Baumer
Passion for Sensors

RTNE4 - RTAE4

Industrial temperature switch with capillary, explosion proof

BOURDON
The Original by Baumer

Main Features

- Excellent repeatability
- Dead band adjustment for regulation
- Fix dead band for control and alarm
- Explosion proof Hazardous areas 1, 2, 21, 22

Applications

- Power generation safety equipment

Technical Data

Temperature range	-46 ... 0°C to 200 ... 270°C
Temperature	Process : -46 ... +270°C Ambient : -30 ... +55°C Storage : -40 ... +55°C
Repeatability	± 1% F.S. @ constant temperature cycle
CE conformity	Low Voltage Directive LVD 2006/95/EC ATEX Directive 94/9/EC
Protection rating	IP 66 (EN 60529)
Process connection	RTA : Copper alloy RTN : Stainless steel 1.4404 (316L)
Bulb	RTA : Copper alloy RTN : Stainless steel 1.4404 (316L)
Capillary	RTA : Copper alloy RTN : Stainless steel 1.4404 (316L) For types of protection see ordering details on page 5
Scale	Internal. Accuracy on reading ± 5% FS
Explosion proof housing	Aluminium epoxy painted Captive stainless steel screws

Mounting	3 back lugs for wall mounting
Ground connection	Via internal terminal block
Electrical connection	Terminal block with metallic cable gland for Ø 7 to 12 mm standard
Electrical function	See ordering code details on page 5
Adjustment	2 external adjustment screws on top of the case for set point and dead band
ATEX	Type examination certificate LCIE 03 ATEX 6231X EN 60079-0 : 2009 EN 60079-1 : 2007 EN 60079-31 : 2009 Marking CE 0081 Ex II 2 G D Ex d IIC T6 or T5 Gb Ex t IIIC IIC T80°C or T95°C Db IP6X T° ambient -20°C to +60°C (T6 or T80°C) or -20°C to +70°C (T5 or T95°C)

Options

Customer specific set point adjustment	Code SETP
Mounting on 2" pipe	Code 0407
Stainless steel tag plate and wire	Code 9941
Lead seal of the adjustment screws	Code 8990
Nuclear cleanliness (RTN only)	Code 0838

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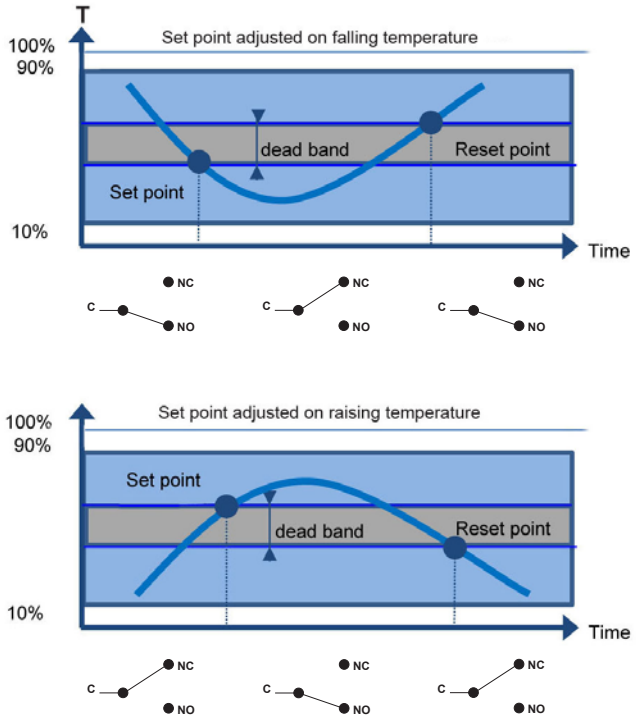
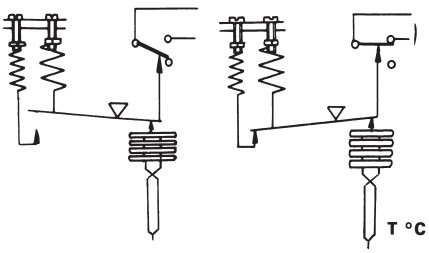
Principle



A vapour filled flexible sensing element actuates a microswitch by means of a lever. The set point is adjusted by means of a compressible spring installed in opposition.



