

Technical Datasheet



Sentry Series Vapour Pressure Temperature Switch Models: T01 & T02

Key Features

- SPDT & DPDT switch outputs
- Aluminium Epoxy Coated or AISI 300 SS enclosure IP66/NEMA4X
- Weatherproof, flameproof & intrinsically safe execution
- 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
- Suitable for use SIL 2 safety related systems
- Market leading 5 year warranty



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

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 Mobrey's well proven sensor technologies in a new, simple, one-piece enclosure
- Safety is maintained by a vent that prevents the enclosure becoming pressurised in the event of a sensor being damaged
- Cost is minimised through the selection of common standard options although, as with all Delta Mobrey 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



How can we help you?

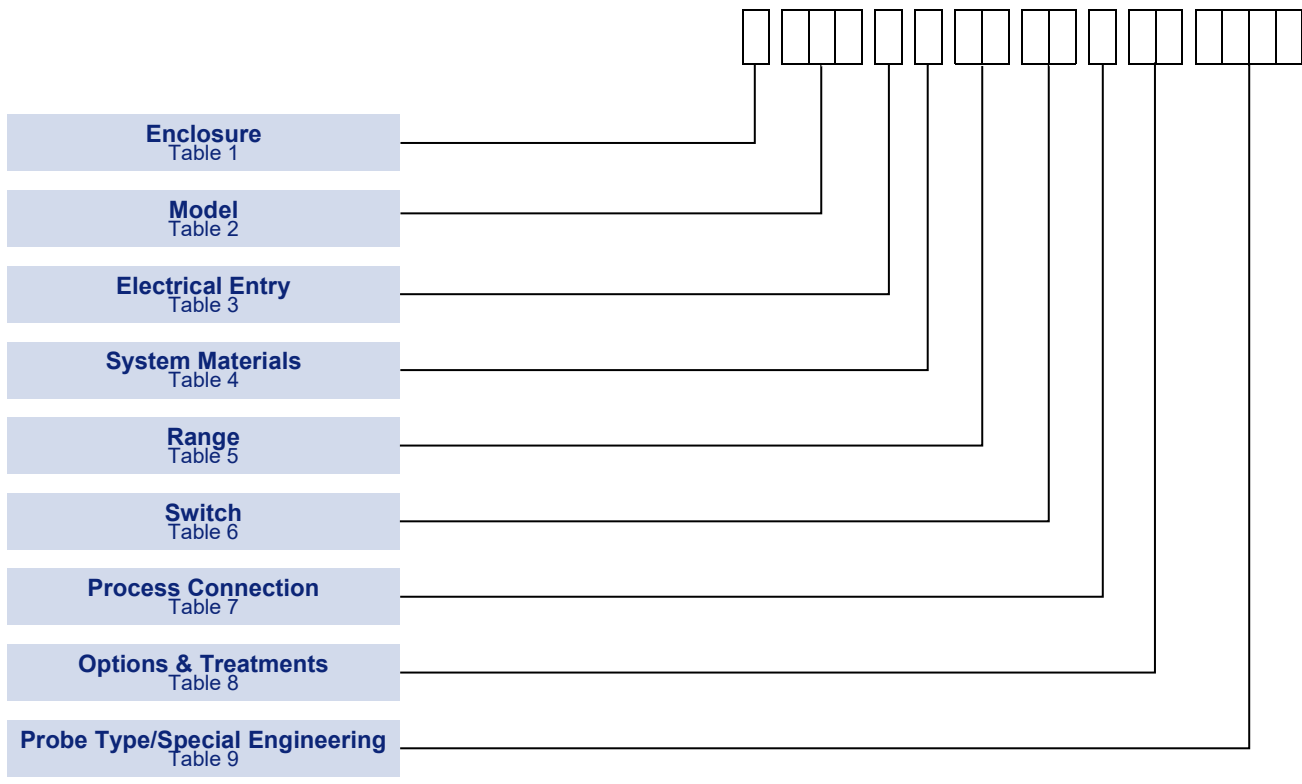
Delta Mobrey offers fast, efficient and knowledgeable support when and where you need it. Please visit our website at www.delta-mobrey.com to find your local support centre or call us on:

+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.



