

Technical Datasheet



Sentry Series - Temperature Switch

Models: T01 & T02

Key Features

- SPDT & DPDT Switch Outputs
- Stainless Steel Aluminium Epoxy Coated Weatherproof Enclosure IP66/NEMA4X
- ATEX / IECEx Flameproof & Intrinsically Safe
- 316 Stainless Steel capillary and bulb.
- Field Adjustable Set-points Against a Reference Scale
- Temperature Ranges up to 350°C (660°F)
- Maximum Working Temperature up to 360°C (680°F)
- Safety Vented Design as Standard
- **Market leading 5 year warranty**

Series Overview

The Sentry Series offers exceptional performance and high build quality in a simple, safe and cost-effective package.

- Performance is assured by repackaging Delta's well proven sensor technologies in a new, simple, one-piece enclosure.
- Safety is maintained by a vent that prevents the enclosure becoming pressurized in the event of a sensor being damaged.
- Cost is minimised through the selection of common standard options although, as with all Delta products, a variety of optional extras are available to tailor the product to specific needs.

Other products in the series include:

- Pressure Switches: Model P0
- Differential Pressure Switches: Model D0



Product applications

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

- Process plants
- OEM equipment

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

- General purpose
- Zone 0 & 20 Hazardous Areas
- Zone 1 & 21 Hazardous Areas
- SIL 2 safety related systems
- Corrosive atmospheres

How can we help you?

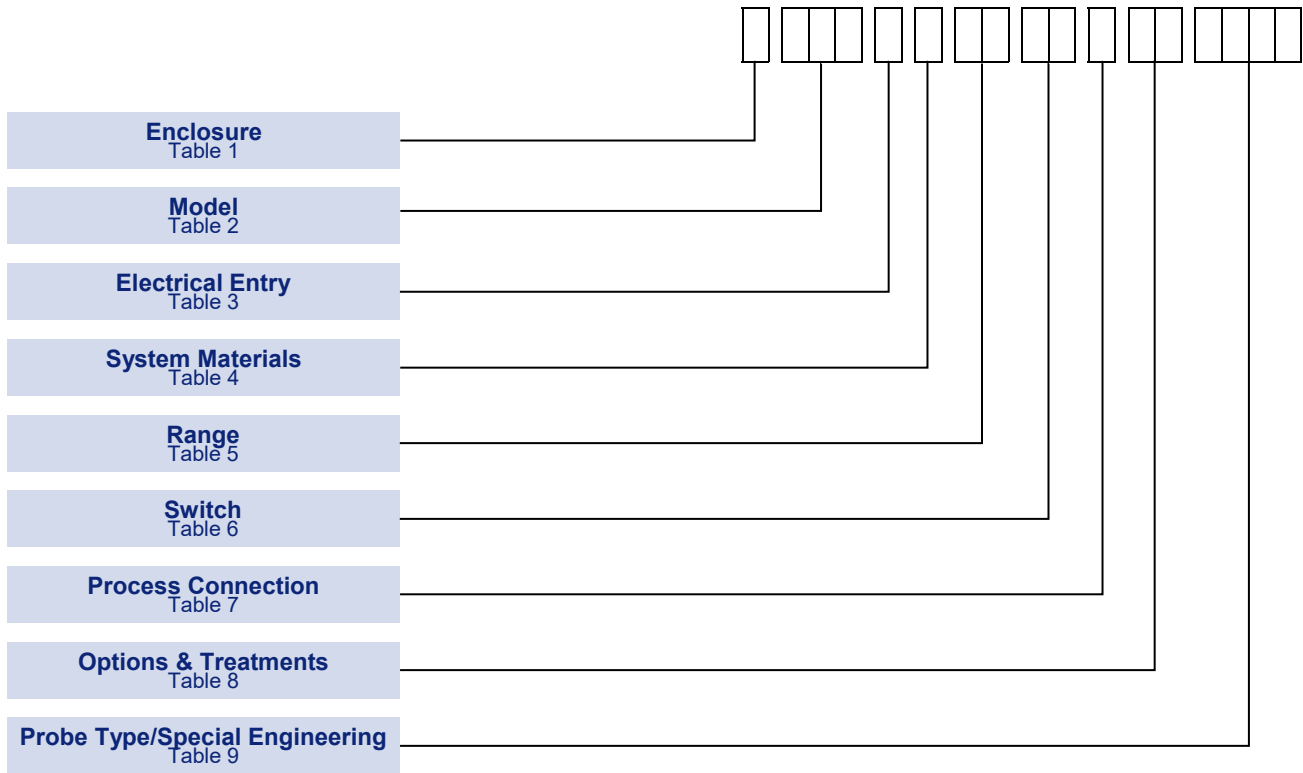
Delta Mobrey offers fast, efficient and knowledgeable support when and where you need it. Please visit our web site at www.delta-mobrey.com to find your local support centre or call us on:

+44 (0)1252 729140

Sentry Series
Models: T01 & T02

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

Sentry Series
Models: T01 & T02



Accuracy:	Set point repeatability \pm 1% of span at 20°C / 68°F
Storage Temperature:	-40 to +60°C / -40 to +140°F
Ambient Temperature:	-30 to +60°C / -22 to +140°F
Maximum Process Temperature:	See Table 5
Enclosure classification:	IP66 / NEMA 4X / Flameproof Ex d / Intrinsically Safe Ex ia
Switch output:	SPDT or DPDT snap action microswitch (standard) Hermetically sealed (optional)
Electrical rating:	See Table 6
Process Connection:	1/2" NPT M
Approximate Weight:	1.7kg / 3.7lbs - 5.1kg / 11.2lbs depending on model

Enclosure

All enclosures die-cast in aluminium, epoxy painted, with weather protection not less than NEMA types 4X / IP66

INTRINSIC SAFETY

Because of low voltages and current of I.S. circuit, we recommend using gold and/or sealed contacts

WEATHERPROOF ENCLOSURE		Code
General Purpose The basic enclosure is die-cast in aluminium, epoxy painted, with weather protection not less than NEMA type 4X, IP66.		W
Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel with weather protection not less than NEMA4X, IP66		A
Intrinsic Safety: Ex ia As per General Purpose enclosure above but ATEX and IECEx approved for use in Zone 0 hazardous locations.  II 1GD Ex ia IIC T5 / T6 Ga Ex ia IIIC T100°C / T85°C Da		5
Intrinsic safety: Ex ia For Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel with weather protection not less than NEMA4X, IP66		4
Flameproof: Ex d ATEX / IECEx approved for use in a Zone 1 & Zone 21 hazardous locations  II 2GD Ex d IIC T6(Tamb-30°C to +65°C) Gb Ex tb IIIC T85°C (Tamb-30°C to +65°C) Db IP6X		H
Flameproof For Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel with weather protection not less than NEMA4X, IP66 ATEX/ IECEx approved for use in a zone 1 & zone 21 hazardous locations		R

Models

T01

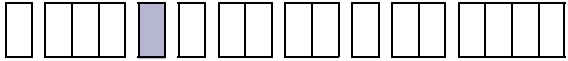
For applications up to 100°C (212° F), maximum working temperature 110°C (230°F).

T02

For applications up to 350°C (660° F), maximum working Temperature 360°C (680°F).

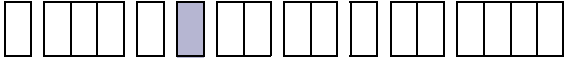
Temperature		Code
Temperature	Rigid Stem Vapour Pressure	T01
Temperature	Flexible thermal system Vapour Pressure	T02

Electrical Entry

TABLE 3 

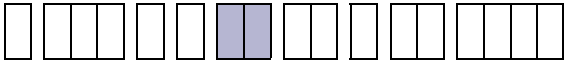
	Code (Singles entry)	Code (Dual Entry)
M20 x 1.5 Internal ISO Thread	0	5
½ NPT Internal Thread	2	4

System Materials

TABLE 4 

	Code
316 Stainless steel	2

Setting Ranges

TABLE 5 

*Deadband figures are typical for Code 10 SPDT 15A microswitches (see Table 6) with falling set-points at mid-scale.

Deadbands for other microswitch options are shown in Table 10.

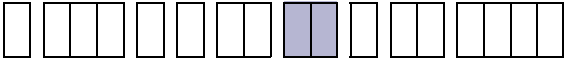
Due to manufacturing tolerances the figures quoted are for guidance only.

Should the differential be critical for specific applications, our engineers should be consulted before ordering.

Availability		Range	Tmax	Deadband*	Code
T01	T02	°C	°C	°C	
✓	✓	-40 to +60	70	4	H1
✓	✓	10 to 100	110	4	K4
✗	✓	50 to 120	130	4	L4
✗	✓	120 to 220	230	4	S4
✗	✓	150 to 270	280	5	TH
✗	✓	230 to 350	360	6	V9

Availability		Range	Tmax	Deadband*	Code
T01	T02	°F	°F	°F	
✓	✓	-40 to +140	158	7	HA
✓	✓	50 to 212	230	7	KC
✗	✓	120 to 250	270	7	LB
✗	✓	250 to 430	450	7	SE
✗	✓	300 to 518	540	9	TQ
✗	✓	450 to 660	680	11	V0