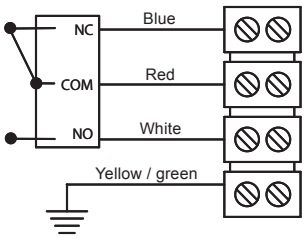
Set point and reset point must be between 10% and 90% of the selected scale.

Standard factory adjustment
Setpoint at 50% of the scale on falling temperature

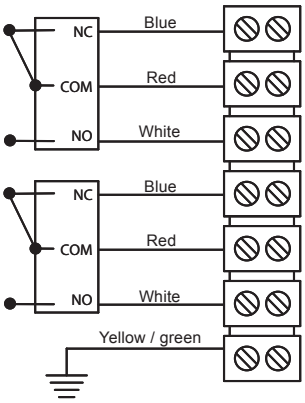
Customer specific factory adjustment (option SETP)
The following specifications have to be given with the order:
- Setpoint value
- Adjustment on falling or raising temperature
- Dead band value when using an adjustable dead band switch

Electrical connections

1 SPDT



2 SPDT



Hazardous areas : 1, 2, 21, 22

-20°C ≤ Ta ≤ +70°C	Dust IP6x	Gases
	T° surface	Class
Ta = 60°C	80°C	T6
Ta = 70°C	95°C	T5

<u>Important</u> : Maximum power dissipation in the case must not exceed 5 W

All necessary measures must be taken by the user, to avoid the calorific transfer from the fluid to the apparatus head increasing the head's temperature to such that it reaches the self-ignition temperature of the gas in which it is used.

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Micro switches characteristics

Switch code	N (T)	A (B)	M (K)	C (W)	E (F)	D (V)
Type	**Tropicalized**	**Standard**	**Gold contact**	**Hermetic**	**Ultra sensitive**	**Ultra sensitive Hermetic**
6 Vdc	0.1 ... 8 A	0.4 ... 15 A	10 ... 50 mA	5 mA ... 4 A	0.4 ... 1 A	0.4 ... 4 A
12 Vdc	0.1 ... 8 A	0.4 ... 15 A	10 ... 50 mA	5 mA ... 4 A	0.4 ... 1 A	0.4 ... 4 A
24 Vdc	0.1 ... 8 A	0.4 ... 6 A	10 ... 50 mA	5 mA ... 4 A	0.4 ... 1 A	0.4 ... 4 A
30 Vdc	0.1 ... 8 A	0.4 ... 6 A	10 ... 10 mA	5 mA ... 3 A	0.4 ... 1 A	0.4 ... 2 A
48 Vdc	0.1 ... 8 A	0.4 ... 6 A	10 ... 50 mA	5 mA ... 3 A	N/A	N/A
110 Vdc	N/A	0.1 ... 0.5 A	10 ... 50 mA	5 mA ... 1 A	N/A	N/A
220 Vdc	N/A	0.1 ... 0.25 A	10 ... 50 mA	5 mA ... 0.5 A	N/A	N/A
115 Vac	0.1 ... 10 A	0.4 ... 15 A	10 ... 50 mA	50 mA ... 3 A	0.4 ... 10 A	N/A
250 Vac	0.1 ... 5 A	0.2 ... 15 A	10 ... 10 mA	50 mA ... 2.5 A	0.2 ... 10 A	N/A
Dielectric rigidity between contacts and ground	2000 V	2000 V	2000 V	1500 V	2000 V	1000 V

Adjustable ranges

Scale	T_{Max} accidential	Code	Micro-switch dead band [1]							
			Adjustable dead band				Fixed dead band			
			N (T*) A (B*) M (K*)		C (W*)		E (F*)		D (V*)	
			10%	90%	10%	90%	10%	90%	10%	90%
°C			°C							
-46 ... 0	40	**400**	6 - 13	3 - 13	12 - 18	6 - 18	2.25	1.2	7.5	3.7
-20 ... 20	60	**401**	4.5 - 12	2.2 - 12	9 - 15	6 - 15	1.5	0.75	6	3
0 ... 45	60	**402**	6 - 13	3 - 13	10 - 18	6 - 18	2.25	1.05	7.5	3.7
40 ... 120	145	**403**	7.5 - 24	4.5 - 24	15 - 30	9 - 30	3	1.8	9	6
100 ... 160	180	**414**	7.5 - 18	4.5 - 18	13 - 22	7.5 - 22	3	1.5	9	4.5
20 ... 80	100	**415**	7.5 - 18	4.5 - 18	13 - 22	7.5 - 22	3	1.5	9	4.5
160 ... 250	290	**406**	9 - 24	6 - 24	16 - 33	10 - 33	3.75	1.8	12	6.7
70 ... 150	175	**408**	7.5 - 24	6 - 24	15 - 30	9 - 30	3	1.5	9	6
130 ... 190	210	**412**	7.5 - 18	4.5 - 18	13 - 22	7.5 - 22	3	1.5	9	4.5
200 ... 270	290	**413**	7.5 - 18	4.5 - 18	13 - 22	7.5 - 22	-	1.5	9	4.5

