

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

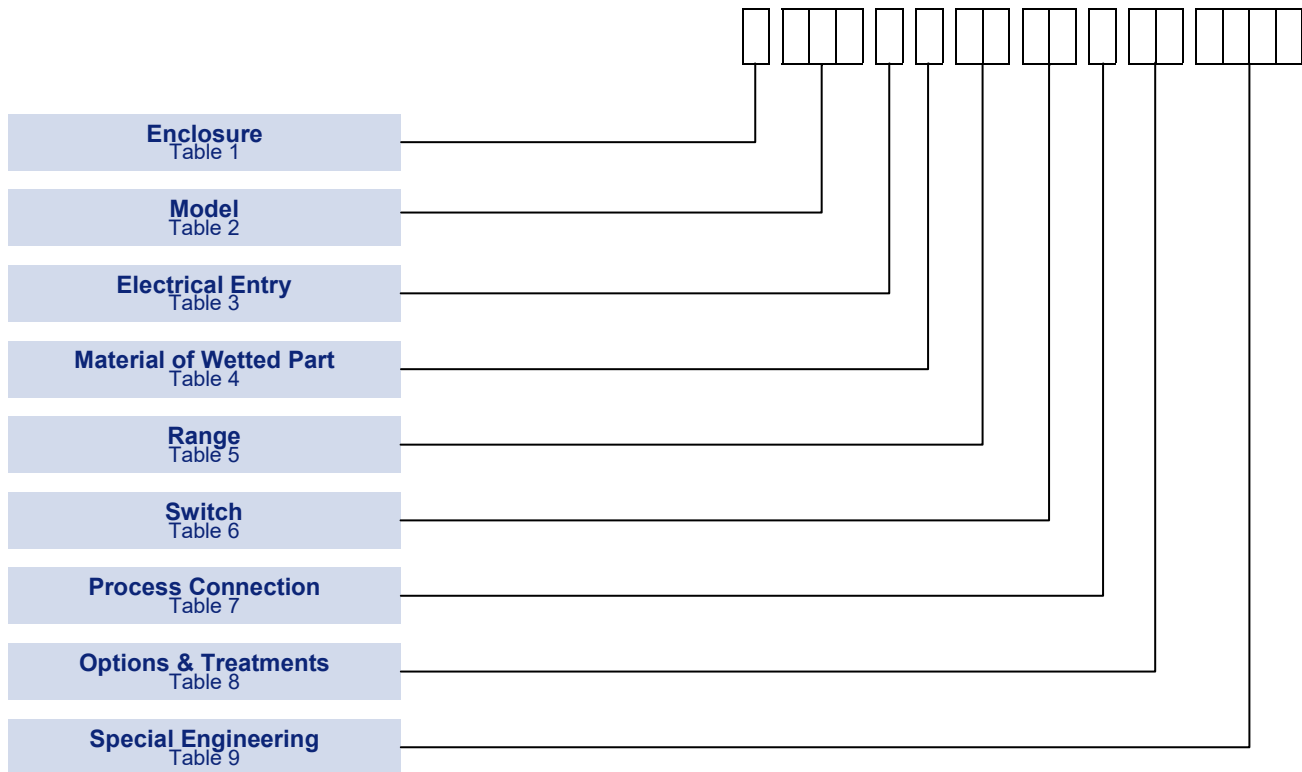
How can we **help you?**

We offer fast, efficient and knowledgeable support when and where you need it. Please visit our website at www.delta-mobrey.com to find your local support centre or call us on:

1.800.668.3979

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

Accuracy:	Set point repeatability $\pm 1\%$ 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.

Enclosure

FINISH

All enclosures except Type R, A and U 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.

NOTE: Codes H, T for 4X

Aluminium Enclosure protected by quality epoxy paint system.

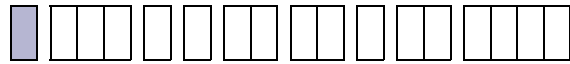
Performance of enclosure requires careful installation and sealing of cable gland connection in site.

Assembly requires to be built for Marine use, See Table 8, Code 2.

Temperature in Table 1 refer to limitations for certified enclosures.

See **TECHNICAL DATA**.

TABLE 1



ENCLOSURE TYPES	Code
FLAMEPROOF ENCLOSURES	
ATEX Ex d IIC T6 Gb (-60 to +65°C), T5 Gb (-60 to +80°C) II 2 GD (ZONE 1) Gravity die-cast enclosure in aluminium-silicon alloy, epoxy painted. Suitable for outdoor use, IP66 / NEMA 4X. See Note.  II 2 GD	H
ATEX Ex d T6 Gb (-60 to +65°C), T5 Gb (-60 to +80°C) II 2 GD (ZONE 1) For Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel. Suitable for outdoor use, IP66 / NEMA 4X.  II 2 GD	R
NEC 500, NEMA 7, 9 Gravity die-cast enclosure in aluminium-silicon alloy, epoxy painted. Class 1, Groups C and D, Class II, Groups E, F and G. Suitable for outdoor use, IP66 / NEMA 4X. 	T
NEC 500, NEMA 7, 9 For Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel. Class 1, Groups C and D, Class II, Groups E, F and G. Suitable for outdoor use, IP66 / NEMA 4X. 	U
WEATHERPROOF ENCLOSURES	
General purpose The basic enclosure is pressure die-cast in zinc alloy, epoxy painted, with weather protection not less than NEMA 4, IP66.	W
For Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel with weather protection not less than NEMA 4X, IP66	A

Models

 Applies to all materials.

