



# ULTIMHEAT

## HEAT & CONTROLS



(Atex, IECex, CCCex)

# EXPLOSION PROOF THERMOSTATS & CONNECTION BOXES


- Thermostats without Explosion proof certification: See catalogues No.1
- Thermostats incorporated inside various boxes, housing & cabinets: See catalogue No. 2 & 3

Contact us
















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## Summary

Section 1	Summary		P1-P4
Section 2		Historical and Technical introduction	P1-P6
Section 3	Alphabetical product list, and numerical reference list		P1-P4

### Fixed temperature limiters for incorporation, **wires or cables** electrical connection

P1-P14

Section 4		UZ	 II 2G Ex mb IIC T4 Gb  II 2D Ex tb IIIC T125°C Db	<b>TYPE UZ. Miniature surface mounting disc limiter, cable output, rating 9A 240V max, calibration temperature from 50 °C to 100°C (Current sensitive)</b>	P3-P4
		UX	 II 2G Ex mb IIC T3 Gb  II 2D Ex tb IIIC T180°C Db	<b>TYPE UX. Miniature surface mounting disc limiter, cable output, rating 9A 240V max, calibration temperature from 50 °C to 150°C (Current sensitive)</b>	P5-P6
		4YC	Ex « n » (partial)	<b>TYPE 4YC. Limiter designed to comply ONLY with IEC60079-0: 2011 (Explosive atmospheres, general requirements), § 26.5.1.2 and IEC 60079-15 : 2010 (Explosive atmospheres, Equipment protection by type of protection "n") § 19 ; 22.5.1 ; 22.5.2 ; 22.5.3.1 ; 22.5.3.2 and 22.5.3.3. Maximum rating 9A 240V. Waterproof. (TÜV certificate GC/70269203) Calibration temperature 5 to 90°C</b>	P7
		4VA	 II 2G Ex mb IIC T4 Gb  II 2D Ex tb IIIC T125°C Db	<b>TYPE 4VA. Disc limiters, cable output. Rating 12A 240V. Temperature calibration from 5 to 100°C. Various body design available (A, B, C, D, E, F), for ambient control, surface control or liquids control. It is possible to design new bodies without request to apply for new approvals</b>	P8-P9
		4VB	 II 2G Ex mb IIC T4 Gb  II 2D Ex tb IIIC T125°C Db	<b>TYPE 4VB, Disc limiters wires output. Rating 12A 240V. Temperature calibration from 5 to 100°C. Various body design available (A, B, C, D, E, F), for ambient control, surface control or liquids control. It is possible to design new bodies without request to apply for new approvals</b>	P8-P9



Section 4		4XA	 II 2G Ex mb IIC T3 Gb   II 2D Ex tb IIIC T180°C Db	<b>TYPE 4XA. Disc limiters cable output. Rating 12A 240V. Temperature calibration from 5 to 150°C.</b> Various body design available (A, B, C, D, E, F), for ambient control, surface control or liquids control. It is possible to design new bodies without request to apply for new approvals	P10-P11
		4XB	 II 2G Ex mb IIC T3 Gb   II 2D Ex tb IIIC T180°C Db	<b>TYPE 4XB, Disc limiters wires output. Rating 12A 240V. Temperature calibration from 5 to 150°C.</b> Various body design available (A, B, C, D, E, F), for ambient control, surface control or liquids control. It is possible to design new bodies without request to apply for new approvals	
		Y94	 II 2G Ex eb mb IIC T6 Gb   II 2D Ex tb IIIC T180°C Db	<b>TYPE Y94. Disc limiter inside enclosure with screw terminals connection box. Electrical rating 12A 240V. Calibration from 5 to 80°C.</b> Connection block for 0.5 to 4mm <sup>2</sup> wires, 3 to 9 terminals. 1 or 2 M20 cable glands.	

### Thermostats and limiters with bulb and capillary sensing element, wires or cable electrical connection

P1-P18

Section 5		KAA-3 KAB-3 KAC-3	 II 2G Ex db IIC T5 Gb   II 2D Ex tb IIIC T95°C Db	<b>Temperature control, front or rear mounting, cable connection</b>	P3-P4
		KAA-4 KAB-4 KAC-4	 II 2G Ex db IIC T5 Gb   II 2D Ex tb IIIC T95°C Db	<b>Temperature control, Din Rail mounting, cable</b>	P5-P6
		KAA-5 KAB-5 KAC-5	 II 2G Ex db IIC T5 Gb   II 2D Ex tb IIIC T95°C Db	<b>Temperature control, Rear mounting, cable connection</b>	P7-P8

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




Section 5		<p>KA A-6 KAB-6 KAC-6</p>	<p> II 2G Ex db IIC T5 Gb</p> <p> II 2D Ex tb IIIC T95°C Db</p>	<p><b>Temperature control, front mounting, cable connection</b></p>	P9-P10
		<p>KA A-K KAB-K KAC-K</p>	<p> II 2G Ex db IIC T5 Gb</p> <p> II 2D Ex tb IIIC T95°C Db</p>	<p><b>Temperature control, front or rear mounting, wire connection</b></p>	P11-P12
		<p>KA A-L KAB-L KAC-L</p>	<p> II 2G Ex db IIC T5 Gb</p> <p> II 2D Ex tb IIIC T95°C Db</p>	<p><b>Temperature control, Din Rail mounting, wire</b></p>	P13-P14
		<p>KA A-M KAB-M KAC-M</p>	<p> II 2G Ex db IIC T5 Gb</p> <p> II 2D Ex tb IIIC T95°C Db</p>	<p><b>Temperature control, Rear mounting, wire connection</b></p>	P15-P16
		<p>KA A-N KAB-N KAC-N</p>	<p> II 2G Ex db IIC T5 Gb</p> <p> II 2D Ex tb IIIC T95°C Db</p>	<p><b>Temperature control, front mounting, wire connection</b></p>	P17-P18

**Thermostats and limiters, connection inside EX « e » aluminum housing with incorporated junction block**

**P1-P8**







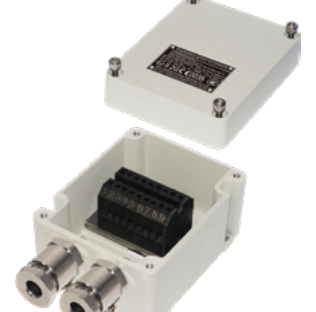


Section 6		<p>Y97KA</p>	<p> II 2G Ex eb db IIC T6 Gb</p> <p> II 2D Ex tb IIIC T80°C Db</p>	<p><b>TYPE Y97KA. Room thermostats. Electrical rating 15A 250V; 10A 400V. Temperature setting by printed knob. Temperature range 4-40°C. Also available with screw driver adjustment or fixed setting. Screw terminal for 0.5 to 4mm<sup>2</sup> wires. Two M20 cable glands</b></p>	P3-P4
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		Y98KA	<p> II 2G Ex eb db IIC T6 Gb</p> <p> II 2D Ex tb IIIC T80°C Db</p>	<p>TYPE Y98KA. Thermostats with remote bulb. Electrical rating 15A 125-250V; 10A 400V. Temperature setting by printed knob. Temperature ranges <b>4-40°C, 30-90°C, 30-110°C, 50-200°C, 50-300°C</b>. Also available with screw driver adjustment or fixed setting. Screw terminal for 0.5 to 4mm<sup>2</sup> wires. Two M20 cable glands</p>	P5-P6
		Y99KA	<p> II 2G Ex eb db IIC T6 Gb</p> <p> II 2D Ex tb IIIC T80°C Db</p>	<p>TYPE Y99KA. Rod thermostats Electrical rating 15A 125-250V; 10A 400V. Temperature setting by printed knob. Temperature ranges <b>4-40°C, 30-90°C, 30-110°C, 50-200°C, 50-300°C</b>. Also available with screw driver adjustment or fixed setting. Rod length on request. Standard fittings ½" BSPT and ½" NPT. Screw terminal for 0.5 to 4mm<sup>2</sup> wires. Two M20 cable glands</p>	P7-P8












### Connection boxes and accessories

P1-P26

Section 7		Y9Z	<p> II 2G Ex eb IIC T4 Gb</p> <p> II 2D Ex tb IIIC T125°C Db</p>	<p>TYPE Y9Z. Aluminium junction box, without holes. IP65, 140 × 110 × 90mm. Maximum temperature <b>125°C</b>. M6 ground terminals.</p>	P3
		Y91	<p> II 2G Ex eb IIC T4 Gb</p> <p> II 2D Ex tb IIIC T125°C Db</p>	<p>TYPE Y91. Aluminium junction box. IP65, 140x110x90mm. With 1 to 4 M20 cable glands, with or without DIN rail or connection block bracket. Maximum temperature <b>125°C</b>. M6 ground terminals.</p>	P4
		Y96	<p> II 2G Ex eb IIC T5 Gb</p> <p> II 2D Ex tb IIIC T95°C Db</p>	<p>TYPE Y96. Aluminium junction box. IP65, 140x110x90mm. With mounting board with screw terminals connection blocks for cables 0.5 to 4mm<sup>2</sup> and two M20 cable glands. Maximum temperature <b>95°C</b>. M4 ground terminals.</p>	P5

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Section 7		6YTEW	 II 2G Ex eb IIC T5 Gb  II 2D Ex tb IIIC T95°C Db	<b>TYPE 6YTEW. Heating cable termination.</b> Can be used on standard heating cable or explosion proof heating cable. Maximum temperature <b>95°C</b> . Seals are selected in factory based on dimensions of heating cable sample received.	P6-P8
		Y40	 II 2G Ex eb IIC T5 Gb  II 2D Ex tb IIIC T95°C Db	<b>TYPE Y40. Self-stripping junction box, with 2 cable glands.</b> Can be used on standard heating cable or explosion proof heating cable. Maximum temperature <b>95°C</b> . Seals are selected in factory based on dimensions of heating cable sample received. Available with flat wall mounting bracket or with plastic or stainless-steel brackets for pipe mounting	P9-P14
		Y41	 II 2G Ex eb IIC T5 Gb  II 2D Ex tb IIIC T95°C Db	<b>TYPE Y41. Self-stripping junction box, with four cable glands.</b> Can be used on standard heating cable or explosion proof heating cable. Maximum temperature <b>95°C</b> . Seals are selected in factory based on dimensions of heating cable sample received. Available with flat wall mounting bracket or with plastic or stainless-steel brackets for pipe mounting	P15-P19
			66MQ, 66MG 66MZ, 66ME 66CP, 66EN	<b>Knobs and dials for explosion proof thermostats</b>	P20-P22
			6YTQW46, 6YTQV47, 6YTQUVA5	<b>Pipe mounting legs for explosionproof enclosures</b>	P23-P26



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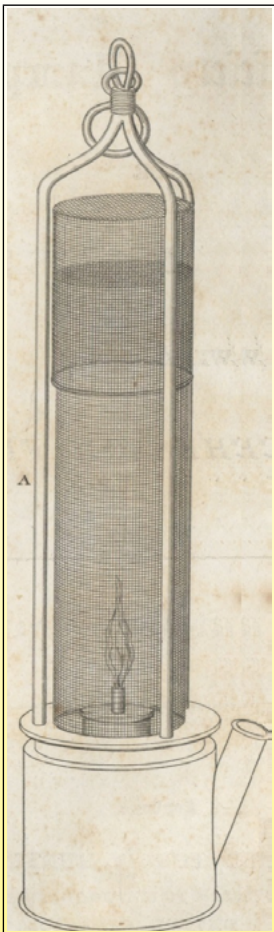
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# **Section 2**

## **Historical and Technical introduction to explosion proof thermostats**



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1815 the miner safety lamp, invented by Humphry Davy

The explosion of firedamp in mines caused by the flames of oil lamps, was the cause of many accidents and caused hundreds of deaths. This explosion had a double danger : methane gas and coal dust. When the methane exploded, the explosion was generally followed by a much more violent explosion of dust (the dust explosion) produced by inflammation of the cloud of coal dust produced by the initial explosion.

The oldest listed, but certainly not the first tragedy, was the one of the pit of the Barbeau de Wez, near Liège in Belgium, which caused 94 victims in 1514.

The first solution was to hire minors, volunteers and paid more to ignite the gas every day.

Firedamp was " lit " before the miners arrival. For this purpose, a worker called penitent (because of the suit which he was clothed) or gunner, covered with wet leather or fabric clothes, face protected by a mask equipped with glass windows and carrying a lighted candle, was responsible for igniting the gassy pockets, mostly located in the upper parts of galleries.

Alphonse Meugy describes how to operate in his book, " History of the Mines in Rive-de-Gier " (1848) :

*" Two workers called gunners used to go down to the mine a few hours before their peers, with strong canvas clothes, and covered with a kind of head cap. They were moving at a certain distance of the working faces and while one of them was hiding in a nearby gallery, the other one, armed with a pole bearing a burning wick at its end, was approaching by crawling until the flame of the wick was beginning to grow. He then was laying, face to the ground with his clothes soaked and was lifting the pole to the top of the excavation. This was producing a detonation which often had the effect of seriously injuring the gunner. He was rescued by his colleague. "*

Ponies carrying a lit candle were also used. They were watered then sent to the galleries in the hope of creating tiny explosions.

After many accidents, the English Humphry Davy discovered in 1815 that a flame enclosed in a very fine mesh does not ignite firedamp. Miners lighting became safer.

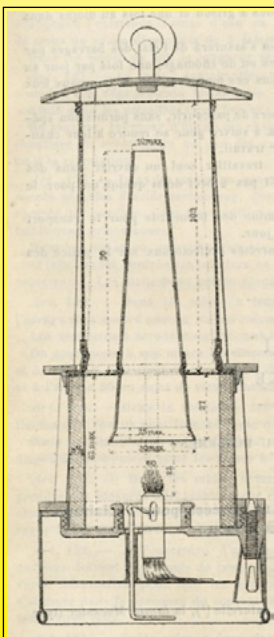
The practice of the " penitent " or " gunner " was gradually outlawed in the mines around 1835, after the Davy lamp being almost universally used in France since 1823.

This lamp, which was called " the Davyne " in France, seemed likely to provide all the necessary safety guarantees against ignition of firedamp but after many explosions occurred in coal mines where this lamp was used, it was soon demonstrated it was not flawless, and that it could only reduce the chances of explosions, without preventing them in all cases. In particular, it had the following defects :

- *The inflammation of a mixture of air and carbon hydrogen can occur through the metallic canvas, in galleries where there is a quick airflow, because then, the lamp flame blushes the mesh or passes through.*

- *The slightest shock can deform or even tear open the mesh, and thus render the lamp ineffective.*

- *The metal-mesh in contact with the oil reservoir, is soon greased and traps fuel dust, thus forming a paste which can be ignited, both inside and outside.*



1842 The Mueseler miner lamp

In 1842 the Liège Mathieu-Louis Mueseler invented a lamp that had the following advantages :

- *It is quickly extinguished when there is plenty of explosive gases, even in a mixture with pure hydrogen.*

- *It shines best and can be placed away from the worker and free tools, and best suited in galleries having strong air streams.*

- *The wire mesh, being remote from the tank , do not permeate to oil. Only a dry dust can stick but it is easily removable.*

- *It is provided with two wire meshes, one horizontal and the other vertical, so that one remains intact when the second is to be torn.*

- *Finally , the air flow to activate the combustion is from top to bottom instead of being laterally, provision that gives the inestimable advantage over all other safety lamps, of turning off suddenly when the air is charged with sufficient carbon hydrogen to provide an explosive mixture.*

*This lamp spread in the basin of Seraing and other coal centers in Belgium and, in 1864, its use was prescribed by the Belgian Government. It was then adopted in a number of mines in France and England.*

Lighting miners became safer. The use of these lamps, however remained linked to the respect of safety, and there were many accidents resulting from human carelessness. Here is an example, one of my ancestors, Auguste-Joseph Jumeau, was one of the victims :

On Saturday, March 6, 1852 , at the pit " Ferrand " at Elouges in The Borinage (Belgium), the morning shift just came down in the galleries, it was the last day of work in this mine, as it should be closed to allow upgrades and safety works. The pit had a small diameter and allowed a two buckets traffic only (large casks used to bring the coal up to the surface and the movements of people) attached to hemp ropes.