(*) For version with 2 microswitches lower values of the dead band must be multiplied x 1.5

[1] The value of the dead band is depending on the value of the set point.
This table contains the dead band values for set point adjustment at 10% and 90% of the selected scale. For adjustable dead band the lower value corresponds to the dead band spring totally released and the higher corresponds to the dead band spring fully tensed. For other set points the dead band value can be calculated by linear interpolation between the values at 10% and 90%.

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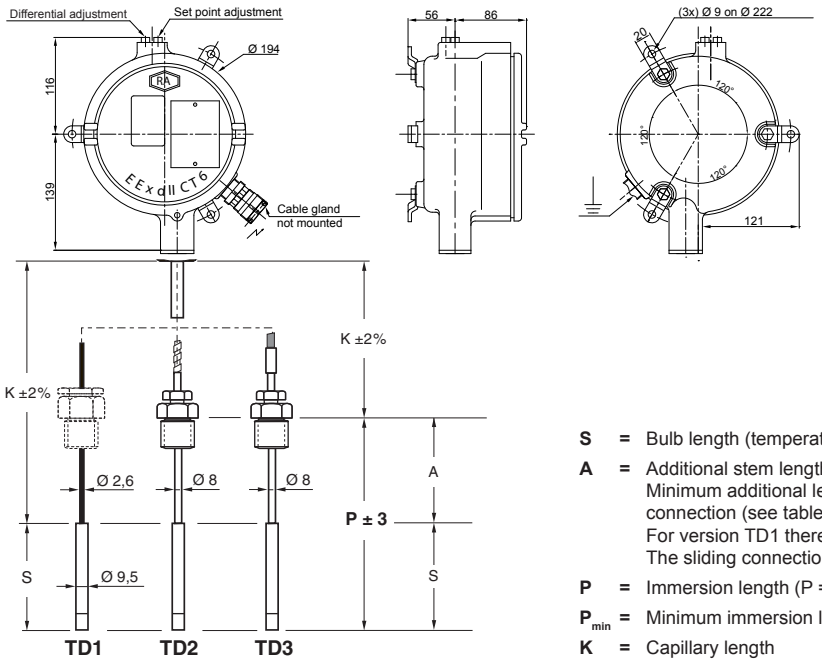
Dimensions (mm)



Minimum additional stem length (A_{min}/mm)

Connection	TD1	TD2	TD3
Without	0	0	0
G1/2	0	18	18
1/2 NPT	0	21	21

S = Bulb length (temperature sensitive part, see tables below)

A = Additional stem length
Minimum additional length A_{min} depends on type of capillary and process connection (see table above)
For version TD1 there is no additional stem length (A=0).
The sliding connection is mounted on the capillary.

P = Immersion length (P = S + A)

P_{min} = Minimum immersion length (P_{min} = S + A_{min})

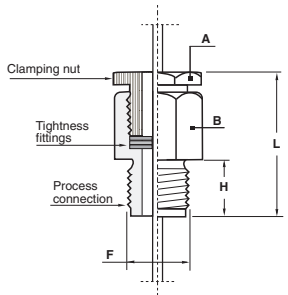
K = Capillary length

Bulb length (S) according to the capillary length (K) and the temperature range (code)

Bulb Ø 14 mm	Code	400	401	402	403	408	412	413	414	415
K = 0 ... 2 m	S / mm	80	80	80	80	80	80	80	80	80
K = 3 ... 7 m	S / mm	100	100	100	100	100	100	100	100	100
K = 8 ... 16 m	S / mm	150	150	150	150	150	150	150	150	150
K = 17 ... 20 m	S / mm	180	180	180	180	180	180	–	180	180