Switch Options

TABLE 6 

CSA Rating (RESISTIVE) §SEE NOTE	IEC 947-5-1/EN 60947-5-1 RATING							Contact	Code
	Designation & Utilization Category	Rated operational current le (A) at rated operational voltage Ue	U _i	U _{imp}	VA Rating				
						Make	Break		
5 A @ 110/250V AC Light Duty for AC only	AC14 D300	0.6/0.3A @ 120/240V AC	250V	0.8kV	AC	432	72	SPDT	00
	DC13 R300	0.22/0.1A @ 125/250V DC			DC	28	28	DPDT	01
1 A @ 125V AC & §100 mA @ 30V DC gold alloy contacts for low voltage switching	1 A @ 125 VAC RESISTIVE (IEC 1058-1/EN 61058-1)							SPDT	04
								DPDT	05
15 Amp @ 125/250/480 V AC & 2 A @ 30V DC General purpose precision	AC14 D300	0.6/0.3A @ 120/240V AC	250V	0.8kV	AC	432	72	SPDT	10
	DC13 R300	0.22/0.1A @ 125/250V DC	250V	0.8kV	DC	28	28	DPDT	11
5 A @ 250V AC and 2 A @ 30V DC Hermetically sealed. Gold plated silver contacts.	AC14 D300	0.6/0.3A @ 120/240V AC	250V	0.5kV	AC	432	72	SPDT	H2 [^]
	DC13 R300	0.22/0.1A @ 125/250V DC			DC	28	28	DPDT	H3 ^{†^} H6 ^{‡^}


† 2 Single pole, double throw, simultaneous falling under pressure
 ‡ 2 Single pole, double throw, simultaneous rising under pressure
 ^Terminal Block supplied as standard
 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.
 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.

Process Connection

TABLE 7 

	Code
½ - 14 NPT EXT: Sliding Gland	J

Options & Treatments

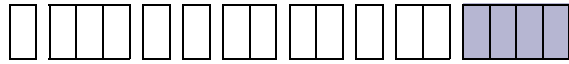
TABLE 8 

Stainless steel nameplate is available as an option

	Code
Stainless steel permanently fixed tags	20
Stainless steel wired on tag	30
Applies when – no option is required and selection is made from special engineering (see Table 9)	00

Probe Type and/or Special Engineering

TABLE 9



If a different probe length or any other non-standard options are required, the last 4 digits will consist of a special engineering code issued by Delta.

Probe Type	Capillary Length	Sensing Bulb Length	Bulb diameter	Code
Rigid Stem	n/a	81mm / 3.2"	9.5mm / 3/8"	R216
Flexible	2m / 6.5'	81mm / 3.2"	9.5mm / 3/8"	S020
Please consult Delta sales engineering for special requirements				TBA

The rigid stem version (code R216) has a sliding gland process connection for mounting via a thermowell. Material of probe is 316 stainless steel.

The flexible capillary version (code S020) comprises an armoured capillary attached to the sensing bulb. A sliding compression gland process connection is fitted to the capillary to enable various depths of thermowell to be accommodated. All parts of the thermal system are in 300 series stainless steel with the capillary and sensing bulb in 316 stainless steel.

Performance Data

TABLE 10

°C Units

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.

Range		T _{max}	Microswitch - Option Switching Differential °C							
Code	°C		00	01	10	11	04	05	H2	H3/H6
H1	-40 to +60	70								
K4	10 to 100	110								
L4	50 to 120	130	1.5	2.5	See Table 5	4	1.5	3	8	10
S4	120 to 220	230								
TH	150 to 270	280								
V9	230 to 350	360								

°F Units

Range		T _{max}	Microswitch - Option Switching Differential °F							
Code	°F		00	01	10	11	04	05	H2	H3/H6
HA	-40 to +140	158								
KC	50 to 212	230								
LB	120 to 250	270	2.7	4.5	See Table 5	7.2	2.7	5.4	14.4	18
SE	250 to 430	450								
TQ	300 to 518	540								
V0	450 to 660	680								

Approvals

EUROPEAN DIRECTIVES



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

Compliant to LVD



ATEX Directive 2014/34/EU

INTRINSICALLY SAFE

Certificate No. IECEx BAS 11.0104

IEC 60079-0, IEC 60079-11, IEC 61241-11

For Zone 0 & 20 models (**Enclosure 4 or 5, see Table 1**)

FLAMEPROOF

Certificate No. Baseefa12ATEX0121

IEC 60079-0, EN 60079-1, EN 60079-31

For Zone 1 & 21 models (**Enclosure R or H, see Table 1**)



II 1GD Ex ia IIC T5 / T6 Ga
Ex ia IIIC T100°C / T85°C Da
(-60°C ≤ Ta ≤ +80°C) / (-25°C ≤ Ta ≤ +60°C)



II 2GD Ex d IIC T6 (Tamb-30°C to +65°C) Gb
Ex tb IIIC T85°C (Tamb-30°C to +65°C) Db IP6X