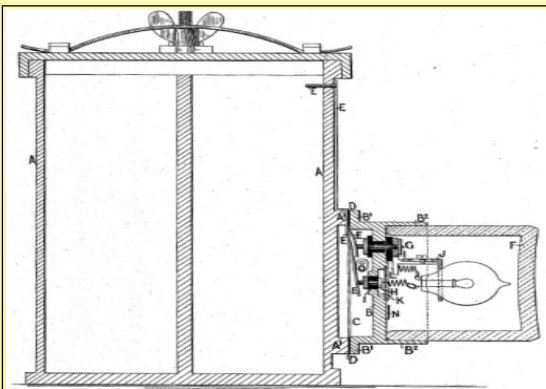
At 20 meters of the hanging point, at the entrance of a gallery, was a tank containing water for the mine horses. Around 10 AM, the worker in charge of treating horses went there to draw water. As the lamp did not light enough (probably a Davy lamp type), he imprudently opened it. As soon as the flame in contact with the atmosphere, an explosion rocked the mine. The horse trainer was thrown against a wall and was horribly burned. He survived nevertheless. His many companions were less fortunate : 63 miners, men, women and children were killed.



1862 Dumas et Benoît's  
Electrical miner lamp

A risk still remained to be solved : the ignition of the lamp, which forced to back it out of the well if accidentally extinguished. In the 1890's, when kerosene replaced oil in lamps, electric ignition systems for miner lamps were tested, having enclosures that did not let the flame out (Patent by William Ackroyd, Morley, England).

The first electric portable lamps with batteries offered at the Academy of Sciences of Paris in 1862 by MM. Dumas and Benoit, did not definitely meet safety requirements, unlike earlier expectations that set forth their lighting tube enclosed in a sealed tube as not fearing the ignition of firedamp (featured in the Journal of Industrial Engineering, July 1863).



1884 Cad electrical lamp

In 1884, English Theophilus Cad, from Forest Gate, England, invented an electric lamp whose switch was enclosed in what can be considered the first electrical flameproof enclosure (British Patent No. 806 of 5 January 1884).

Timidly used from 1890, electric lamps grew very slowly between 1920 and 1930.

But shortly after the introduction of electricity in coal mines, it was also discovered that lethal explosions could be initiated by fixed electrical equipment such as lighting, signals or motors.

Around 1910, 12 volts DC signaling systems considered safe appeared.

However, in October 1913, took place the largest explosion of British mines, that of Senghenydd Colliery, where 439 miners perished. It was suspected an alarm system, consisting of two parallel bare wires running along the galleries, which allowed any miner wishing to report a problem to the surface to make it by contacting momentarily the two wires with a metal tool. But the bell inductance coils caused a spark, which was probably the cause of the explosion. It was then determined that these products might be secured by a careful design, the forerunner of the "intrinsic safety". Following this disaster, the miners demanded the withdrawal of the electrical equipment of pits. Then began the development of electric devices called "explosion proof", which inevitable sparks could only occur in a protective envelope preventing from igniting the surrounding gas.

Historically, the topic of Hazardous (Classified) Locations first appeared in the National Electrical Code (NEC) in 1923, when a new article entitled "Extra-Hazardous Locations" was accepted. This article addressed rooms or compartments in which highly flammable gases, liquids, mixtures or other substances were manufactured, used, or stored.

In the investigations leading to approval of loading and conveying machines the bureau is guided by the provisions of Schedule 2C. issued on February 3, 1930. This schedule classified the various electrical parts according to their liability to sparking and specified the type of enclosure to be used for each class. As required by the schedule, a part that may produce sparks during normal operation must be enclosed in an explosion-proof casing; that is, an explosion of gas in such a casing must not ignite the gas surrounding the casing or discharge flames from any joints, bearings, or lead entrances. The object of the bureau's investigations is therefore to determine by test and inspection whether or not the enclosures are suitable to the purpose for which designed. The explosion-proof qualities are demonstrated by tests in which gas is exploded within the casings. Other tests are made to check the adequacy of electrical clearances and insulation. In addition to the tests, a detailed inspection of parts, including a careful check against drawings and specification is made. These drawings constitute the chief record of the equipment investigated



and therefore must be complete in detail to cover adequately the construction to be approved. A description of test equipment and methods followed in conducting these investigations is given in Bureau of Mines Bulletin 305, Inspection and Testing of Mine-Type Electrical Equipment for Permissibility, published in 1929.

In Europe, the first German standards on "The protection of electrical installations in hazardous areas" were published in 1935, and gave guidelines for the installation of electrical equipment in hazardous areas. In 1938 appeared a fundamental change dividing the installation requirements (VDE 0165) and the design requirements of products (VDE 0170 / 0171).

Standards of product design included the types of basic protection against explosions such as flameproof enclosures, immersion in oil and increased safety. Components were designed to be protected against explosions and housed in industrial type housings that were resistant to weathering. This led to the development of flameproof components mounted inside increased safety housings. Devices designed to this standard were marked with the symbol (Ex). During the 1960's, the European Community was founded to establish a free trade area in Europe. **To reach this goal, technical standards needed to be harmonized.** Consequently, the European Organisation for Electrotechnical standardization (CENELEC) was created. A new set of European standards describing devices for explosive environments (EN 50014 - EN 50020) was published in 1972. In 1975, the first EU directive for devices used in hazardous areas, known as "Directive on the protection against explosions", was published. In 1978, the first edition of European standards was published by CENELEC which covered installation techniques.

It must be noted that the standards were taking in account the original comments of Davy on the gas inflammation in contact with the overheated protection grid of miners lamps by issuing rules about the surface temperature of enclosures (T), and also the minimum interstice to avoid the flame passage "e".

IEC standards currently in force in 2014 for equipment for explosive atmospheres are :

IEC 60079-1 : Flameproof enclosures "d",

- IEC 60079-2 : Envelopes internal pressure "p",
- IEC 60079-5 : Powder filling "q",
- IEC 60079-6 : oil immersion "o",
- IEC 60079-7 : increased safety "e",
- IEC 60079-11 : intrinsic Safety "i",
- IEC 60079-15 : Type of protection "n",
- IEC 60079-18. Encapsulation "m".

They are supplemented by the following equipment standards :

- IEC 60079-25,
- IEC 60079-26,
- IEC 62013-1,
- IEC 62086-1.

At their transcription into European standards, the IEC prefix is replaced by EN.



## Protections systems against explosions used in products described in this catalogue

**Electromechanical thermostats** have an important characteristic that makes critical their use in potentially explosive atmospheres : the opening and closing of their electrical contact, which occurs regularly during their normal operation, produces a spark between the contacts. If they are not intended and designed specifically for being used in hazardous areas, their use becomes particularly dangerous because this spark is sufficient to ignite the surrounding atmosphere.

Historically, the solution was to use standard thermostats, and enclose them in a cast iron enclosure, with large sealing surfaces and a minimum gap between cover and frame, (described as " d " style enclosures in EN 60079-1, formerly EN50018), so that if an explosion occurred around the electrical contact, it could not extend outside the enclosure. This resulted in heavy, massive and bulky devices because this enclosure had itself to withstand the explosive ignition of the gas mixture which filled it.

Although this solution is still used by some manufacturers, we have developed over the past 10 years a concept for light and compact products, limiting the flameproof area to the immediate environment of the switch.

This solution allows for devices with a direct output cable (or wires), avoiding the electrical connection inside the enclosure. Thermostats, whose sizes are similar to conventional thermostats can be incorporated, according to the customer's choice, in their own mechanical protection enclosure and electrical connection is carried away in a junction box that meets the applicable requirements of environment and hazardous areas standards. This is the reason why you will find different types of thermostats for explosive atmospheres in this catalog :

- **Thermostats with wires electrical connection** : (They are those having the smallest footprint) to allow installation and connection in a increased safety (Ex 'e' ) enclosure, but because of their components approval, it is required to apply for an additional approval of the customer enclosure with all its equipment. This solution, although these models of thermostats are the most economical, is therefore valid for large quantities applications only.

- **Thermostats with cable electrical connection** : In these devices, the thermostat and cable are considered as a product, and meet the hazardous area requirements if their installation instructions are fulfilled. In particular, they can be used without additional protective enclosure, by, for example, mounting them directly on a panel. It is not necessary to request an additional certificate. This solution also allows mounting the thermostat in a mechanical and ingress protection enclosure, which is not certified as equipment for explosive atmospheres. However, the cable must be mechanically protected, and the connection at its end must be made in a increased safety (Ex 'e') approved junction box or outside the hazardous area.

- **Thermostats incorporated inside increased safety metal enclosures, (Ex approval " d " + " e " )**.

The explosion-proof thermostat is installed and connected in an increased safety enclosure, specially designed for thermostat. This solution allows electrical connection inside the housing, but does not allow thermostat set point adjustment by opening the enclosure when energized. The cable exits and the capillary cable gland must be Ex-" e " certified cable glands, and the terminals are also Ex-" e " certified, and cannot be modified or replaced by other models without cancelling the approval.



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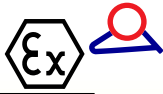
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# **Section 3**

## **Alphabetical product list, and numerical reference list**



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## References list

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4VA1B60*0F5040D0	4XB1B60*0FG0F0D0	KAA020500VAA4	UXV6013058510B1
4VA1B60*0F7060D0	4YC1A10*0F5040D0	KAA-20050VBA5	UXV6014059310B1
4VA1B60*0F8070D0	4YC1A10*0F7060D0	KAA000100VCA5	UXV6015056990B1
4VA1B60*0FA090D0	4YC1A10*0F7565D0	KAA000200VDA5	UZV1005053810B1
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4VB1B30*0F5040D0	4YC1A30*0F7060D0	KAA000100VCA6	UZV3007055010B1
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4VB1B30*0FA090D0	4YC1A30*0F8575D0	KAA020400VFA6	UZV6005053810B1
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4XA1B00*0FG0F0D0	66MG006*****	KAA020500VAAL	Y94VB2C1E1004CC2*
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4XB1B00*0FB0A0D0	6YTQTV66	KAA020500VAAN	Y96J9000S900003
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4XB1B30*0FA595D0	KAA000200VDA3	UXV1014059310B1	Y97KAA-35035S11K
4XB1B30*0FB0A0D0	KAA000300VEA3	UXV1015056990B1	Y98KAA000060L51K
4XB1B30*0FD0C0D0	KAA020400VFA3	UXV3010557010B1	Y98KAA004040L41K
4XB1B30*0FE0D0D0	KAA020500VAA3	UXV3011057210B1	Y98KAA030090L61K
4XB1B30*0FG0F0D0	KAA-20050VBA4	UXV3013058510B1	Y98KAA030110L71K



## Alphabetical product list, and numerical reference list



Y98KAA050200L81K	Y99KAA-10040221K	Y9HKAA050200L81K	Y9IKAA-10040221K
Y98KAA050300L91K	Y99KAA-35035211K	Y9HKAA050300L91K	Y9IKAA-35035211K
Y98KAA-10040L21K	Y9GKAA000060S51K	Y9HKAA-10040L21K	Y9Z00000000
Y98KAA-35035L11K	Y9GKAA004040S41K	Y9HKAA-35035L11K	Y9Z20000000
Y99KAA000060251K	Y9GKAA-10040S21K	Y9IKAA000060251K	Y9Z20200000
Y99KAA004040241K	Y9GKAA-35035S11K	Y9IKAA004040241K	Y9Z20202000
Y99KAA030090261K	Y9HKAA000060L51K	Y9IKAA030090261K	Y9Z20202020
Y99KAA030110271K	Y9HKAA004040L41K	Y9IKAA030110271K	
Y99KAA050200381K	Y9HKAA030090L61K	Y9IKAA050200381K	
Y99KAA050300391K	Y9HKAA030110L71K	Y9IKAA050300391K	

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Update 2023/11/17



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# Section 4

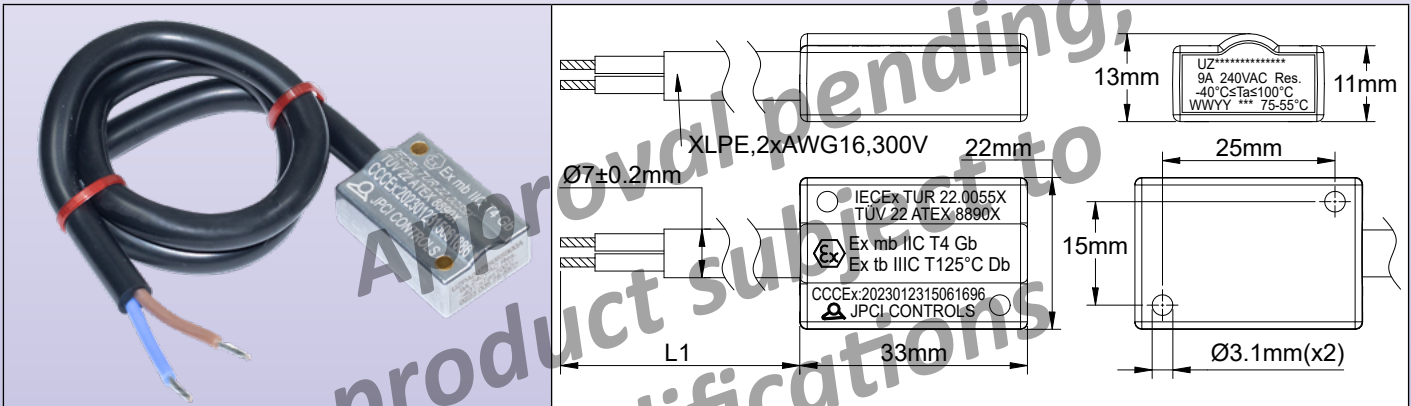
## Miniature temperature limiters, **wire or cable** electrical connections



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## Miniature current sensing temperature limiters up to 100°C (212°F), surface mounting, cable connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 250V	Min. and max. of calibration	Type
Cable	Fixed setting	Front, 2 holes dia. 3.1mm	Limiter	SPNC, open on rise 9A	50 to +100°C	<b>UZ</b>



### General rules for installation:

**Important note:** These limiters are intended to control temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as “Ex-mb” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification **T4** ;

**For dust hazardous areas,** this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature **125°C**. The thermostat electrical connections at the end of the wires must be made inside an EX-“e” enclosure.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8890 X ; IECEX: TUR 22.0055X ; CCCEX: 2023012315062866

**Housing:** aluminum, 33 × 13 × 22mm

**Temperature sensing element:** Current sensitive miniature bimetal disc

**Electrical connection:** XLPE insulated cable, 2 × AWG16 (≈2 × 1mm<sup>2</sup>), 300V, UL style 4411, withstanding -40+125°C (-40+257°F), Wire ends with crimped terminals.

**Ground:** By the enclosure body

**Adjustment:** These limiters are factory calibrated, with no adjustment possible by user. Calibration values are checked on it before encapsulation. They are checked with a pilot load at nearly 0 Amp.

**Mounting:** 2 holes dia 3.1mm 25mmx15mm distance

**Response time:** These limiters are not designed to respond quickly if the temperature rise rate is higher than 0.5°C per minute

**Contacts:** Snap action contact, SPNC, open by temperature rise

**Electrical rating:** 9A 240V resistive and 3A 240V inductive (10.000 cycles). Suitable for power control, remote control of relay coils or PLCs circuits.

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW.

**Current derating:** These devices are current sensitives and the real opening temperature must be decreased depending of the current in the circuit where they are used.

