV Safety Accessory as defined in the Pressure Equipment Directive 97/23/EC	60
Tagging - Variety of tagging methods are available	APPLY FOR DETAILS
Applies when - no option is required and selection is made from special engineering	00
PVC covered armoured capillary	40

Special Engineering

Last 4 digits of model code only used when special engineering is required.


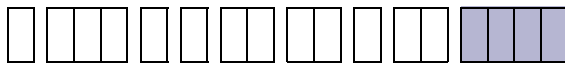
 Refer to engineering

TABLE 9 

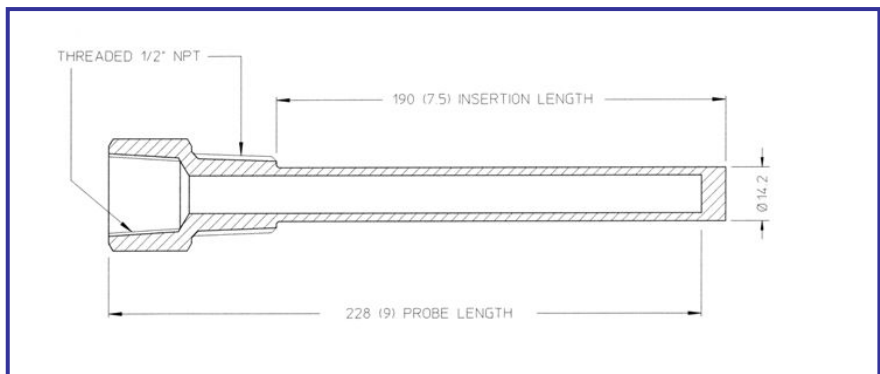
	Code
Please consult Delta sales engineering for special requirements	TBA

THERMOWELLS

Material 316SS.
Maximum working pressure 140bar (2000psi) at 20°C.

Thermowells can also be manufactured to customer own drawings/specification requirements.

All dimensions in mm (inches)



Performance Data

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

Flameproof models maybe 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.

TABLE 10

CELCIUS UNITS												
Range		T _{max} °C	Microswitch - Option Switching Differential °C									
Code	°C		00	01	02	03	04	05	08/0G	06/0H	H2	H3/H6
H1	-40 to +60	70										
K3	0 to 100	110										
L5	50 to 170	180	1.5	2.5	2	4	1.5	3	6	6	8	10
Q6	110 to 190	200										
U5	160 to 260	270										

FARENHEIT UNITS												
Range		T _{max} °C	Microswitch - Option Switching Differential °F									
Code	°C		00	01	02	03	04	05	08/0G	06/0H	H2	H3/H6
HA	-40 to +140	158										
KB	32 to 212	230										
LC	120 to 340	360	2.7	4.5	3.6	7.2	2.7	5.4	10.8	10.8	14.4	18
QC	230 to 374	392										
UA	320 to 500	518										

Electrical Connection

<p>Terminal Block Cable entry is to a non-pinching terminal block made of a non-hygroscopic thermosetting plastic, suitable for cables up to 2.5mm²/14AWG.</p>
<p>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.</p>
<p>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, H4 and H6. Refer to Table 6.</p>
<p>Electrical Entry Standard options are listed in Table 3. Other threads can be accommodated by adaptors. Dual entry available, see Table 3.</p>

Optional Extras

<p>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.</p>
<p>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.</p>
<p>Electrical Isolation These products are not suitable for electrical isolation. Always isolate circuit separately to carry out any electrical work.</p>

Industrial Series
Models: S71

Approvals

EUROPEAN DIRECTIVES



Low voltage Directive (LVD) 2014/35/EU.
Compliant to LVD

ATEX Directive 2014/34/EU:



FLAMEPROOF:
Certificate No. BAS01ATEX2113X
EN 60079-0, EN 60079-1, EN 60079-31, EN 60079-26

For Zone 1 models (**Enclosure code H/R, see table 1**)

Fluorosilicone O-ring

- II 2 GD Ex d IIC T6 Gb (Tamb -60°C to +65°C)
Ex tb IIIC T85°C Db
- II 2 GD Ex d IIC T5 Gb (Tamb -60°C to +80°C)
Ex tb IIIC T100°C Db

Nitrile O-ring

- II 2 GD Ex d IIC T6 Gb (Tamb -30°C to +65°C)
Ex tb IIIC T85°C Db
- II 2 GD Ex d IIC T5 Gb (Tamb -30°C to +80°C)
Ex tb IIIC T100°C Db

GLOBAL CERTIFICATION



CANADIAN STANDARDS ASSOCIATION
Enclosure codes T & U.
Class 1, Groups C & D Class II, Groups E, F, G.
LR94185-2

SAFETY INTEGRITY LEVEL (SIL)

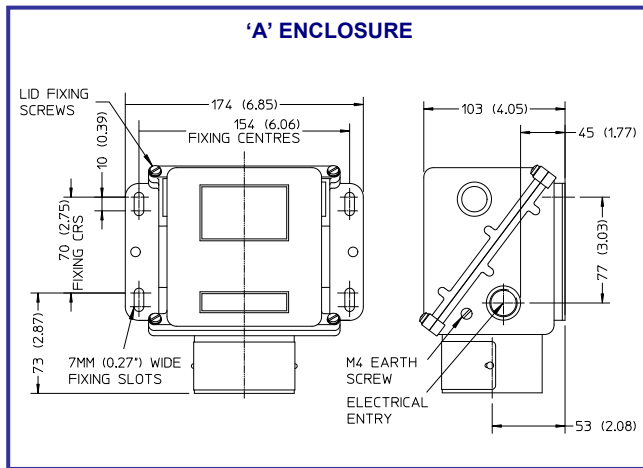
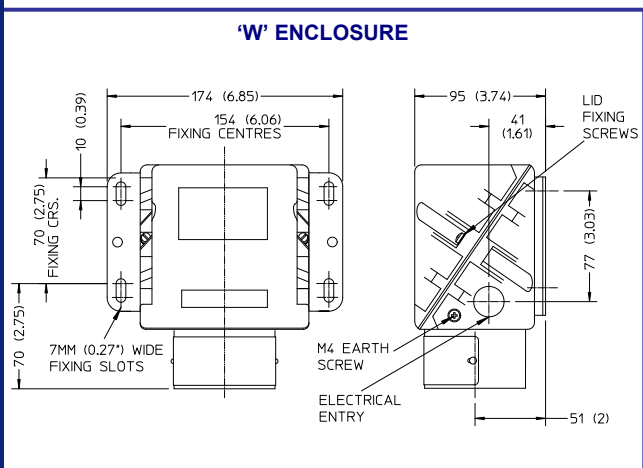
IEC 61508 Part 1 and 2
Systematic integrity and random integrity SIL2 Capable
Certificate number DC060816C001

Industrial Series

Models: S71

Dimensions

All dimensions mm (inches)



Dimensions