Technical Specification

Set point repeatability:	1% of span
Storage Temperature:	-40 to +80°C (-40 to +176°F) (for range H1/HR -40 to +70°C / -40 to 158°F)
Ambient Temperature:	-30 to +80°C (-22 to +176°F); SPECIAL ENGINEERING -60 to +80°C (-76 to 176 °F) for range H1/HR -30 to +70°C / -22 to 158°F); SPECIAL ENGINEERING -60 to +70° C (-76 to 156 °F)
Maximum Process Temperature:	See Table 5
Enclosure classification:	Weatherproof / Flameproof / Intrinsically Safe
Ingress protection:	IP 66 / NEMA 4X
Pollution degree:	pollution degree 3 according EN60947-5-1 (For extreme conditions where condensation may readily form, then sealed contacts should be used)
Switch output:	1 x SPDT or 1 x DPDT (2 SPDT Synchronized with 2% of range) snap action micro-switch (standard)
Electrical rating:	See Table 6
Terminal Block:	suitable for wire section up to 2,5 mm ² / 14 AWG
Grounding connection:	one internal and one external suitable for wire section up to 4 mm ² / 12 AWG
Electrical Safety Class:	safety electrical class 1 according IEC 61298-2:2008
Process Connection:	1/2" NPT M ; Others (optional)
Approximate Weight:	1.7kg / 3.7lbs - 5.1kg / 11.2lbs depending on model

Sentry Series
Models: T01 & T02

Enclosure

⁽¹⁾ Triple marking IECEx, ATEX and UKEx on the same product nameplate; EAC Ex on request

⁽²⁾ Safety Parameters
 Ui: 30 V; Ii: 100 mA; Pi: 0.6 W; Ci: 0; Li: 0.

ENCLOSURE TYPES:		Code
<u>WEATHERPROOF ENCLOSURE</u>		
General Purpose Die-cast in aluminium, epoxy painted, with ingress protection IP66, NEMA type 4X	W	
Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel, with ingress protection IP66, NEMA type 4X	A	
<u>FLAMEPROOF ENCLOSURE</u> ⁽¹⁾ Approved for use in a Zone 1 & Zone 21 hazardous locations Ex db IIC T5/T6 Gb, Ex tb IIIC T100/T85°C Db IP66 The temperature class is related to the ambient temperature range. See Approvals for more information		
General Purpose Die-cast in aluminium, epoxy painted, with ingress protection IP66, NEMA type 4X	H	
Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel with ingress protection IP66, NEMA type 4X	R	
<u>INTRINSIC SAFETY</u> ⁽¹⁾⁽²⁾ Approved for use in a Zone 0 & Zone 20 hazardous locations Ex ia IIC T5/T6 Ga, Ex ia IIIC T100/T85°C Db IP66 The temperature class is related to the ambient temperature range. See Approvals for more information		
General Purpose Die-cast in aluminium, epoxy painted, with ingress protection IP66, NEMA type 4X	5	
Aggressive Atmospheres Investment cast enclosure in austenitic stainless steel, with ingress protection IP66, NEMA type 4X	4	

Models

T01
 For applications up to 100°C (212°F), maximum working temperature 110°C (230°F).

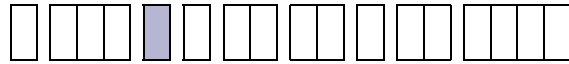
T02
 For applications up to 350°C (660°F), maximum working Temperature 360°C (680°F).

		Code
Temperature	Rigid Stem	T01
Temperature	Flexible thermal system	T02

For the standard dimensions of the probe see last page "DIMENSIONS"

Electrical Entry

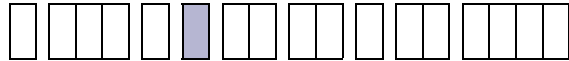
TABLE 3



	Code (Singles entry)	Code (Dual Entry)
M20 x 1.5-F	0	5
½ - 14 NPT-F	2	4

System Materials

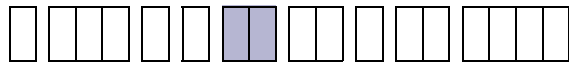
TABLE 4



	Code
316 Stainless steel	2

Setting Ranges

TABLE 5



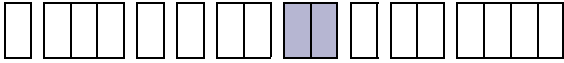
SAMA(^) Class	Availability		Range	Tmax	Code
	T01	T02	°C	°C	
II C (*)	✓	✓	-40 to +60	70	H1
	✓	✓	10 to 100	110	K4
	✗	✓	50 to 120	130	L4
II A	✗	✓	120 to 220	230	S4
	✗	✓	150 to 270	280	TH
	✗	✓	230 to 350	360	V9

SAMA(^) Class	Availability		Range	Tmax	Code
	T01	T02	°F	°F	
II C (*)	✓	✓	-40 to +140	158	HA
	✓	✓	50 to 212	230	KC
	✗	✓	120 to 250	270	LB
II A	✗	✓	250 to 430	450	SE
	✗	✓	300 to 518	540	TQ
	✗	✓	450 to 660	680	V0

(^) SAMA (Scientific Apparatus Makers Association), today LPA (Laboratory Products Association)

(*) For instruments SAMA IIC class with set point around ambient temperature, due to liquid/ vapour phase becomes less well defined, the dead band may increase.