Amps	3A	5A	7A	9A
Derating	-2,5°C	-5°C	-10°C	-18°C

**For example:** a limiter calibrated at 100°C with cut a 90°C if the current is 7Amps

**Short circuit trip time:** If for any reason there is an overload in the circuit, the limiter will open automatically. The table hereunder provides the tripping in seconds, depending of the overload. Measurement made with a thermostat at 25°C (77°F) ambient temperature



	15A	20A	25A	30A	35A	40A
<b>Calibration at 50°C</b>						
<b>Calibration at 100°C</b>	100S	30S	11S	5S	2.5s	1S

**Classification:**

Gas: II 2G Ex mb IIC T4 Gb

Dust: II 2D Ex tb IIIC T125°C Db

### Main part numbers

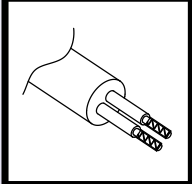
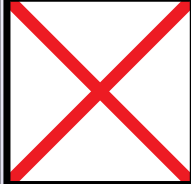
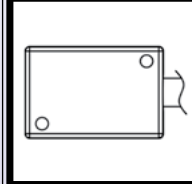
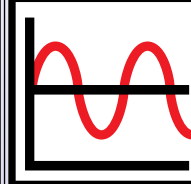
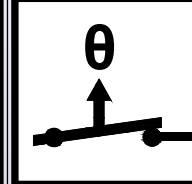
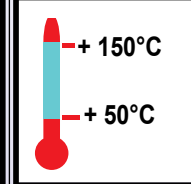
Open temperature +/-5°C, (+/-9°F)	Close temperature +/-5°C, (+/-9°F)	Part numbers with 1m long cable (L1)	Part numbers with 3m long cable (L1)	Part numbers with 6m long cable (L1)
50°C (122°F)	38°C (100°F)	UZV1005053810B1	UZV3005053810B1	UZV6005053810B1
70°C (158°F)	50°C (122°F)	UZV1007055010B1	UZV3007055010B1	UZV6007055010B1
80°C (176°F)	57°C (135°F)	UZV1008055710B1	UZV3008055710B1	UZV6008055710B1
100°C (212°F)	67°C (153°F)	UZV1010056710B1	UZV3010056710B1	UZV6010056710B1

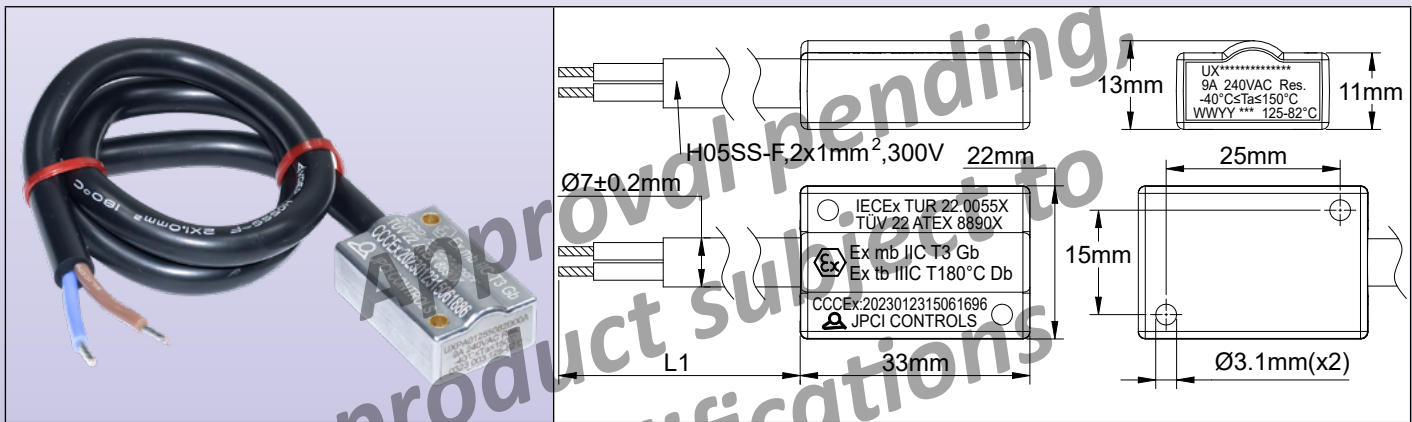
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## Current sensing miniature temperature limiters, calibration up to 150°C (302°F), surface mounting, cable connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 250V	Min. and max. of calibration	Type
Cable	Fixed setting	Front, 2 holes dia. 3.1mm	Limiter	SPNC, open on rise 9A	50 to +150°C	<b>UX</b>
						



### General rules for installation:

**Important note:** These limiters are intended to control temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as “Ex-mb” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T3 ;

**For dust hazardous areas,** this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature 180°C. The thermostat electrical connections at the end of the wires must be made inside an EX-“e” enclosure.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8890 X ; IECEx: TUR 22. 0055X ; CCCEX: 2023012315062866

**Housing:** aluminum, 33 × 13 × 22mm

**Temperature sensing element:** Current sensitive miniature bimetal disc

**Electrical connection:** H05SS-F silicone insulated cable, 2 × 1mm<sup>2</sup> (≈ 2 × AWG16), 300V, withstanding -60+180°C (-76+356°F). Wire ends with crimped terminals.

**Ground:** By the enclosure body

**Adjustment:** These limiters are factory calibrated, with no adjustment possible by user. Calibration values are checked on it before encapsulation. They are checked with a pilot load at nearly 0 Amp.

**Mounting:** 2 holes dia 3.1mm 25mmx15mm distance

**Response time:** These limiters are not designed to respond quickly if the temperature rise rate is higher than 0.5°C per minute

**Contacts:** Snap action contact, SPNC, open by temperature rise

**Electrical rating:** 9A 240V resistive and 3A 240V inductive (10.000 cycles). Suitable for power control, remote control of relay coils or PLCs circuits.

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW.

**Current derating:** These devices are current sensitives and the real opening temperature must be decreased depending of the current in the circuit where they are used.

Amps	3A	5A	7A	9A
Derating	-2,5°C	-5°C	-10°C	-18°C

**For example:** a limiter calibrated at 100°C with cut a 90°C if the current is 7Amps

**Short circuit trip time:** If for any reason there is an overload in the circuit, the limiter will open automatically. The table hereunder provides the tripping in seconds, depending of the overload. Measurement made with a thermostat at 25°C (77°F) ambient temperature



	15A	20A	25A	30A	35A	40A
Calibration at 50°C						
Calibration at 100°C	100S	30S	11S	5S	2.5s	1S
Calibration at 110°C	150S	40S	20S	8S	4S	2,5S
Calibration at 150°C	400S	150S	45 S	18S	9S	6S

**Classification:**

Gas: Ⓜ II 2G Ex mb IIC T3 Gb

Dust: Ⓜ II 2D Ex tb IIIC T180°C Db

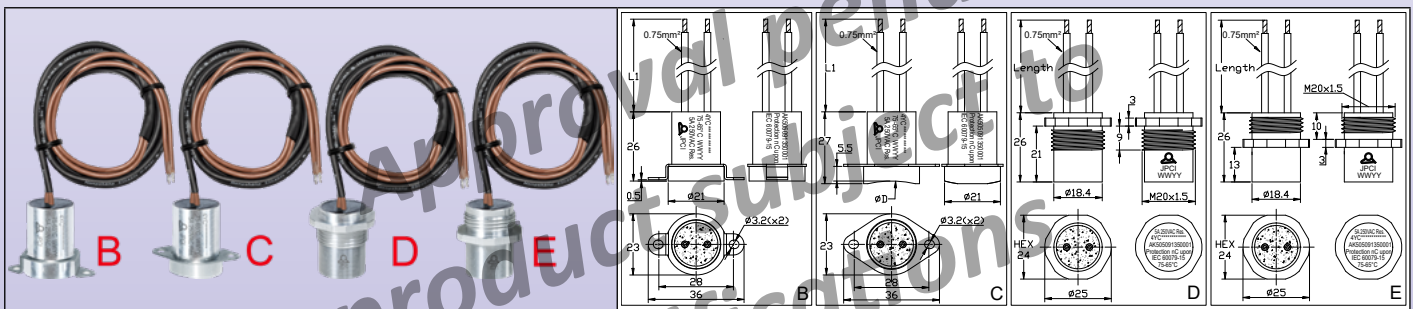
## Main part numbers

Open temperature +/-5°C, (+/-9°F)	Close temperature +/-5°C, (+/-9°F)	Part numbers with 1m long cable (L1)	Part numbers with 3m long cable (L1)	Part numbers with 6m long cable (L1)
105°C (221°F)	70°C (122°F)	UXV1010557010B1	UXV3010557010B1	UXV6010557010B1
110°C (230°F)	72°C (162°F)	UXV1011057210B1	UXV3011057210B1	UXV6011057210B1
130°C (266°F)	85°C (185°F)	UXV1013058510B1	UXV3013058510B1	UXV6013058510B1
140°C (284°F)	93°C (199°F)	UXV1014059310B1	UXV3014059310B1	UXV6014059310B1
150°C (302°F)	100°C (212°F)	UXV1015056990B1	UXV3015056990B1	UXV6015056990B1

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**Miniature temperature limiters, not current sensing, calibration up to 90°C (194°F), wires connection to use when R290 highly flammable refrigerant classed A3 upon ISO 817 may be present.**  
**This is not a Ex certified product**

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 240V	Min. and max. of calibration	Type
Wires	Fixed setting	On or through wall	Limiter	Open or close on temperature rise 9A	+5 to +90°C	<b>4YC</b>



**General rules for installation:**

**Important note:** Limiter designed to comply ONLY with IEC60079-0: 2011 (Explosive atmospheres, general requirements), § 26.5.1.2 and IEC 60079-15: 2010 (Explosive atmospheres, Equipment protection by type of protection “n”) § 19 ; 22.5.1 ; 22.5.2 ; 22.5.3.1 ; 22.5.3.2 and 22.5.3.3, when R32 mildly flammable refrigerant classed A2L upon Ashrae 34 and ISO 817, as found in air conditioning and heat pumps, may be present (See EN6.335-2-40)

**Approval:** TÜV Test report TÜV GC/70269203

**Housing:** IP65 aluminum, epoxy potted, many different dimensions, see drawings

**Temperature sensing element:** Miniature bimetal disc, **not current sensitive**

**Electrical connection:** Two PVC insulated wires, 0.75mm<sup>2</sup>, T105°C (221°F). H05VVF 300V/500V. Wire ends with crimped terminals.

**Ground:** By the enclosure body

**Adjustment:** These limiters are factory calibrated, with no adjustment possible by user. Calibration values are checked on it before encapsulation.

**Mounting:** Surface or through wall

**Response time:** These limiters are not designed to respond quickly if the temperature rise rate is higher than 1°C per minute.

**Contacts:** Single pole snap action contact, open or close by temperature rise

**Electrical rating:** 5A 240V resistive (100.000 cycles) and 5A 240V inductive (6.000 cycles). Suitable for power control, remote control of relay coils or PLCs circuits.

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW.

**Option:** On request rating up to 16A 240V with 1.5mm<sup>2</sup> wires (Need certification testing)

**Main part numbers**

Open temperature +/-5°C, (+/-9°F)	Close temperature +/-5°C, (+/-9°F)	Part numbers with 1m long wires (L1)	Part numbers with 3m long wires (L1)	Part numbers with 6m long wires (L1)
50°C (122°F)	40°C (100°F)	4YC1A10*OF5040D0	4YC1A30*OF5040D0	4YC1A60*OF5040D0
70°C (158°F)	60°C (122°F)	4YC1A10*OF7060D0	4YC1A30*OF7060D0	4YC1A60*OF7060D0
75°C (167°F)	65°C (149°F)	4YC1A10*OF7565D0	4YC1A30*OF7565D0	4YC1A60*OF7565D0
80°C (176°F)	70°C (158°F)	4YC1A10*OF8070D0	4YC1A30*OF8070D0	4YC1A60*OF8070D0
85°C (185°F)	75°C (167°F)	4YC1A10*OF8575D0	4YC1A30*OF8575D0	4YC1A60*OF8575D0
90°C (194°F)	80°C (176°F)	4YC1A10*OF9080D0	4YC1A30*OF9080D0	4YC1A60*OF9080D0

\*: Use the body letter (C, D, E, F) described in drawings. For body letter E the exact reference (E0, E8, EA, EB) depends of mounting diameter



# Miniature temperature limiters, not current sensing, calibration up to 100°C (212°F), cable or wires connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 240V	Min. and max. of calibration	Types
Cable or wires	Fixed setting	On or through wall	Limiter	Open or close on temperature rise 12A	5 to +100°C	4VA 4VB

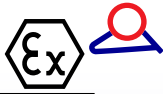
**4VA main types with cable**

**4VB main types with wires**

### General rules for installation:

**Important note:** These limiters are intended to monitor or control temperatures in gas or dust hazardous areas. For gas hazardous areas, this equipment is approved as "Ex-mb" and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T4;

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**For dust hazardous areas**, this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature **125°C**. The thermostat electrical connections at the end of the wires must be made inside an EX-“e” enclosure.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8891 X ; IECEx: TUR 22.0056X ; CCCEX: 2023012315062866

**Housing:** IP65 Anodized aluminum, epoxy potted, many different dimensions, see drawings

**Temperature sensing element:** Miniature bimetal disc, **not current sensitive**

**Electrical connection:**

- **4VA:** XLPE insulated cable, 2 × AWG16 (≈2 × 1.25mm<sup>2</sup>), 300V, UL style 4441, withstanding -40+125°C (-40+257°F),

- **4VB:** Two XLPE insulated wires, AWG16 (≈ 1.25mm<sup>2</sup>), 300V, withstanding -40+125°C (-40+257°F),

Wire ends with crimped terminals. Other lengths on request.

**Ground:** By the enclosure body

**Adjustment:** These limiters are factory calibrated, with no adjustment possible by user. Calibration values are checked on it before encapsulation.

**Mounting:** Surface or through wall

**Response time:** These limiters are not designed to respond quickly if the temperature rise rate is higher than 0.5°C per minute

**Contacts:** Single pole snap action contact, open or close by temperature rise

**Electrical rating:** 12A 240V resistive (30.000cycles) and 8A 240V inductive (6.000 cycles). Suitable for power control, remote control of relay coils or PLCs circuits.

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW.

**Classification:**

Gas: II 2G Ex mb IIC T4 Gb

Dust: II 2D Ex tb IIIC T125°C Db

## Main part numbers with cable output

Open temperature +/-5°C, (+/-9°F)	Close temperature +/-5°C, (+/-9°F)	Part numbers with 1m long cable (L1)	Part numbers with 3m long cable (L1)	Part numbers with 6m long cable (L1)
50°C (122°F)	40°C (100°F)	4VA1D00*0F5040D0	4VA1B30*0F5040D0	4VA1B60*0F5040D0
70°C (158°F)	60°C (122°F)	4VA1D00*0F7060D0	4VA1B30*0F7060D0	4VA1B60*0F7060D0
80°C (176°F)	70°C (135°F)	4VA1D00*0F8070D0	4VA1B30*0F8070D0	4VA1B60*0F8070D0
100°C (212°F)	90°C (153°F)	4VA1D00*0FA090D0	4VA1B30*0FA090D0	4VA1B60*0FA090D0

## Main part numbers with 2 wires output

Open temperature +/-5°C, (+/-9°F)	Close temperature +/-5°C, (+/-9°F)	Part numbers with 1m long cable (L1)	Part numbers with 3m long cable (L1)	Part numbers with 6m long cable (L1)
50°C (122°F)	40°C (100°F)	4VB1D00*0F5040D0	4VB1B30*0F5040D0	4VB1B60*0F5040D0
70°C (158°F)	60°C (122°F)	4VB1D00*0F7060D0	4VB1B30*0F7060D0	4VB1B60*0F7060D0
80°C (176°F)	70°C (135°F)	4VB1D00*0F8070D0	4VB1B30*0F8070D0	4VB1B60*0F8070D0
100°C (212°F)	90°C (153°F)	4VB1D00*0FA090D0	4VB1B30*0FA090D0	4VB1B60*0FA090D0

\*: Use the body letter (A, B, D, E) described in drawings. For body letter C the exact reference (C0, C8, CA, CB) depends of mounting diameter



# Miniature temperature limiters, not current sensing, calibration up to 150°C (302°F), cable or wires connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 240V	Min. and max. of calibration	Types
Cable or wires	Fixed setting	On or through wall	Limiter	Open or close on temperature rise, 12A	5 to +150°C	<b>4XA</b> <b>4XB</b>

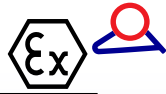
**4XA main types with cable**

**4XB main types with wires**

### General rules for installation:

**Important note:** These limiters are intended to monitor or control temperatures in gas or dust hazardous areas. For gas hazardous areas, this equipment is approved as “Ex-mb” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T3 ;

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**For dust hazardous areas**, this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature **185°C**. The thermostat electrical connections at the end of the wires must be made inside an EX-“e” enclosure.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8891 X ; IECEx: TUR 22.0056X ; CCCEX: 2023012315062866

**Housing:** IP65 Anodized aluminum, silicone potted, many different dimensions, see drawings

**Temperature sensing element:** Miniature bimetal disc, **not current sensitive**

**Electrical connection:**

- **4XA:** Silicone insulated cable, (H05SS), 2 × 1.5mm<sup>2</sup> (≈ 2 × AWG16), 300V, withstanding -60+180°C (-76+356°F).