TABLE 2



	Code
Fixed Switching Differential SPDT & DPDT options available. See Table 6.	S71

Electrical Entry

Adaptors are available for other popular thread sizes.

 *For codes 3 & 6 see approvals and Table 1 Codes T & U

TABLE 3



	Code
Enclosure W: Clearance for 20mm (3/4 in) outside dia conduit.	1
Enclosure W: M20 x 1.5 elbow adaptor to suit.	0
Enclosure W: 3/4-NPT INT. elbow adaptor to suit.	3
Enclosures H, R & A: M20 x 1.5 ISO thread.	0
Enclosures H, R & A: M20 x 1.5 ISO thread, dual entry.	5
Enclosures H, R & A: 1/2" NPT Internal	2
Enclosures H, R, T & U: 3/4-NPT INT (direct).	3*
Enclosures H, R, T & U: 3/4-NPT INT dual entry	6*

Industrial Series
Models: S71

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.

TABLE 4



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



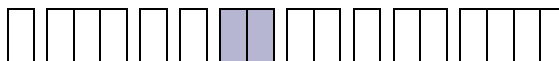
Applies to all details in the above table.

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 5



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 5A - °C

Table 5B - °F

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.

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



Applies to all details in the above table.

Process Connection



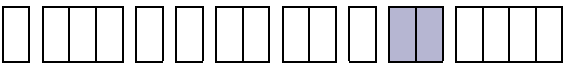
Options & Treatments

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

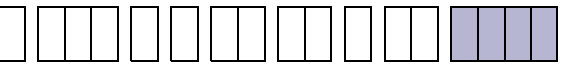
Special Engineering

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



Refer to engineering

TABLE 9



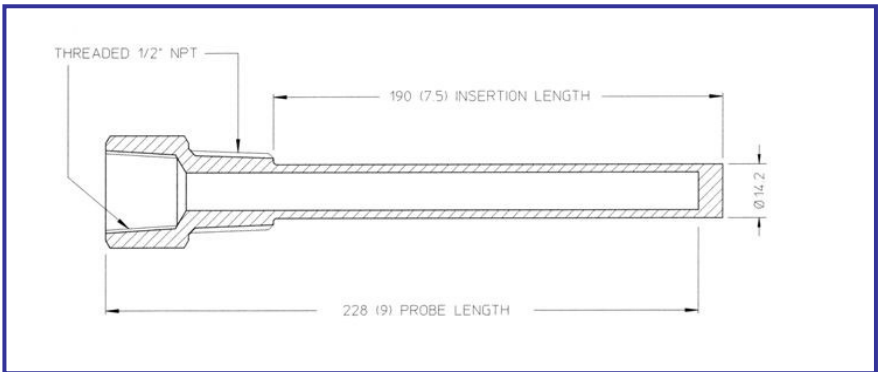
	Code
Please consult Delta sales engineering for special requirements	TBA

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.

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

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.

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, H4 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, see Table 3.

Optional Extras

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.

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

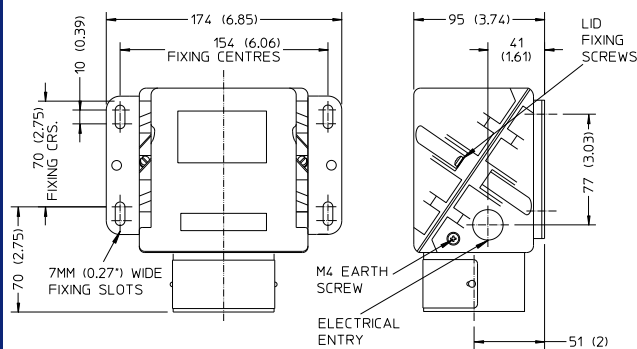
SAFETY INTEGRITY LEVEL (SIL)

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

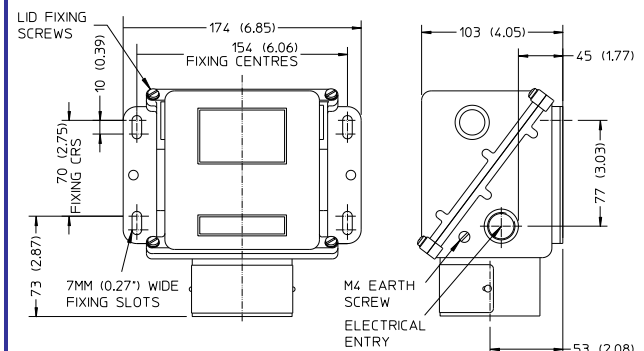
Dimensions

All dimensions mm (inches)