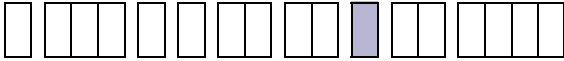
Switch Options

TABLE 6 

CSA Rating (RESISTIVE) §SEE NOTE	IEC 947-5-1/EN 60947-5-1 RATING							Contact	Code
	Designation & Utilization	Rated operational current Ie (A) at rated operational voltage Ue	Ui	Uimp	VA Rating				
					Make	Break			
5 A, 110/250V AC Light Duty for AC only	AC14 D300	0.6/0.3A, 120/240V AC 0.22/0.1A, 125/250V DC	250V	0.8kV	AC	432	72	SPDT	00
	DC13 R300				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 A, 125/250/-V AC 2 A, 30V DC General purpose precision	AC14 D300	0.6/0.3A, 120/240V AC 0.22/0.1A, 125/250V DC	250V	0.8kV	AC	432	72	SPDT	10
	DC13 R300				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
Ui = rated insulation voltage; Uimp = 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**.

Process Connection

TABLE 7 

	Code
½ - 14 NPT M: Sliding Gland	J

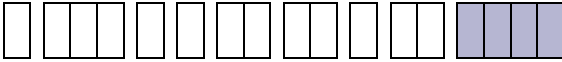
Options & Treatments

TABLE 8 

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

Sentry Series
 Models: T01 & T02

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
Std Rigid Stem	n/a	81mm / 3.2"	9.5mm / 3/8"	R216
Std. Flexible	2m / 6.5'	81mm / 3.2"	9.5mm / 3/8"	S020
Low ambient temperature version (from -60°C to +80°C)				0ACF
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

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.

°C Units

Range		T _{max} °C	Microswitch - Option Switching Differential °C							
Code	°C		00	01	10	11	04	05	H2	H3/H6
H1	-40 to +60	70			4					
K4	10 to 100	110			4					
L4	50 to 120	130			4					
S4	120 to 220	230	1.5	2.5	4	4	1.5	3	8	10
TH	150 to 270	280			5					
V9	230 to 350	360			6					

°F Units

Range		T _{max} °F	Microswitch - Option Switching Differential °F							
Code	°F		00	01	10	11	04	05	H2	H3/H6
HA	-40 to +140	158			7					
KC	50 to 212	230			7					
LB	120 to 250	270			7					
SE	250 to 430	450	2.7	4.5	7	7.2	2.7	5.4	14.4	18
TQ	300 to 518	540			9					
V0	450 to 660	680			11					



Approvals



GLOBAL CERTIFICATION

IECEX

INTRINSICALLY SAFE Certificate No. IECEX BAS 11.0104X

- Ex ia IIC T6 Ga (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex ia IIC T5 Ga (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex ia IIIC T85°C Da (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex ia IIIC T100°C Da (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)

FLAMEPROOF Certificate No. IECEX BAS 12.0081

- Ex d IIC T6 Gb (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex d IIC T5 Gb (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex tb IIIC T85°C Db IP66 (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex tb IIIC T100°C Db IP66 (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)



Functional Safety Certified

Meets the requirements of IEC 61508-2:2010 for use in safety related systems.

Systematic capability: SC 2;

Random Capability: Type A element

SIL2 @ HFT 0; Route 1_H and 1_S

Certificate No. Sira FSP 12017/05



EUROPEAN DIRECTIVE

Low Voltage Directive (LVD) 2014/35/EU

Compliant to LVD

Restriction of hazardous substances (RoHS 2) 2011/65/EU

Compliant to RoHS

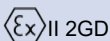
ATEX Directive 2014/34/EU

INTRINSICALLY SAFE Certificate No. Baseefa11ATEX0203X

- Ex ia IIC T6 Ga (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex ia IIC T5 Ga (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex ia IIIC T85°C Da (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex ia IIIC T100°C Da (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)

FLAMEPROOF Certificate No. Baseefa12ATEX0121

- Ex d IIC T6 Gb (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex d IIC T5 Gb (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex tb IIIC T85°C Db IP66 (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex tb IIIC T100°C Db IP66 (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)



Approvals



UK REGULATION

Electrical Equipment (Safety) Regulations 2016

Conform to UK SI 2016 No 1101 regulation

Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Conform to UK SI 2012 No. 3032

Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

Conform to UK SI 2016 No 1107 regulation

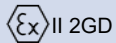
INTRINSICALLY SAFE Certificate No. BAS 22UKEX0174X

- Ex ia IIC T6 Ga (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex ia IIC T5 Ga (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex ia IIIC T85°C Da (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex ia IIIC T100°C Da (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)