- **4XB:** Two silicone insulated wires, 1.5mm<sup>2</sup> (≈ AWG16), 300V, withstanding -60+180°C (-76+356°F).

Wire ends with crimped terminals. Other lengths on request.

**Ground:** By the enclosure body

**Adjustment:** These limiters are factory calibrated, with no adjustment possible by user. Calibration values are checked on it before encapsulation.

**Mounting:** Surface or through wall

**Response time:** These limiters are not designed to respond quickly if the temperature rise rate is higher than 0.5°C per minute.

**Contacts:** Single pole snap action contact, open or close by temperature rise

**Electrical rating:** 12A 240V resistive (30.000cycles) and 8A 240V inductive (6.000 cycles). Suitable for power control, remote control of relay coils or PLCs circuits.

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW.

**Classification:**

Gas: II 2G Ex mb IIC T3 Gb

Dust: II 2D Ex tb IIIC T180°C Db

## Main part numbers with cable output

Open temperature +/-5°C, (+/-9°F)	Close temperature +/-5°C, (+/-9°F)	Part numbers with 1m long cable (L1)	Part numbers with 3m long cable (L1)	Part numbers with 6m long cable (L1)
105°C (221°F)	95°C (203°F)	4XA1B00*0FA595D0	4XA1B30*0FA595D0	4XA1B60*0FA595D0
110°C (230°F)	100°C (212°F)	4XA1B00*0FB0A0D0	4XA1B30*0FB0A0D0	4XA1B60*0FB0A0D0
130°C (266°F)	120°C (248°F)	4XA1B00*0FD0C0D0	4XA1B30*0FD0C0D0	4XA1B60*0FD0C0D0
140°C (284°F)	130°C (266°F)	4XA1B00*0FE0D0D0	4XA1B30*0FE0D0D0	4XA1B60*0FE0F0D0
150°C (302°F)	140°C (284°F)	4XA1B00*0FG0F0D0	4XA1B30*0FG0F0D0	4XA1B60*0FG0F0D0

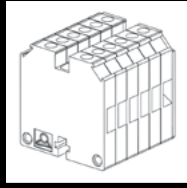
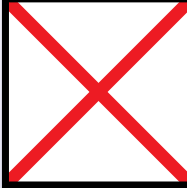
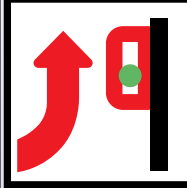
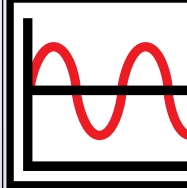
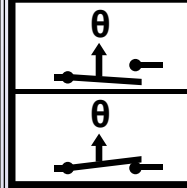
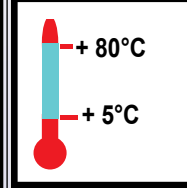
## Main part numbers with 2 wires output

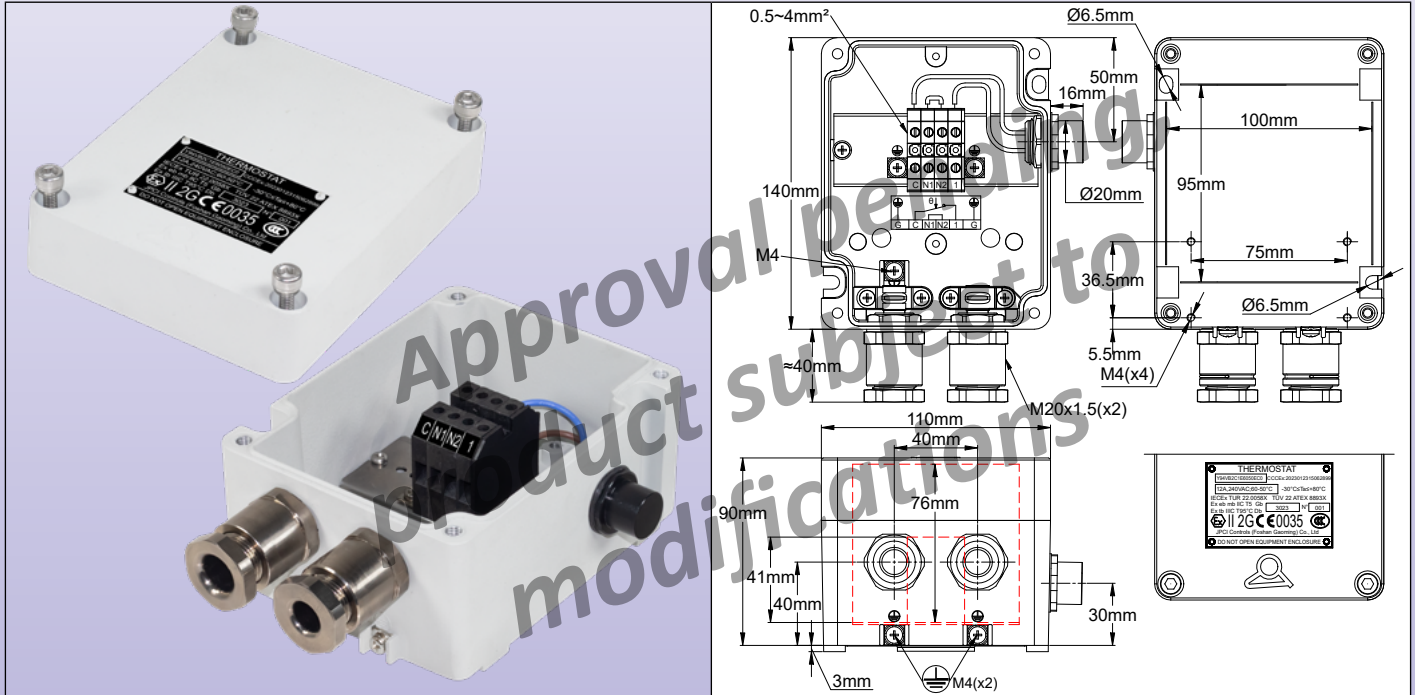
Open temperature +/-5°C, (+/-9°F)	Close temperature +/-5°C, (+/-9°F)	Part numbers with 1m long cable (L1)	Part numbers with 3m long cable (L1)	Part numbers with 6m long cable (L1)
105°C (221°F)	95°C (203°F)	4XB1B00*0FA595D0	4XB1B30*0FA595D0	4XB1B60*0FA595D0
110°C (230°F)	100°C (212°F)	4XB1B00*0FB0A0D0	4XB1B30*0FB0A0D0	4XB1B60*0FB0A0D0
130°C (266°F)	120°C (248°F)	4XB1B00*0FD0C0D0	4XB1B30*0FD0C0D0	4XB1B60*0FD0C0D0
140°C (284°F)	130°C (266°F)	4XB1B00*0FE0D0D0	4XB1B30*0FE0D0D0	4XB1B60*0FE0D0D0
150°C (302°F)	140°C (284°F)	4XB1B00*0FG0F0D0	4XB1B30*0FG0F0D0	4XB1B60*0FG0F0D0

\*: Use the body letter (A, B, D, E) described in drawings. For body letter C the exact reference (C0, C8, CA, CB) depends of mounting diameter



## Connection boxes, with ambient thermostat, fixed temperature setting

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 240V	Min. and max. of calibration	Type
Internal junction block	Fixed setting	Wall	Limiter	Open or close on temperature rise 12A	5 to +80°C	<b>Y94</b>
						



### General rules for installation:

**Important note:** These limiters are intended to monitor or control ambient temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as “Ex- mb eb” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T6 ;

**For dust hazardous areas,** this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature 80°C. The thermostat enclosure is approved “Ex-e”.

**Approvals:** These thermostats are certified:

- ATEX: TÜV 22 ATEX 8893X ;
- IECEX: IECEX TUR 22.0058X ;
- CCCEX: ??

**Housing:** aluminum, 140 × 110 × 90mm (Dimensions without cable glands), epoxy painting, RAL7035(thickness less than 0.2mm).

**Temperature sensing element:** Bimetal disc thermostat. Temperature sensing element is located outside the aluminum enclosure, on right side

**Electrical connection:** On built-in junction block, for conductors from 0.5mm<sup>2</sup> to 4mm<sup>2</sup>, screw terminals. 4 terminals for neutral, and line, including jumpers between input and output for neutral. There are also 2 ground terminals M4 inside and 2 outside the enclosure.

**Cable glands:** One or two M20 metal cable glands can be used for cable from 3.5 to 12mm. There is a cable locking saddle inside the enclosure, at each cable gland input. It allows the grounding of the braid if braided cables are used.

**Adjustment:** Fixed setting thermostat.

**Mounting:** Wall mounting, by 2 holes dia. 6.5 mm at 100mm × 95mm distance. The housing rear side also includes four M4 threaded holes 36.5 × 75mm distance for mounting metal brackets and feet providing offset wall mounting, pole or pipes mounting (see the accessories in the last part of this catalog)

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**Contacts:** SPNC open on temperature rise snap action contact. SPNO with close on temperature rise contact available on request.

**Electrical rating:** 12A 240V resistive (30.000 cycles) and 8A 240V inductive (6000 cycles). Suitable for power control, remote control of relay coils or PLCs circuits, and direct power switching. These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

**Gas classification:**

⊕ II 2G Ex mb eb IIC T6 Gb

**Dust classification :**

⊕ II 2D Ex tb IIIC T80°C Db

**Certificates :**

ATEX: TÜV 22 ATEX 8893X ;

IECEX: IECEX TUR 22.0058X ;

CCCEX: ??

## Main part numbers

Open temperature	Close temperature	Part numbers with 2 cable glands	Part numbers with 1 cable gland
10°C+/-3°C, (50°F+/-5.4°F)	4°C+/-3°C, (39.2°F+/-5.4°F)	Y94VB2C1E1004CC2*	Y94VB2C1E1004CC1*
20°C +/--5°C, (68°F+/-9°F)	10°C+/-5°C, (50°F+/-9°F)	Y94VB2C1E2010DC2	Y94VB2C1E2010DC1
30°C +/--5°C, (86°F +/--9°F)	20°C+/-5°C, (68°F+/-9°F)	Y94VB2C1E3020DC2	Y94VB2C1E3020DC1
40°C+/-5°C, (104°F +/--9°F)	30°C+/-5°C, (86°F+/-9°F)	Y94VB2C1E4030DC2	Y94VB2C1E4030DC1
50°C+/-5°C, (122°F +/--9°F)	40°C+/-5°C, (100°F+/-9°F)	Y94VB2C1E5040DC2	Y94VB2C1E5040DC1
70°C+/-5°C, (158°F+/-9°F)	60°C+/-5°C, (122°F+/-9°F)	Y94VB2C1E7060DC2	Y94VB2C1E7060DC1

\*: Part numbers used in antifreeze heating



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# Section 5

## Thermostats for incorporation, **wire and cable** electrical connections

Update 2023/12/27

Contact us

[www.ultimheat.com](http://www.ultimheat.com)

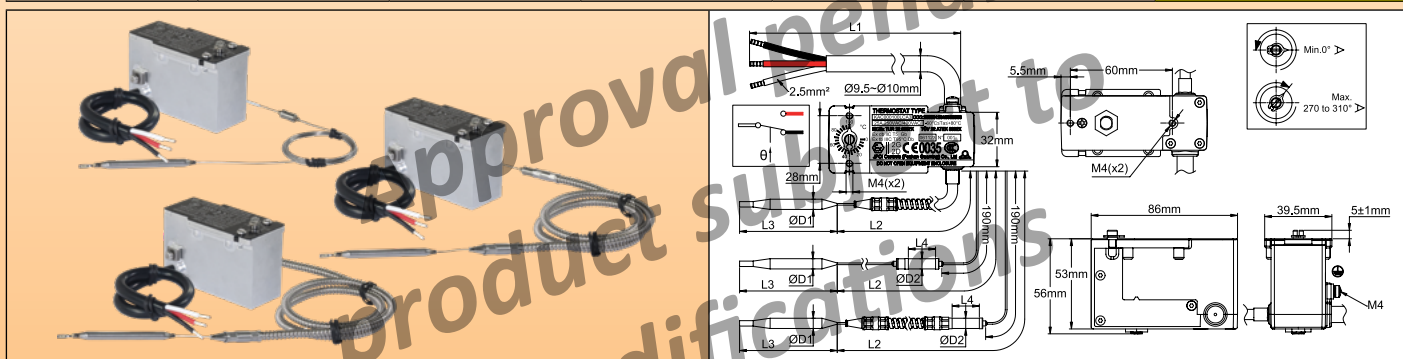
Cat4-2-5-1



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## Temperature control, front or rear mounting, cable connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating	T° range min and max adjustment limits	Types
Cable	Screwdriver	Front mounting with 2 M4 screw or Rear mounting with 2 M4 screws	Control	SPDT 16A, 400V; 25A, 250V	-50 to + 500°C	<b>KAA-3</b> <b>KAB-3</b> <b>KAC-3</b>



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas. **For gas hazardous areas**, this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5; **For dust hazardous areas**, this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C ( -60°C to +50°C at 25A). The thermostat body must be installed preferably inside an “Ex e” enclosure. The thermostat capillary exit must be performed by a cable gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard. Electrical connections at the end of the cable can be made inside an “Ex e” enclosure or outside the hazardous area. These models with screw driver adjustment and front mounting allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 60mm. **Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

- Housing:** Aluminum, 86 x 40 x 56mm (Dimensions without shaft and knob)
- Bulb and capillary:** Stainless steel. Standard capillary length 1500 mm. (Other lengths available with M.O.Q) Capillary minimum bending radius 5mm.
- Temperature sensing element:** Oil filled bulb and capillary.
- Electrical connection:** Silicone insulated cable H05SS-F, 3x 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.
- Ground terminals:** One M4 grounding terminals with saddle is located on the side.
- Adjustment:** With screwdriver
- Mounting:** Front bracket with 2 x M4 threads, 28 mm distance
- Contacts:** SPDT (Snap action contact)
- Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000

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# Explosion proof bulb and capillary thermostats for incorporation



These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas: II 2G Ex db IIC T5 Gb

Dust: II 2D Ex tb IIIC T95°C Db

## Main references with 1000mm cable length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBA3	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCA3	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDA3	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEA3	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFA3	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAA3	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

\*\* For a longer cable, replace the 15<sup>th</sup> character (A) by B for 2m, C for 3m, D for 4m a.s.o.

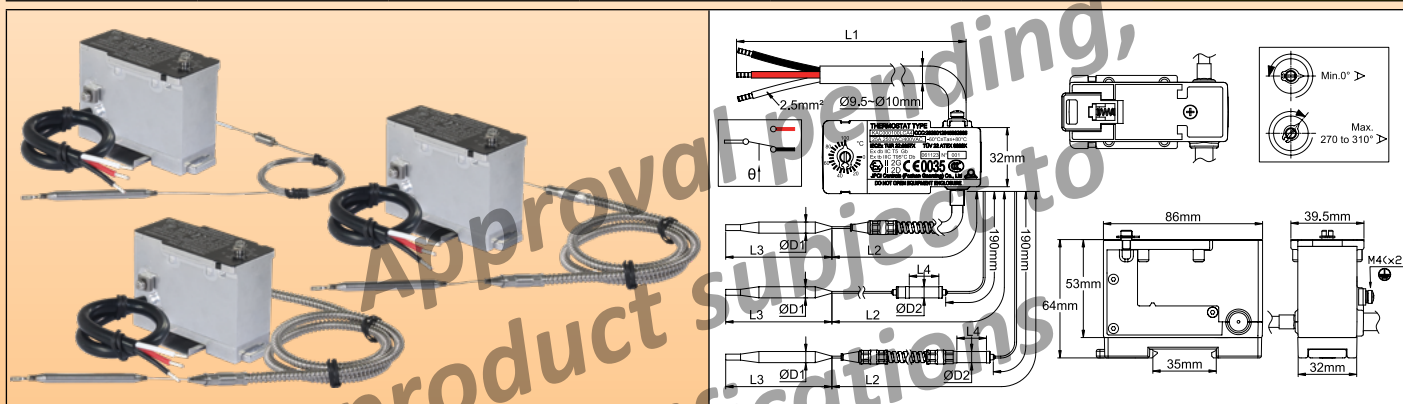
This cable output cannot be used with cable length more than 2m for ratings between 16A and 25A.