'W' ENCLOSURE

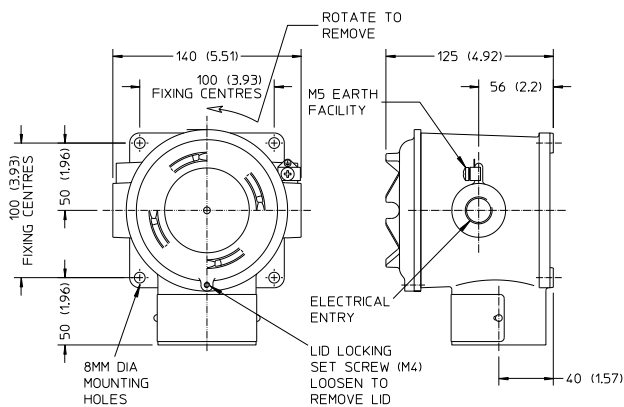


'A' ENCLOSURE



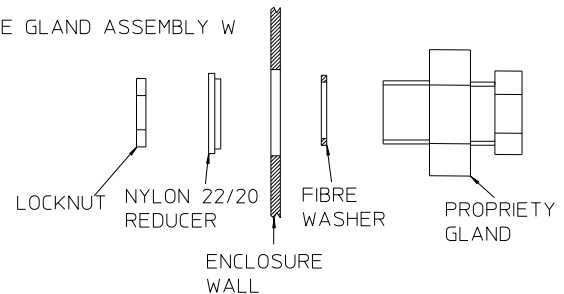
Dimensions

'H', 'R', 'T', 'U' ENCLOSURES

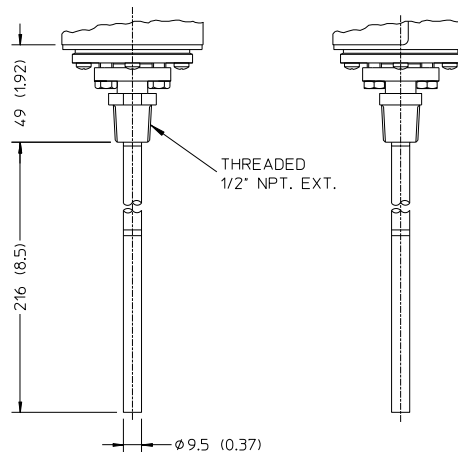


CABLE GLAND ASSEMBLY

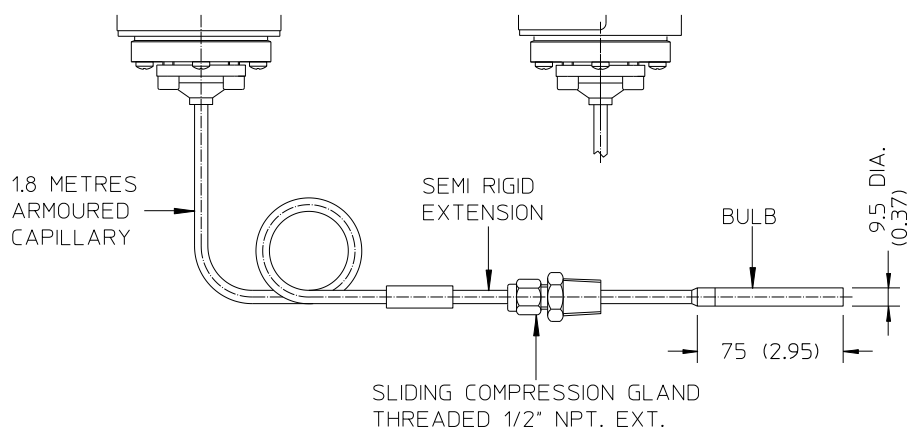
CABLE GLAND ASSEMBLY W



RIGID STEM VERSION – CODE R



CAPILLARY VERSION – CODES N & P



Industrial Series

BEP-Bestobell / Bestobell-Aquatronix
2880 Argentia Road, Unit 3
Mississauga, ON, L5N 7X8
Tel. 905-826-1953 / Fax 905-826-1778
www.bestobell.com

BEP-Bestobell / Bestobell-Aquatronix
970 Montée de Liesse, #204
St. Laurent, QC, H4T 1W7
Tél. 514-331-1225 / Fax 514-331-4255
www.bestobell.com

BEP-Bestobell / Bestobell-Aquatronix
166 North Side Road
Riverport, NS, B0J 2W0
Tel. 902-766-0220 / Fax 514-331-4255
www.bestobell.com

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