Bulb Ø 9.5 mm	Code	400	401	402	403	408	412	413	414	415
K = 0 ... 2 m	S / mm	155	155	155	155	155	155	155	155	155
K = 3 ... 7 m	S / mm	200	200	200	200	200	200	200	200	200
K = 8 ... 16 m	S / mm	300	300	300	300	300	300	300	300	300
K = 17 ... 20 m	S / mm	370	370	370	370	370	370	–	370	370

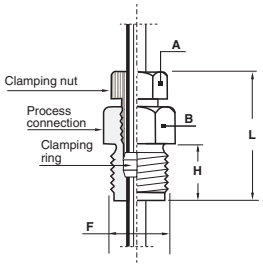
Stainless steel sliding male connection (TD1)



Thread and sizes		
F	G 1/2	1/2 NPT
H	18	21
L	43	46
A	27/flat	27/flat
B	27/flat	27/flat

Waterproof after tightening mounted on the capillary.

Stainless steel sliding male connection (TD2/3)



Thread and sizes		
F	G 1/2	1/2 NPT
H	18	21
L	36	40
A	17/flat	17/flat
B	23/flat	23/flat

After tightening of the clamping nut, the stem is fixed in the process connection. Tight up to 40 bar.

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Ordering details RTNE4 - RTAE4

	RT	–		E		.	4xx	.						/

Model

Industrial temperature switch	RT

–

Type of the bulb

Copper alloy bulb	A
Stainless steel bulb	N

Approvals

ATEX explosion proof	E

Type of micro switches

	Deadband	
1 SPDT standard changeover switch	Adjustable	A
2 SPDT standard changeover switch	Adjustable	B
1 SPDT hermetically changeover switch	Adjustable	C
2 SPDT hermetically changeover switch	Adjustable	W
1 SPDT ultra sensitive changeover switch	Fix	E
2 SPDT ultra sensitive changeover switch	Fix	F
1 SPDT hermetically, ultra sensitive changeover switch	Fix	D
2 SPDT hermetically, ultra sensitive changeover switch	Fix	V
1 SPDT gold contact changeover switch	Adjustable	M
2 SPDT gold contact changeover switch	Adjustable	K
1 SPDT tropicalized changeover switch	Adjustable	N
2 SPDT tropicalized changeover switch	Adjustable	T

.

Temperature range (°C)

-46 ... 0	400
-20 ... 20	401
0 ... 45	402
40 ... 120	403
100 ... 160	414
20 ... 80	415
160 ... 250	406
70 ... 150	408
130 ... 190	412
200 ... 270	413

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Type of capillary

TD1	Stainless steel capillary without protection	1
TD2	Stainless steel capillary with stainless steel protection	2
TD3	Stainless steel capillary with stainless steel protection and PVC coating	3

Capillary length (K)

1 meter	1
2 meters	2
3 meters	3
4 meters	4
5 meters	5
6 meters	6
7 meters	7
8 meters	8
9 meters	9
10 meters	A
11 meters	B
12 meters	C
13 meters	D
14 meters	E
15 meters	F
16 meters	G
17 meters	H
18 meters	J
19 meters	K
20 meters	L

Immersion length (P) — **Immersion length (P) = Bulb length (S) + additional stem length (A)**

P = S + A_{min}	(A_{min} depends on type of capillary and process connection, for S and A_{min} see tables on page 4)	0
P = 150 mm	(not for TD1)	3
P = 160 mm	(not for TD1)	2
P = 250 mm	(not for TD1)	4
P = 400 mm	(not for TD1)	5
P = 600 mm	(not for TD1)	6
P = 1000 mm	(not for TD1)	D

Bulb diameter

Ø 14 mm (standard)	E
Ø 9.5 mm	C

Process connection

Without	0
G1/2	3
1/2 NPT	6

Options to be added behind the / (see example below) /

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Ordering example with options

RT	–	A	E	A	.	400	.	1	2	2	E	3	/	SETP	_	9941

- Industrial temperature switch
- Copper alloy bulb
- With ATEX explosion proof
- 1 SPDT standard changeover switch
- Temperature range -46 ... 0 °C
- TD1 stainless steel capillary without protection
- 2 meters capillary
- Immersion length P = 160 mm
- Bulb diameter Ø 14mm
- Process connection G1/2
- Option : Customer specific set point adjustment
- Option : Stainless steel tag plate and wire