Go to the last section of this catalogue for knobs, dials, bezels and other accessories

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## Temperature control, Din Rail mounting, cable

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max adjustment limits	Types
Cable	Screwdriver	Backside DIN Rail	Control	SPDT 16A,400V; 25A,250V	-50 to + 500°C	<b>KAA-4</b> <b>KAB-4</b> <b>KAC-4</b>



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas. **For gas hazardous areas**, this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5; **For dust hazardous areas**, this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C ( -60°C to +50°C at 25A). The thermostat body must be installed preferably inside an “Ex e” enclosure. The thermostat capillary exit must be performed by a cable gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard. Electrical connections at the end of the cable can be made **inside an “Ex e” enclosure** or outside the hazardous area. These models with screw adjustment and mounting on rear side 35mm DIN rail allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 68mm above the DIN rail. **Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

- Housing:** Aluminum, 86 x 40 x 64mm (Dimensions without shaft and knob)
- Bulb and capillary:** Stainless steel. Capillary length 500 mm or 1500 mm. Capillary minimum bending radius 5mm.
- Temperature sensing element:** Oil filled bulb and capillary.
- Electrical connection:** Silicone insulated cable H05SS-F, 3x 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.
- Ground terminals:** One M4 grounding terminals with saddle is located on the side.
- Adjustment:** With screwdriver
- Mounting:** Backside, on symmetrical 35mm DIN rail
- Contacts:** SPDT (Snap action contact)
- Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA,



# Explosion proof bulb and capillary thermostats for incorporation



or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas: II 2G Ex db IIC T5 Gb

Dust: II 2D Ex tb IIIC T95°C Db

## Main references with 1000mm cable length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBA4	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCA4	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDA4	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEA4	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFA4	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAA4	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

\*\* For a longer cable, replace the 15<sup>th</sup> character (A) by B for 2m, C for 3m, D for 4m a.s.o.

This cable output cannot be used with cable length more than 2m for ratings between 16A and 25A.

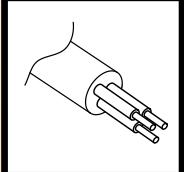
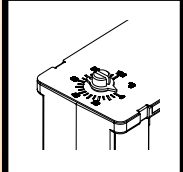
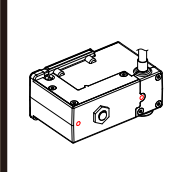
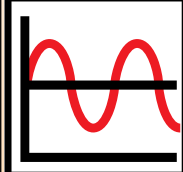
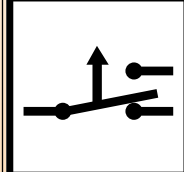
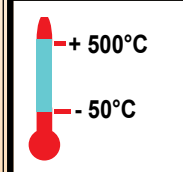
**Go to the last section of this catalogue for knobs, dials, bezels and other accessories**

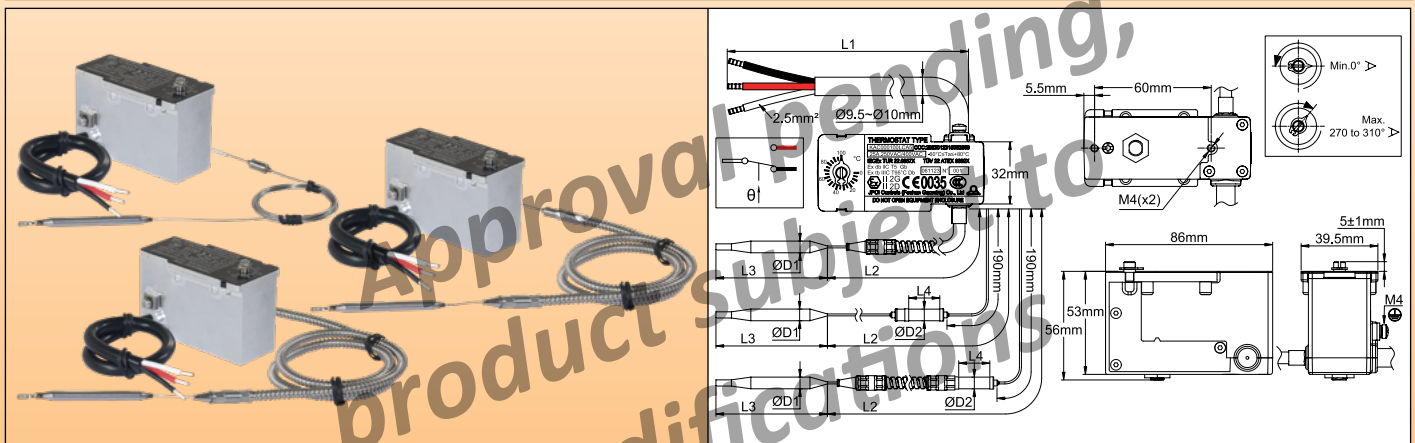
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## Temperature control, Rear mounting, cable connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max adjustment limits	Types
Cable	Screwdriver	Rear mounting with 2 M4 screws	Control	SPDT 16A,400V; 25A,250V	-50 to + 500°C	<b>KAA-5</b> <b>KAB-5</b> <b>KAC-5</b>
						



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5;

**For dust hazardous areas,** this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C ( -60°C to +50°C at 25A).

The thermostat body must be installed preferably inside an “Ex e” enclosure.

The thermostat capillary exit must be performed by a cable gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard.

Electrical connections at the end of the cable can be made inside an “Ex e” enclosure or outside the hazardous area. These models with screw driver adjustment and rear mounting with 2 M4 screws allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 60mm.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

- Housing:** Aluminum, 86 x 40 x 56mm (Dimensions without shaft and knob)
- Bulb and capillary:** Stainless steel. Standard capillary length 1500 mm. (Other lengths available with M.O.Q) Capillary minimum bending radius 5mm.
- Temperature sensing element:** Oil filled bulb and capillary.
- Electrical connection:** Silicone insulated cable H05SS-F, 3x 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.
- Ground terminals:** One M4 grounding terminals with saddle is located on the side.
- Adjustment:** With screwdriver
- Mounting:** Rear mounting with 2 M4 screws
- Contacts:** SPDT (Snap action contact)
- Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000



## Explosion proof bulb and capillary thermostats for incorporation



These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas: II 2G Ex db IIC T5 Gb

Dust: II 2D Ex tb IIIC T95°C Db

### Main references with 1000mm cable length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBA5	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCA5	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDA5	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEA5	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFA5	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAA5	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

\*\* For a longer cable, replace the 15<sup>th</sup> character (A) by B for 2m, C for 3m, D for 4m a.s.o.

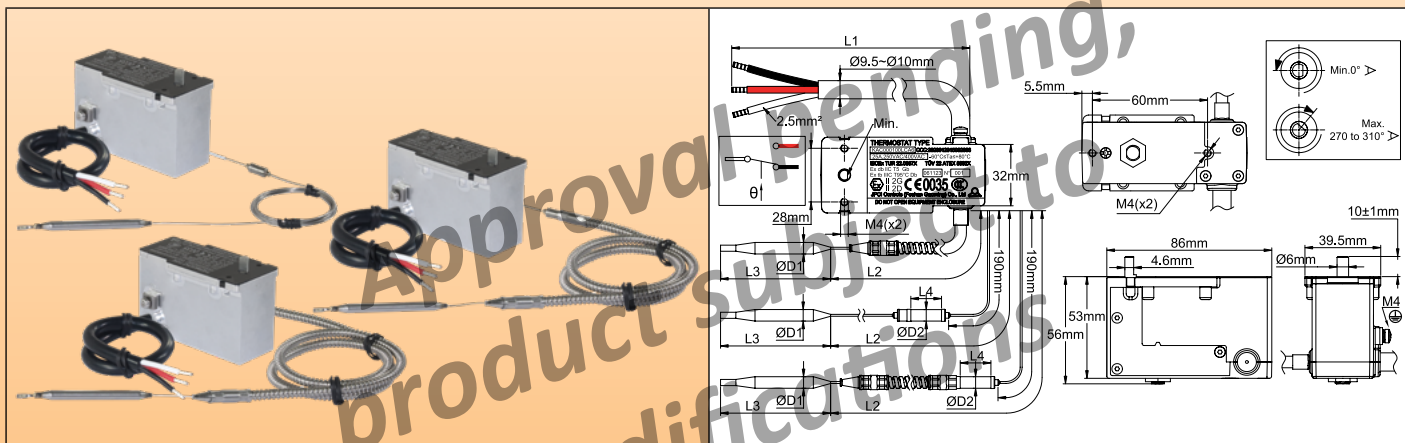
This cable output cannot be used with cable length more than 2m for ratings between 16A and 25A.

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## Temperature control, front mounting, cable connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max adjustment limits	Types
Cable	6mm diameter shaft for knob	Front, 2 M4 screw	Control	SPDT 16A,400V; 25A,250V	-50 to + 500°C	<b>KAA-6</b> <b>KAB-6</b> <b>KAC-6</b>



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas.  
**For gas hazardous areas,** this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5;  
**For dust hazardous areas,** this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C ( -60°C to +50°C at 25A).  
 The thermostat body must be installed preferably inside an “Ex e” enclosure.  
 The thermostat capillary exit must be performed by a cable gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard.  
 Electrical connections at the end of the cable can be made inside an “Ex e” enclosure or outside the hazardous area.  
 These models with screw driver adjustment and front mounting allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 66mm.  
**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

- Housing:** Aluminum, 86 x 40 x 56mm (Dimensions without shaft and knob)
- Bulb and capillary:** Stainless steel. Standard capillary length 1500 mm. (Other lengths available with M.O.Q) Capillary minimum bending radius 5mm.
- Temperature sensing element:** Oil filled bulb and capillary.
- Electrical connection:** Silicone insulated cable H05SS-F, 3x 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.
- Ground terminals:** One M4 grounding terminals with saddle is located on the side.
- Adjustment:** Dia. 6 mm shaft with 4.6 mm flat, length 10 mm.
- Mounting:** Front bracket with 2 x M4 threads, 28 mm distance
- Contacts:** SPDT (Snap action contact)
- Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000

Because of permanent improvement of our products, drawings, descriptions, features used on these data sheets are for guidance only and can be modified without prior advice



# Explosion proof bulb and capillary thermostats for incorporation



These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas: II 2G Ex db IIC T5 Gb

Dust: II 2D Ex tb IIIC T95°C Db

## Main references with 1000mm cable length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBA6	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCA6	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDA6	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEA6	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFA6	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAA6	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

\*\* For a longer cable, replace the 15<sup>th</sup> character (A) by B for 2m, C for 3m, D for 4m a.s.o.

This cable output cannot be used with cable length more than 2m for ratings between 16A and 25A.

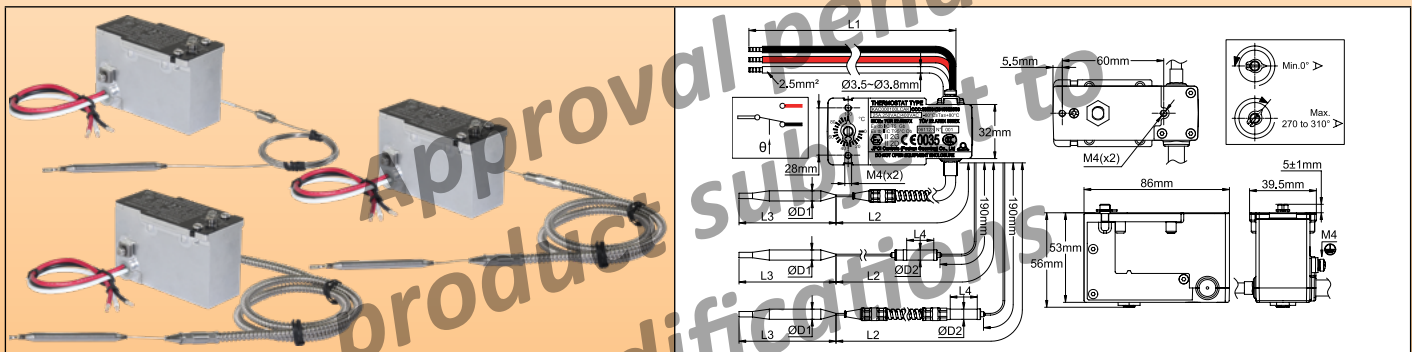
**Go to the last section of this catalogue for knobs, dials, bezels and other accessories**

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## Temperature control, front or rear mounting, wire connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating	T° range min and max adjustment limits	Types
Wire	Screwdriver	Front mounting with 2 M4 screw or Rear mounting with 2 M4 screws	Control	SPDT 16A,400V; 25A,250V	-50 to + 500°C	<b>KAA-K</b> <b>KAB-K</b> <b>KAC-K</b>



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas. **For gas hazardous areas**, this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5;

**For dust hazardous areas**, this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C ( -60°C to +50°C at 25A).

The thermostat body must be installed preferably inside an “Ex e” enclosure.

The thermostat capillary exit must be performed by a wire gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard.

Electrical connections at the end of the wire can be made inside an “Ex e” enclosure or outside the hazardous area. These models with screw driver adjustment and front mounting allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 60mm.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

**Housing:** Aluminum, 86 x 40 x 56mm (Dimensions without shaft and knob)

**Bulb and capillary:** Stainless steel. Standard capillary length 1500 mm. (Other lengths available with M.O.Q) Capillary minimum bending radius 5mm.

**Temperature sensing element:** Oil filled bulb and capillary.

**Electrical connection:** Silicone insulated wire H05S-K, 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.

**Ground terminals:** One M4 grounding terminals with saddle is located on the side.

**Adjustment:** With screwdriver

**Mounting:** Front bracket with 2 x M4 threads, 28 mm distance

**Contacts:** SPDT (Snap action contact)

**Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000



# Explosion proof bulb and capillary thermostats for incorporation



These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas:  $\text{Ex}$ II 2G Ex db IIC T5 Gb

Dust:  $\text{Ex}$ II 2D Ex tb IIIC T95°C Db

## Main references with 1000mm wire length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBAK	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCAK	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDAK	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEAK	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFAK	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAAK	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

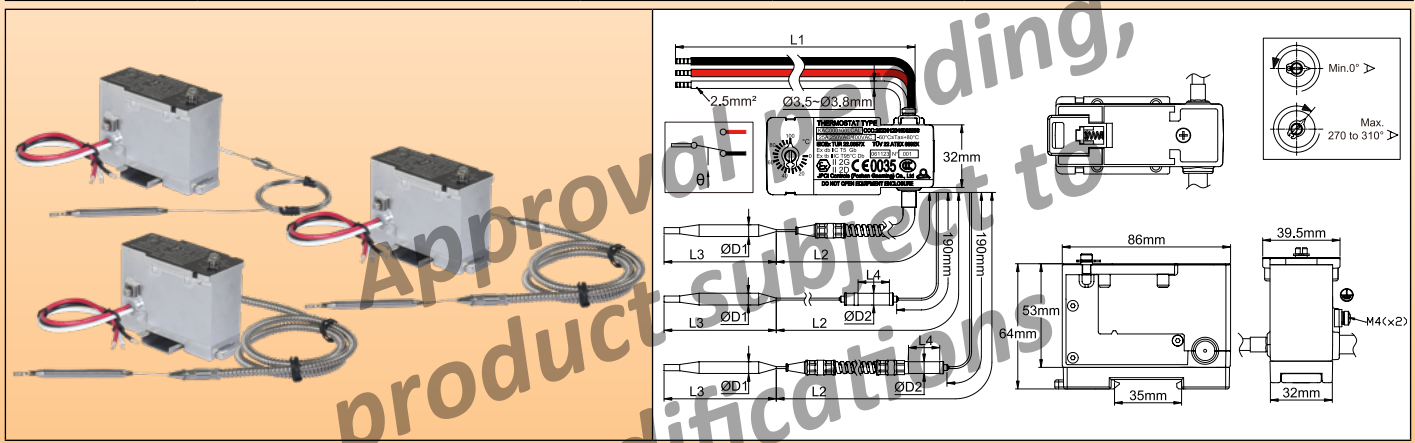
\*\* For a longer wire, replace the 15<sup>th</sup> character (A) by B for 2m, C for 3m, D for 4m a.s.o.