FLAMEPROOF Certificate No. BAS22UKEX0060X

- Ex d IIC T6 Gb (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex d IIC T5 Gb (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex tb IIIC T85°C Db IP66 (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex tb IIIC T100°C Db IP66 (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)



EURASIAN CONFORMITY MARK

Hazardous Areas

INTRINSICALLY SAFE Certificate No. EA3C RU C-GB.HA65.B/01199/21



- 0 Ex ia IIC T6 Ga X (-25°C≤Ta≤+60°C) or (-60°C≤Ta≤+60°C)
- 0 Ex ia IIC T5 Ga X (-25°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex ia IIIC T135 °C Da X (-60°C≤Ta≤+80°C)

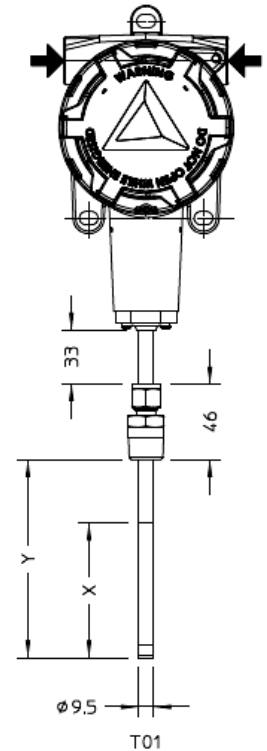
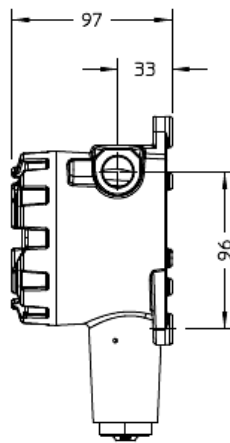
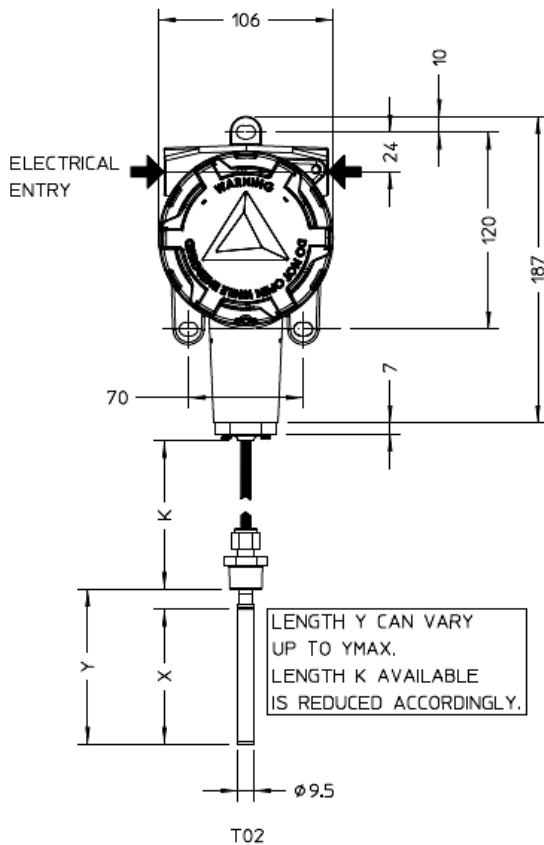
FLAMEPROOF Certificate No. EA3C RU C-GB.HA65.B/01199/21



- 1Ex d IIC T6 Gb X (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- 1Ex d IIC T5 Gb X (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)
- Ex tb IIIC T85°C Db X (-30°C≤Ta≤+65°C) or (-60°C≤Ta≤+65°C)
- Ex tb IIIC T100°C Db X (-30°C≤Ta≤+80°C) or (-60°C≤Ta≤+80°C)

If EAC certification is required, this must be evidenced to our sales team, at ordering stage, for correct marking of the instrument.

Dimensions



Models		T01	T02
Immersion Length, Y min	mm	120	120
	Inch	5	5
Immersion Length, Y max	mm	200	SEE NOTE
	Inch	8	SEE NOTE
Capillary Length, K	mm	-	2000
	Inch	-	79
Active Length, X	mm	82	82
	Inch	3	3

LENGTH Y CAN VARY UP TO YMAX. LENGTH K AVAILABLE IS REDUCED ACCORDINGLY.

Model	Weight (Kg)	Weight (lb)
WT01* / HT01* / 5T01	1.8	4,0
WT02* / HT02* / 5T02	1.8	4,0
AT01* / RT01* / 4T01*	3.9	8.6
AT02* / RT02* / 4T02	3.9	8,6

Weights will vary, according to the type and length of the sensing element.

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

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