GLOBAL CERTIFICATION



IECEx Certified

Ex ia IIC T5 / T6 Ga

Ex ia IIIC T100°C / T85°C Da

(-60°C ≤ Ta ≤ +80°C) / (-25°

C ≤ Ta ≤ +60°C)

FLAMEPROOF

Certificate No. IECEx BAS 12.0081

IEC 60079-0, IEC 60079-1, IEC 60079-31

Ex d IIC T6 (Tamb-30°C to +65°C) Gb

Ex tb IIIC T85°C (Tamb-30°C to +65°C) Db IP6X

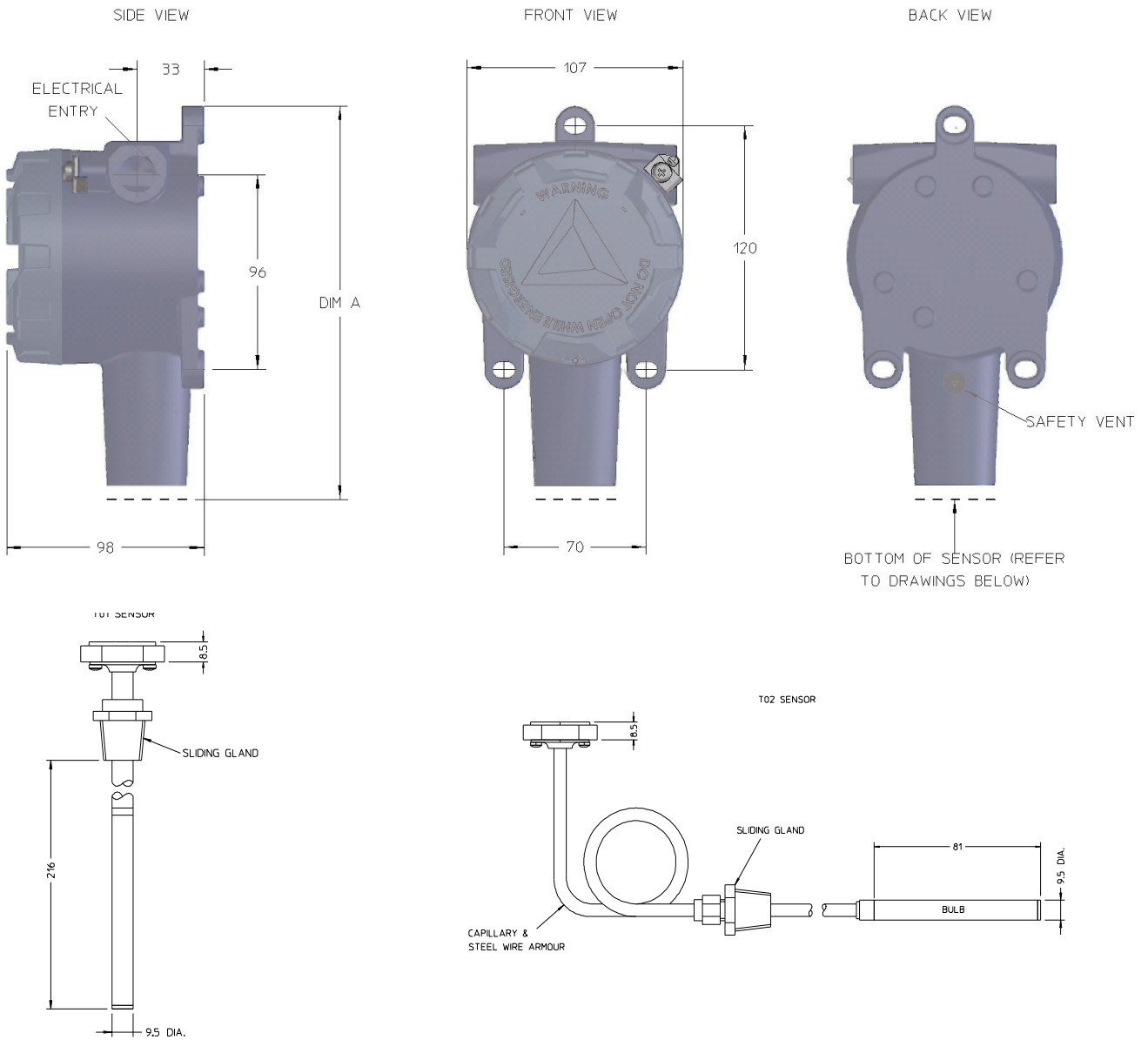


Functional Safety Certified

Meets the requirements of IEC 61508-2 for use in SIL 2 safety related systems

Certificate No. Sira FSP 12015/05

Dimensions



Model	Probe Code	DIM A
T01	R216	TBD
T02	S020	TBD

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



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