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## Temperature control, Din Rail mounting, wire

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max adjustment limits	Types
Wire	Screwdriver	Backside DIN Rail	Control	SPDT 16A,400V; 25A,250V	-50 to + 500°C	<b>KAA-L</b> <b>KAB-L</b> <b>KAC-L</b>



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas.  
**For gas hazardous areas**, this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5;  
**For dust hazardous areas**, this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C ( -60°C to +50°C at 25A).  
 The thermostat body must be installed preferably inside an “Ex e” enclosure.  
 The thermostat capillary exit must be performed by a wire gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard.  
 Electrical connections at the end of the wire can be made **inside an “Ex e” enclosure** or outside the hazardous area. These models with screw adjustment and mounting on rear side 35mm DIN rail allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 68mm above the DIN rail.  
**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

- Housing:** Aluminum, 86 x 40 x 64mm (Dimensions without shaft and knob)
- Bulb and capillary:** Stainless steel. Standard capillary length 1500 mm. (Other lengths available with M.O.Q) Capillary minimum bending radius 5mm.
- Temperature sensing element:** Oil filled bulb and capillary.
- Electrical connection:** Silicone insulated wire H05S-K, 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.
- Ground terminals:** One M4 grounding terminals with saddle is located on the side.
- Adjustment:** With screwdriver
- Mounting:** Backside, on symmetrical 35mm DIN rail
- Contacts:** SPDT (Snap action contact)
- Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000

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## Explosion proof bulb and capillary thermostats for incorporation



These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas:  $\text{Ex}$ II 2G Ex db IIC T5 Gb

Dust:  $\text{Ex}$ II 2D Ex tb IIIC T95°C Db

### Main references with 1000mm wire length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBAL	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCAL	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDAL	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEAL	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFAL	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAAL	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

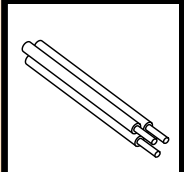
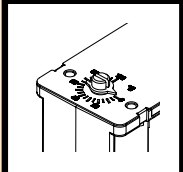
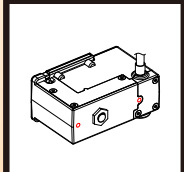
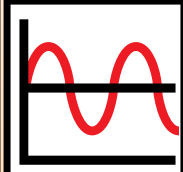
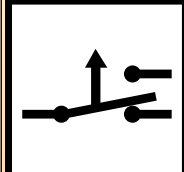
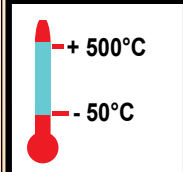
\*\* For a longer wire, replace the 15<sup>th</sup> character (A) by B for 2m, C for 3m, D for 4m a.s.o.

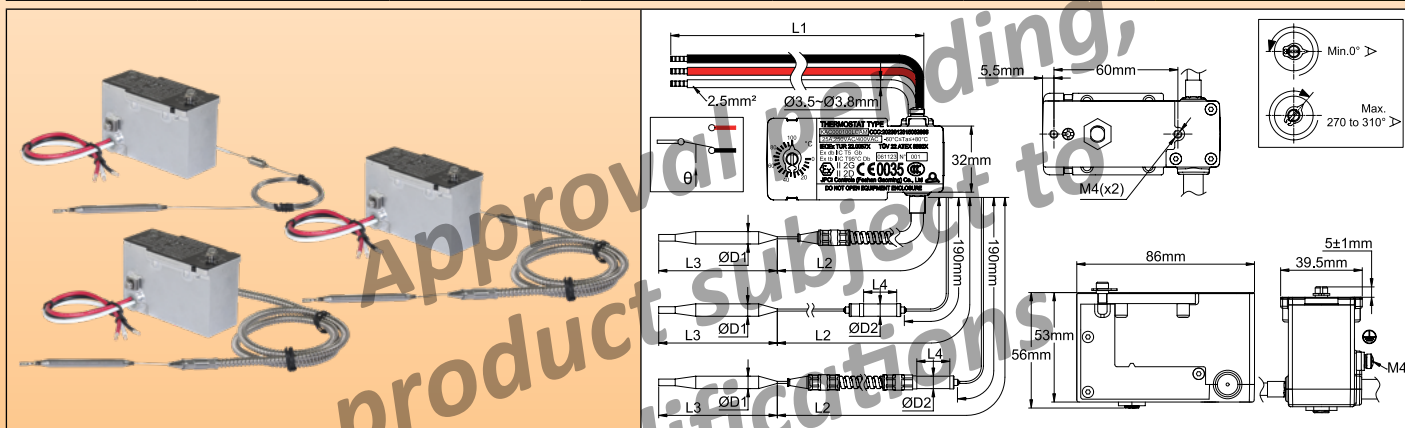
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## Temperature control, Rear mounting, wire connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max adjustment limits	Types
Wire	Screwdriver	Rear mounting with 2 M4 screws	Control	SPDT 16A,400V; 25A,250V	-50 to + 500°C	<b>KAA-M</b> <b>KAB-M</b> <b>KAC-M</b>
						



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas. **For gas hazardous areas**, this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5;

**For dust hazardous areas**, this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C (-60°C to +50°C at 25A).

The thermostat body must be installed preferably inside an “Ex e” enclosure.

The thermostat capillary exit must be performed by a wire gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard.

Electrical connections at the end of the wire can be made inside an “Ex e” enclosure or outside the hazardous area.

These models with screw driver adjustment and rear mounting with 2 M4 screws allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 60mm.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

**Housing:** Aluminum, 86 x 40 x 56mm (Dimensions without shaft and knob)

**Bulb and capillary:** Stainless steel. Standard capillary length 1500 mm. (Other lengths available with M.O.Q) Capillary minimum bending radius 5mm.

**Temperature sensing element:** Oil filled bulb and capillary.

**Electrical connection:** Silicone insulated wire H05S-K, 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.

**Ground terminals:** One M4 grounding terminals with saddle is located on the side.

**Adjustment:** With screwdriver

**Mounting:** Rear mounting with 2 M4 screws

**Contacts:** SPDT (Snap action contact)

**Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000



# Explosion proof bulb and capillary thermostats for incorporation



These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas: II 2G Ex db IIC T5 Gb

Dust: II 2D Ex tb IIIC T95°C Db

## Main references with 1000mm wire length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBAM	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCAM	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDAM	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEAM	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFAM	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAAM	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

\*\* For a longer wire, replace the 15th character (A) by B for 2m, C for 3m, D for 4m a.s.o.

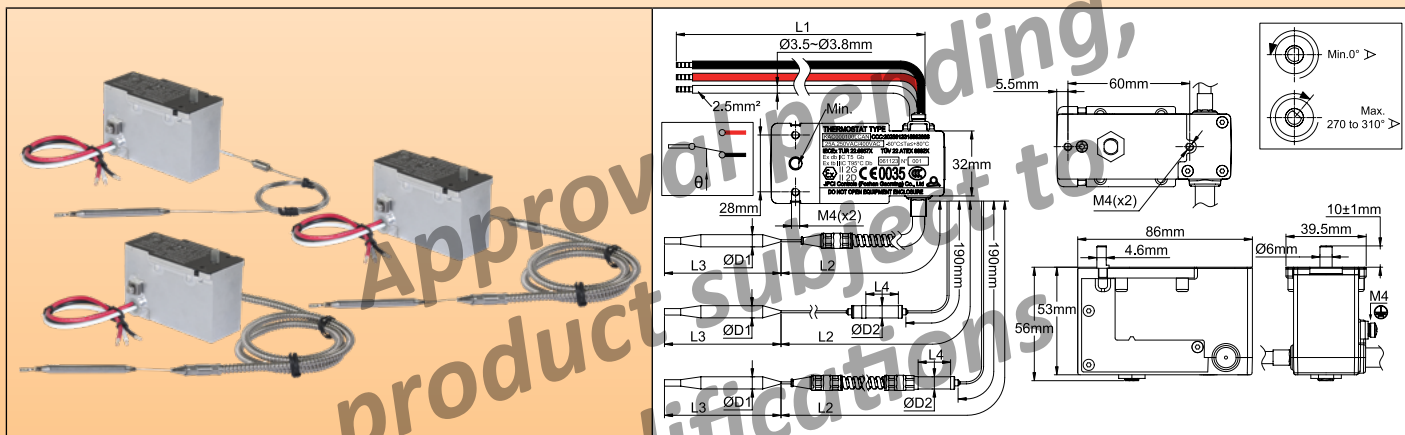
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## Temperature control, front mounting, wire connection

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max adjustment limits	Types
Wire	6mm diameter shaft for knob	Front, 2 M4 screw	Control	SPDT 16A,400V; 25A,250V	-50 to + 500°C	<b>KAA-N</b> <b>KAB-N</b> <b>KAC-N</b>



### General rules for installation:

**Important note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas. **For gas hazardous areas**, this equipment is approved as “Ex db” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5;

**For dust hazardous areas**, this equipment is approved as “Ex tb”, suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -60°C to +80°C ( -60°C to +50°C at 25A).

The thermostat body must be installed preferably inside an “Ex e” enclosure.

The thermostat capillary exit must be performed by a wire gland with gasket adapted to the diameter of the capillary and providing the level of protection required by the standard.

Electrical connections at the end of the wire can be made inside an “Ex e” enclosure or outside the hazardous area. These models with screw driver adjustment and front mounting allow incorporation inside most existing “Ex e” junction boxes in aluminum or polyester and inside a free height of 66mm.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8892 X; IECEx: IECEx TUR 22. 0057 X.

**Housing:** Aluminum, 86 x 40 x 56mm (Dimensions without shaft and knob)

**Bulb and capillary:** Stainless steel. Standard capillary length 1500 mm. (Other lengths available with M.O.Q) Capillary minimum bending radius 5mm.

**Temperature sensing element:** Oil filled bulb and capillary.

**Electrical connection:** Silicone insulated wire H05S-K, 2.5 mm<sup>2</sup>, T180°C, 450V, standard length 1000mm. Wire ends with crimped terminals. Other lengths on request.

**Ground terminals:** One M4 grounding terminals with saddle is located on the side.

**Adjustment:** Dia. 6 mm shaft with 4.6 mm flat, length 10 mm.

**Mounting:** Front bracket with 2 x M4 threads, 28 mm distance

**Contacts:** SPDT (Snap action contact)

**Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	16	100000
250VAC	25	100000
125VAC	25	100000
0-15VDC	25	100000
15-30VDC	2	100000



# Explosion proof bulb and capillary thermostats for incorporation



These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

### Options:

- Capillary sleeved with 6mm diameter stainless steel flexible tube
- Capillary with fitting for 6mm cable gland gasket, with or without capillary sleeving in stainless steel

**Mechanical life:** > 500.000 cycles

### Classification:

Gas: II 2G Ex db IIC T5 Gb

Dust: II 2D Ex tb IIIC T95°C Db

## Main references with 1000mm wire length (L1) \*\*

References	Temperature range	Capillary length (L2, mm)	Bulb diameter (D1, mm)	Capillary fitting diameter (D2, mm)	Bulb length (L3, mm)	Capillary fitting length (L4, mm)	Differential (°C)	Max temperature on bulb
KAA-20050VBAN	-20~50°C (-4~122°F) *	1500	6	6	138	16	3±2°C (5.5±3.6°F)	80°C (176°F)
KAA000100VCAN	0~100°C (32~212°F)	1500	6	6	96	16	5±3°C (9±5.4°F)	130°C (266°F)
KAA000200VDAN	0~200°C (32~392°F)	1500	6	6	71	16	5±3°C (9±5.4°F)	230°C (446°F)
KAA000300VEAN	0-300°C (32-570°F)	1500	4	6	80	16	10±2°C (18±3.6°F)	330°C (626°F)
KAA020400VFAN	20~400°C (68~752°F)	1500	4	6	95	16	20±6°C (36±11°F)	430°C (800°F)
KAA020500VAAN	20~500°C (68~932°F)	1500	4.7	6	120	16	20±6°C (36±11°F)	550°C (1000°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40° C (-40°F). However it is important to protect the bulb and /or the capillary against the risk of freezing if a temperature below -35° C (-31°F) can be reached in operation. Acceptable storage temperature: -50°C(-58°F).

\*\* For a longer wire, replace the 15th character (A) by B for 2m, C for 3m, D for 4m a.s.o.

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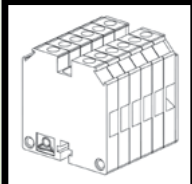
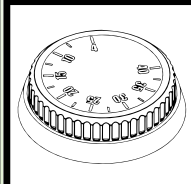

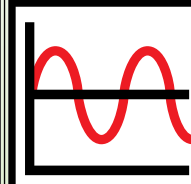
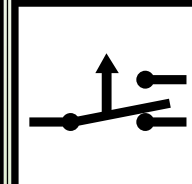
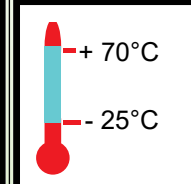
# **Section 6**

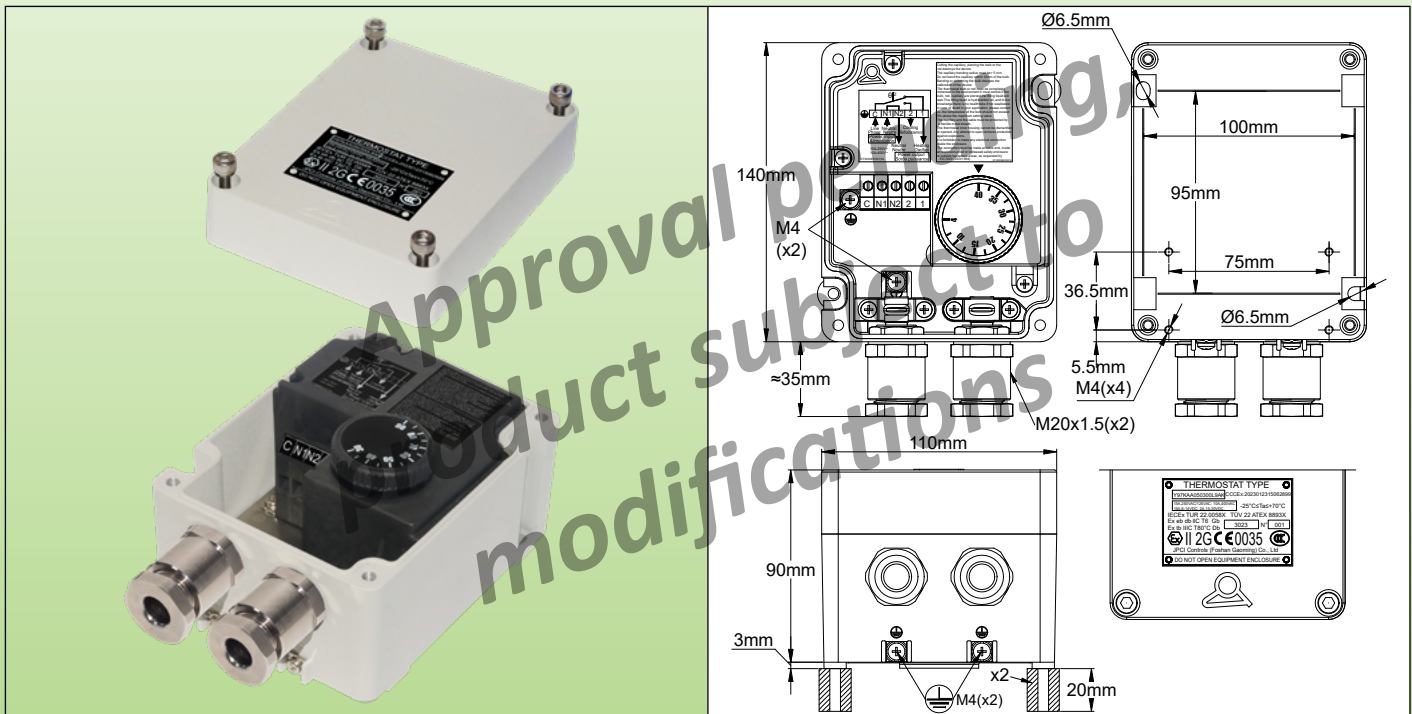
## **Thermostats and limiters, connection inside EX « e », IP65, aluminum housing with built-in connection block**



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## Ambient temperature control, printed knob adjustment

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max limits	Types
Internal junction block	Printed knob	Wall	Control	SPDT 15A	-25 to +70°C	<b>Y97KAA</b> <b>Y9GKAA</b>
						



### General Rules for Installation:

**Important Note:** These thermostats are intended to monitor or control temperatures in gas or dust hazardous areas. **For gas hazardous areas**, this equipment is approved as "Ex-eb db" and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T6 ;

**For dust hazardous areas**, this equipment is approved as "Ex-tb", suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -25°C to +80°C. The thermostat, box and terminal block assembly is an inseparable unit.

Ambient temperature on the enclosure must stay between -25 and +70° C but may also be limited by the maximum ambient temperature allowed on the temperature sensing element (See the parts numbers table). The temperature sensing element is located inside the aluminum enclosure, on the back side. Therefore, the response time is quite long. If this enclosure is mounted on a wall, we recommend to increase the gap between the backside and the wall to 20mm, to increase air circulation. Two extension washers of 20mm are supplied in standard for this use

**Approvals:** These thermostats are certified: ATEX: TÜV 22ATEX 8893 X ; IECEx: TUR 22.0058X ; CCCEX: ??????

**Housing:** aluminum, 140 × 110 × 90mm (Dimensions without cable glands), epoxy painting, RAL7035 (thickness less than 0.2mm).

**Temperature sensing element:** liquid expansion principle, oil filled. Temperature sensing element is located inside the aluminum enclosure, on backside

**Electrical connection:** On built-in junction block, for conductors of 0.5mm<sup>2</sup> to 4mm<sup>2</sup>, screw terminals. 5 terminals for neutral and line, including jumpers between input and output for neutral. There are also 2 ground terminals M4 inside and 2 outside the enclosure.

**Cable glands:** One or two M20 metal cable glands can be used for cable from 3.5 to 12mm. There is a cable locking saddle inside the enclosure, at each cable gland input. It allows the grounding of the braid if braided cables are used.

**Adjustment:** With knob printed in °C (°F on request). Adjustment is possible only after removing the cover, and when the electrical supply is powered off.

**Mounting:** Wall mounting, by 2 holes dia. 6.5 mm at 100mm × 95mm distance. The housing rear side also includes



## Thermostats and limiters, connection inside EX « e » aluminum housing with built-in connection block



four M4 threaded holes 36.5 × 75mm distance for mounting metal brackets and feet providing offset wall mounting, pole or pipes mounting (see the accessories in the last part of this catalog)

**Contacts:** SPDT (snap action contact)

**Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits, and direct power switching.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	10	100000
250VAC	15	100000
125VAC	15	100000
0-15VDC	15	100000
15-30VDC	2	100000

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

**Mechanical life:** > 500.000 cycles

**Options:** These enclosures can receive thermostats with setpoint screw driver adjustment (Type 97KAC) or with sealed fixed setting (Type 97KAF). See pages of thermostats without enclosure for more information.

**Gas classification:**

⊕ II 2G Ex eb db IIC T6 Gb

**Dust classification:**

⊕ II 2D Ex tb IIIC T80°C Db

**Certificates:**

ATEX: TÜV 22 ATEX 8893 X

IECEX: IECEX TUR 22.0058 X

### Main references

Part numbers with one M20 cable gland	Part numbers with two M20 cable gland	Temperature adjustment range	Differential	Max temperature on temperature measuring element located inside the enclosure*
Y9GKAA-35035S11K	Y97KAA-35035S11K	-35+35°C (-30+95°F) **	1.6±1°C (2.9±2°F)	60°C (140°F)
Y9GKAA-10040S21K	Y97KAA-10040S21K	-10+40°C (15-105°F)	1.5±1°C (2.7±2°F)	70°C (158°F)
Y9GKAA004040S41K	Y97KAA004040S41K	4-40°C (40-105°F)	1.±0.5°C (1.8±1°F)	50°C (122°F)
Y9GKAA000060S51K	Y97KAA000060S51K	0-60°C (32-140°F)	2.5±1°C (4.5±2°F)	75°C (167°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40°C. Acceptable minimum storage temperature: -50°C.

Maximum ambient temperature on these thermostats: +60°C

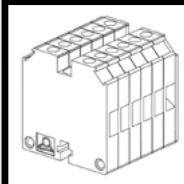
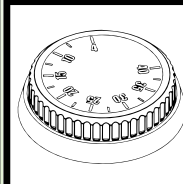
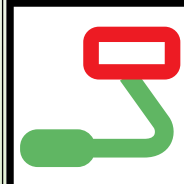
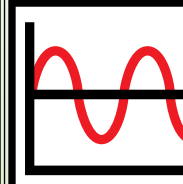
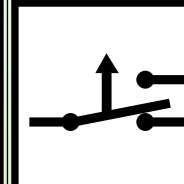
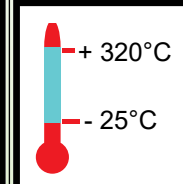
\*\* : The set point adjustment at low end is limited to -25°C

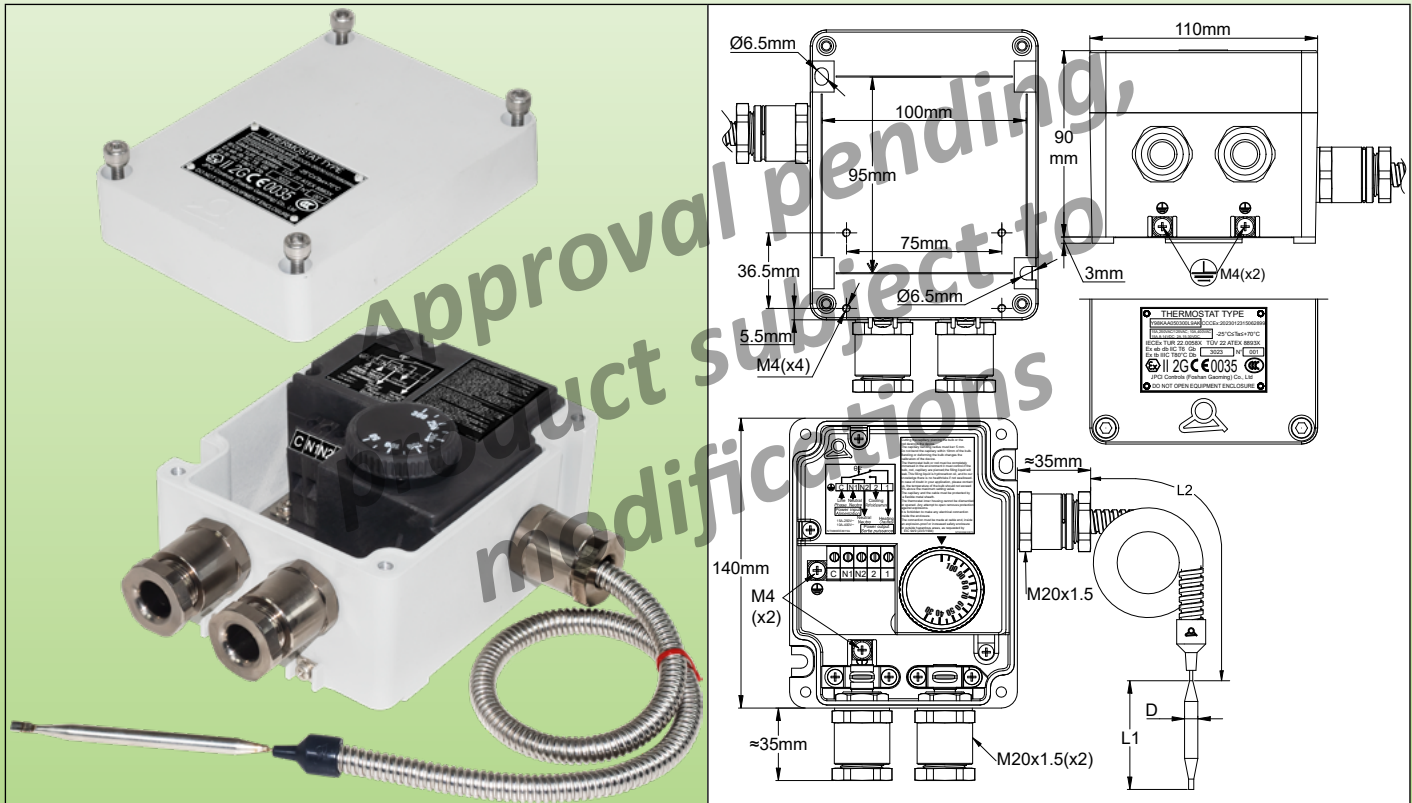
See to the last section of this catalogue for existing accessories

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## Bulb and capillary thermostat, printed knob adjustment

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max limits	Type
Internal junction block	Printed knob	Bulb and capillary	Control	SPDT 15A	-25 to +320°C	<b>Y98KAA</b>
						



### General Rules for Installation:

**Important Note:** These bulb and capillary thermostats are intended to monitor or control temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as "Ex-eb db" and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T6 ;

**For dust hazardous areas,** this equipment is approved as "Ex-tb", suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from -25°C to +80°C. The thermostat, box and terminal block assembly is an inseparable unit.

Ambient temperature on the enclosure must stay between -25 and +70° C but may also be limited by the maximum ambient temperature allowed on the temperature sensing element (See the parts numbers table).

**Approvals:** These thermostats are certified: ATEX: TÜV 22ATEX 8893 X ; IECEx: TUR 22.0058X ; CCCEx: ??????

**Housing:** aluminum, 140 × 110 × 90mm (Dimensions without cable glands), epoxy painting, RAL7035 (thickness less than 0.2mm).

**Temperature sensing element:** Oil filled bulb and capillary, liquid expansion principle. The capillary is protected by a flexible corrugated stainless-steel tube..

**Electrical connection:** On built-in junction block, for conductors of 0.5mm<sup>2</sup> to 4mm<sup>2</sup>, screw terminals. 5 terminals for neutral and line, including jumpers between input and output for neutral. There are also 2 ground terminals M4 inside and 2 outside the enclosure.

**Cable glands:** two M20 metal cable glands can be used for cable from 3.5 to 12mm. There is a cable locking saddle inside the enclosure, at each cable gland input. It allows the grounding of the braid if braided cables are used.

**Adjustment:** With knob printed in °C (°F on request). Adjustment is possible only after removing the cover, and when the electrical supply is powered off.



# Thermostats and limiters, connection inside EX « e » aluminum housing with built-in connection block



**Mounting:** Wall mounting, by 2 holes dia. 6.5 mm at 100mm × 95mm distance. The housing rear side also includes four M4 threaded holes 36.5 × 75mm distance for mounting metal brackets and feet providing offset wall mounting, pole or pipes mounting (see the accessories in the last part of this catalog)

**Contacts:** SPDT (snap action contact)

**Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits, and direct power switching.

Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	10	100000
250VAC	15	100000
125VAC	15	100000
0-15VDC	15	100000
15-30VDC	2	100000

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

**Mechanical life:** > 500.000 cycles

**Options:** These enclosures can receive thermostats with setpoint screw driver adjustment (Type 97KAC) or with sealed fixed setting (Type 97KAF). See pages of thermostats without enclosure for more information.

**Gas classification:**

⊕ II 2G Ex eb db IIC T6 Gb

**Dust classification:**

⊕ II 2D Ex tb IIIC T80°C Db

## Main references

Part numbers with one M20 cable gland	Part numbers with two M20 cable gland	Temperature range	Capillary length (L2, mm)	Bulb diameter (D, mm)	Bulb length (L3, mm)	Differential (°C)	Max temperature on bulb	Max temperature on enclosure
Y9HKAA-35035L11K	Y98KAA-35035L11K	-35+35°C (-30+95°F) **	1500	6	110	1.6±1°C (2.9±2°F)	60°C (140°F)	60°C (140°F)
Y9HKAA-10040L21K	Y98KAA-10040L21K	-10+40°C (15-105°F) *	1500	6	150	1.5±1°C (2.7±2°F)	70°C (158°F)	70°C (158°F)
Y9HKAA004040L41K	Y98KAA004040L41K	4-40°C (40-105°F) *	1500	8	120	1.±0.5°C (1.8±1°F)	50°C (122°F)	50°C (122°F)
Y9HKAA000060L51K	Y98KAA000060L51K	0-60°C (32-140°F)	1500	6	125	2.5±1°C (4.5±2°F)	75°C (167°F)	70°C (158°F)
Y9HKAA030090L61K	Y98KAA030090L61K	30-90°C (85-195°F)	1500	6	100	2.5±1°C (4.5±2°F)	120°C (250°F)	70°C (158°F)
Y9HKAA030110L71K	Y98KAA030110L71K	30-110°C (85-230°F)	1500	6	80	2.5±1°C (4.5±2°F)	140°C (284°F)	70°C (158°F)
Y9HKAA050200L81K	Y98KAA050200L81K	50-200°C (120-390°F)	1500	4	120	4±2°C (7±3.6°F)	230°C (446°F)	70°C (158°F)
Y9HKAA050300L91K	Y98KAA050300L91K	50-300°C (120-570°F)	1500	4	80	10±2°C (18±3.6°F)	330°C (626°F)	70°C (158°F)

\* The filling liquid of these thermostatic assemblies has a freezing temperature below -40°C. Acceptable minimum storage temperature: -50°C. Maximum ambient temperature on these thermostats: +60°C

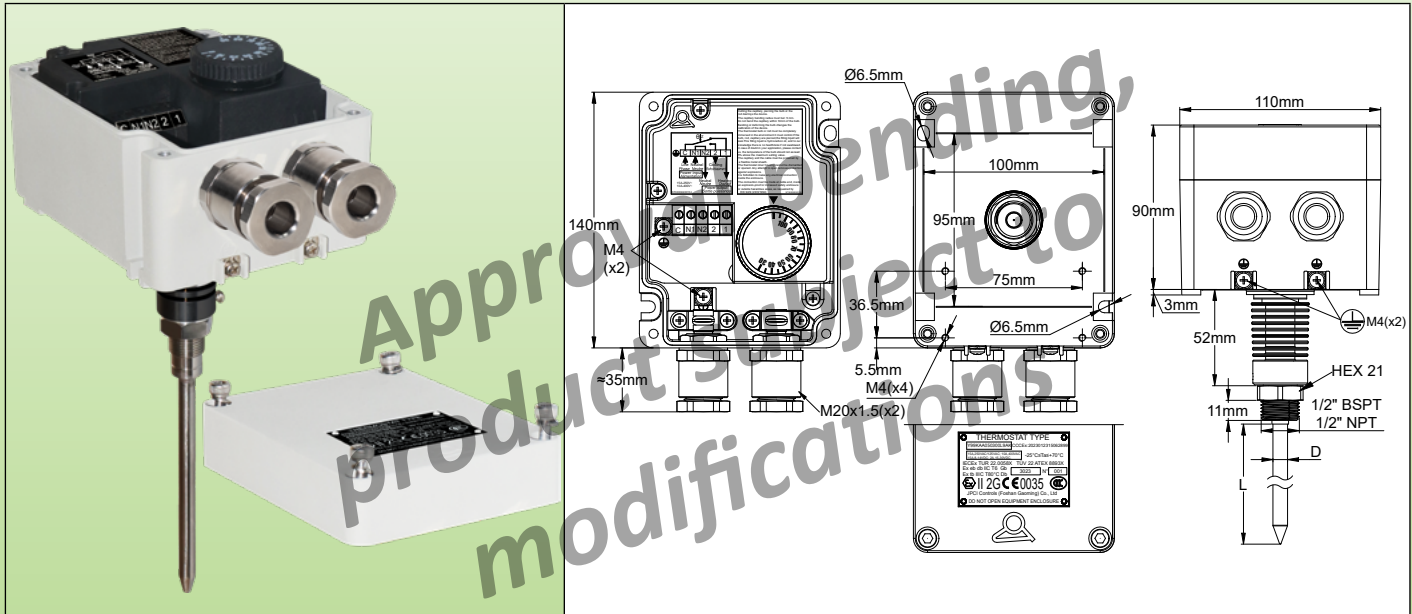
\*\* : The set point adjustment at low end is limited to -25°C

See to the last section of this catalogue for existing accessories

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## Rod thermostat, printed knob adjustment

Electrical connection	Set point adjustment	Mounting	Action	Contact Rating 230V	T° range min and max limits	Type
Internal junction block	Printed knob	Rod	Control	SPDT 15A	-25 to +320°C	<b>Y99KAA</b>



### General Rules for Installation:

**Important Note:** These **rod thermostats** are intended to monitor or control temperatures in gas or dust hazardous areas.

**For gas hazardous areas**, this equipment is approved as "Ex-eb db" and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification **T6** ;

**For dust hazardous areas**, this equipment is approved as "Ex-tb", suitable for use in zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), with ambient temperature limits on its body from **-25°C to +80°C**. The thermostat, box and terminal block assembly is an inseparable unit.

Ambient temperature on the enclosure must stay between -25 and +70 °C but may also be limited by the maximum ambient temperature allowed on the temperature sensing element (See the parts numbers table).

**Approvals:** These thermostats are certified: ATEX: TÜV 22ATEX 8893 X ; IECEx: TUR 22.0058X ; CCCEX: ??????

**Housing:** aluminum, 140 × 110 × 90mm (Dimensions without cable glands), epoxy painting, RAL7035 (thickness less than 0.2mm).

**Temperature sensing element:** Oil filled bulb, liquid expansion principle. The bulb is located inside a stainless-steel pocket with ½" BSPT or ½" NPT thread.

**Electrical connection:** On built-in junction block, for conductors of 0.5mm<sup>2</sup> to 4mm<sup>2</sup>, screw terminals. 5 terminals for neutral and line, including jumpers between input and output for neutral. There are also 2 ground terminals M4 inside and 2 outside the enclosure.

**Cable glands:** two M20 metal cable glands can be used for cable from 3.5 to 12mm. There is a cable locking saddle inside the enclosure, at each cable gland input. It allows the grounding of the braid if braided cables are used. One cable gland versions available on request.

**Adjustment:** With knob printed in °C (°F on request). Adjustment is possible only after removing the cover, and when the electrical supply is powered off.

**Mounting:** Wall mounting, by 2 holes dia. 6.5 mm at 100mm × 95mm distance. The housing rear side also includes four M4 threaded holes 36.5 × 75mm distance for mounting metal brackets and feet providing offset wall mounting, pole or pipes mounting (see the accessories in the last part of this catalog)

**Contacts:** SPDT (snap action contact)

**Electrical rating:** Suitable for power control, remote control of relay coils or PLCs circuits, and direct power switching.



# Thermostats and limiters, connection inside EX « e » aluminum housing with built-in connection block



Voltage	Max rating (A)	Switch Electrical life (cycles)
400VAC	10	100000
250VAC	15	100000
125VAC	15	100000
0-15VDC	15	100000
15-30VDC	2	100000

These devices use silver contacts or silver alloy contacts. Due to the possible oxidation of the contacts in time, we do not recommend the use of AC or DC low-voltage circuits (24V or less) if the switched intensity is less than 100mA, or the switched power less than 800mW. Contact us for those applications that require gold-plated contacts. The electrical ratings given are normalized resistive circuit values.

**Mechanical life:** > 500.000 cycles

**Options:** These enclosures can receive thermostats with setpoint screw driver adjustment (Type 97KAC) or with sealed fixed setting (Type 97KAF). See pages of thermostats without enclosure for more information.

**Gas classification:**

⊕ II 2G Ex eb db IIC T6 Gb

**Dust classification:**

⊕ II 2D Ex tb IIIC T80°C Db

## Main references with ½" BSPT thread

Part numbers with one M20 cable gland	Part numbers with two M20 cable gland	Temperature range	Rod length (L, mm)	Rod diameter (D, mm)	Differential (°C)	Max temperature on the rod	Max temperature on enclosure
Y9IKAA-35035211K	Y99KAA-35035211K	-35+35°C (-30+95°F) **	230	8	1.6±1°C (2.9±2°F)	60°C (140°F)	60°C (140°F)
Y9IKAA-10040221K	Y99KAA-10040221K	-10+40°C (15-105°F) *	230	8	1.5±1°C (2.7±2°F)	70°C (158°F)	70°C (158°F)
Y9IKAA004040241K	Y99KAA004040241K	4-40°C (40-105°F) *	230	10	1.±0.5°C (1.8±1°F)	50°C (122°F)	50°C (122°F)
Y9IKAA000060251K	Y99KAA000060251K	0-60°C (32-140°F)	230	8	2.5±1°C (4.5±2°F)	75°C (167°F)	70°C (158°F)
Y9IKAA030090261K	Y99KAA030090261K	30-90°C (85-195°F)	230	8	2.5±1°C (4.5±2°F)	120°C (250°F)	70°C (158°F)
Y9IKAA030110271K	Y99KAA030110271K	30-110°C (85-230°F)	230	8	2.5±1°C (4.5±2°F)	140°C (284°F)	70°C (158°F)
Y9IKAA050200381K	Y99KAA050200381K	50-200°C (120-390°F)	300	6	4±2°C (7±3.6°F)	230°C (446°F)	70°C (158°F)
Y9IKAA050300391K	Y99KAA050300391K	50-300°C (120-570°F)	300	6	10±2°C (18±3.6°F)	330°C (626°F)	70°C (158°F)

\*: The filling liquid of these thermostatic assemblies has a freezing temperature below -40°C. Acceptable minimum storage temperature: -50°C. Maximum ambient temperature on these thermostats: +60°C.

\*\* : The set point adjustment at low end is limited to -25°C

\*\*\* : For ½" NPT thread, replace the 13rd character (2 or 3) by B and C in the reference.

See to the last section of this catalogue for existing accessories.

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# **Section 7**

## **Aluminum connection boxes**

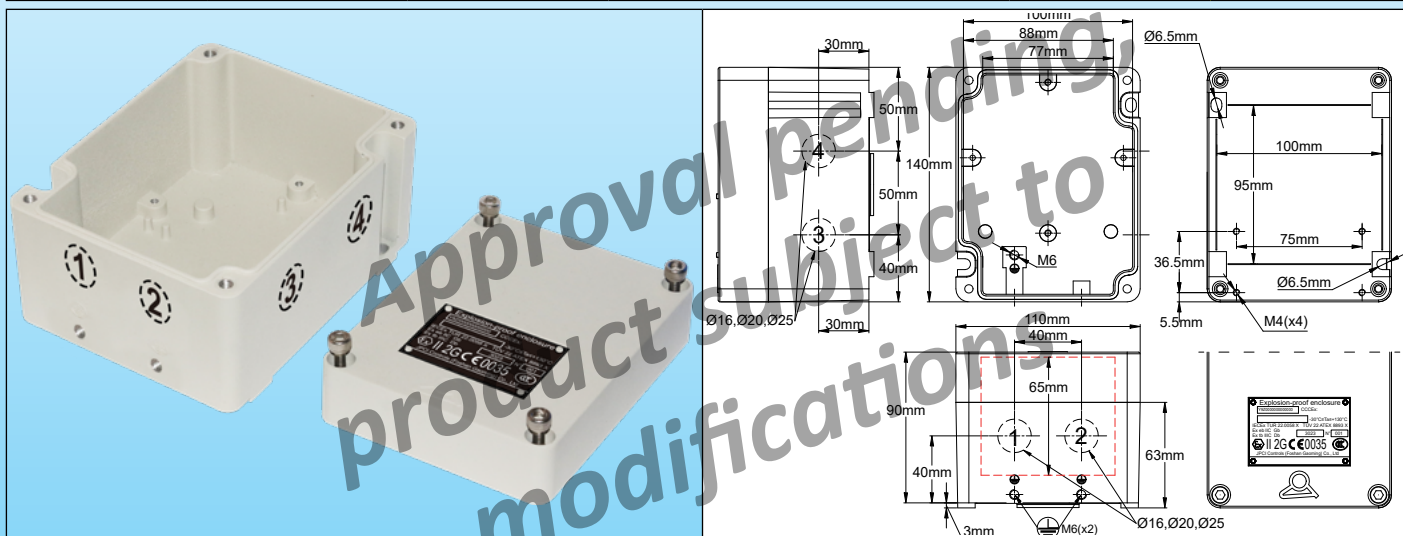
### **EX « e », IP65.**



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## Empty connection boxes, with or without cable glands holes

Electrical connection	Cable glands holes	Holes diameters	Internal Ground terminals	External Ground terminals	Min and max ambient temperature	Type
Without Internal junction block	0 to 4	16, 20, 25	1 × M6	2 × M6	-30 to +125°C	<b>Y9Z</b>



### General rules for installation:

**Important note:** These connection boxes are intended to monitor or control ambient temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as “Ex-eb” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification **T4** ;

**For dust hazardous areas,** this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature **125°C**.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8894 X ; IECEx: IECEx TUR 22. 0059 X ; CCEx: ??????

**Housing:** Aluminum, 140 × 110 × 90mm, epoxy painting, RAL7032 (thickness less than 0.2mm).

There are 1 ground terminal M6 inside and 2 ground terminals M6 outside the enclosure.

**Holes for cable glands:** These boxes can be shipped with one to four holes for M1, M20, M25 cable glands, allowing assembly of cable glands by the customer. (see drawing)

**Mounting:** Wall mounting, by 2 holes dia. 6.5mm at 100mm × 95mm distance. The housing rear side also includes four M4 threaded holes 36.5 × 75mm distance for mounting metal brackets and feet providing offset wall mounting, pole or pipes mounting (see the accessories in the last part of this catalog)

**Gas classification:**

⊕ II 2G Ex eb IIC T4 Gb

**Dust classification:**

⊕ II 2D Ex tb IIIC T125°C Db

### Main references (dia. 20mm holes\*)

Part Number	No cable gland hole	Cable gland hole # 1 position	Cable gland hole # 2 position	Cable gland hole # 3 position	Cable gland hole # 4 position
Y9Z0000000	x				
Y9Z2000000		A			
Y9Z2020000		A	B		
Y9Z2020200		A	B	C	
Y9Z2020202		A	B	C	D

Other cable glands positions are possible. Part numbers on request.

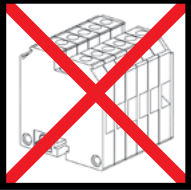
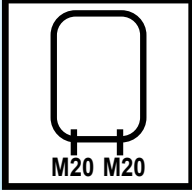
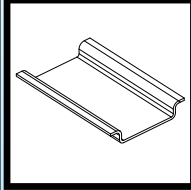
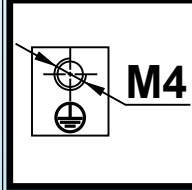
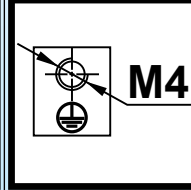
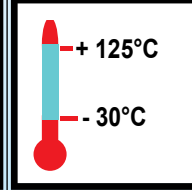
\* For drills of 16mm, replace 20 by 16 in the reference. For drills of 25mm, replace 20 by 25 in the reference

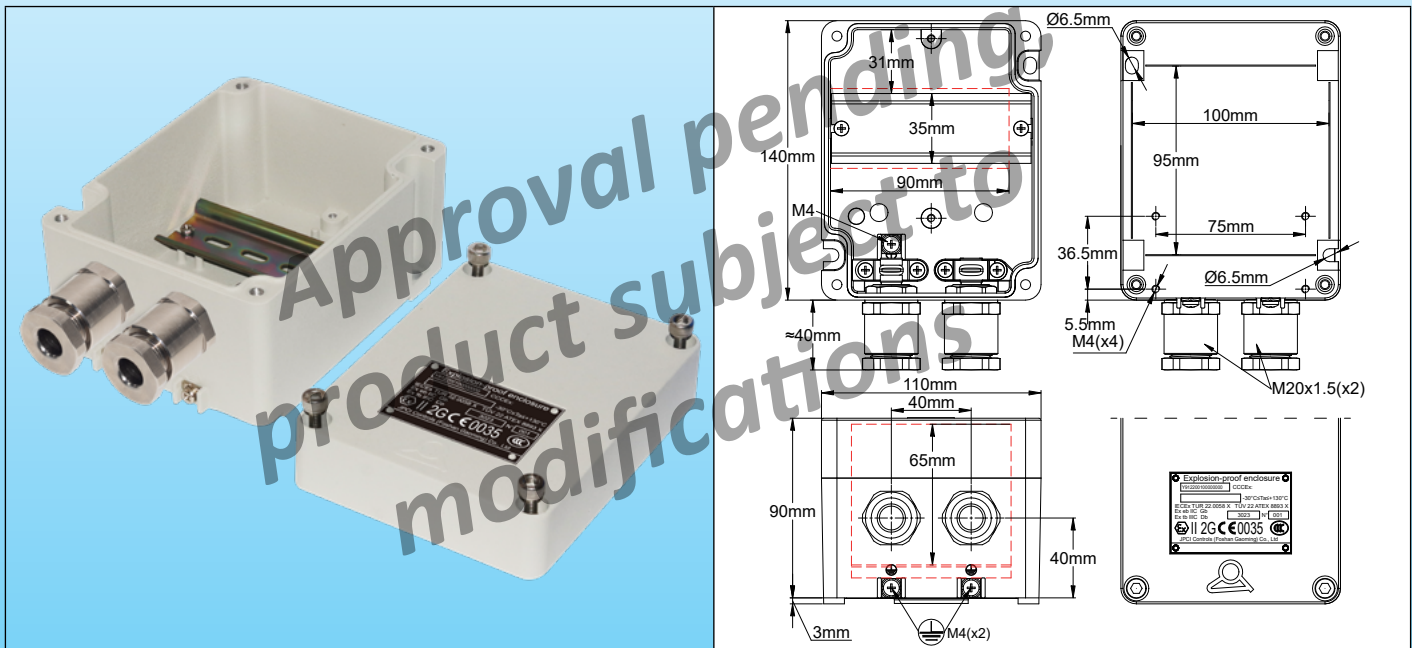
See to the last section of this catalogue for existing accessories

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## Connection boxes with M20 cable glands and 35mm DIN Rail

Electrical connection	Cable glands	Mounting accessories	Internal Ground terminals	External Ground terminals	Min and max ambient temperature	Type
Without Internal junction block	2 × M20	DIN rail 35mm	1 × M4	2 × M4	-30 to +125°C	<b>Y91</b>
						



### General rules for installation:

**Important note:** These connection boxes are intended to monitor or control ambient temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as “Ex-eb” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5 ;

**For dust hazardous areas,** this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature 95°C.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8894 X ; IECEx: IECEx TUR 22. 0059 X ; CCCEX: ???????

**Housing:** Aluminum, 140 × 110 × 90mm, epoxy painting, RAL7032 (thickness less than 0.2mm).

There are 1 ground terminal M4 inside and 2 ground terminals M4 outside the enclosure.

**Cable glands:** These boxes can be shipped with one to four M20 cable glands.

**Accessory:** One 35mm DIN Rail with 90mm usable length. (Other mounting boards are available)

**Mounting:** Wall mounting, by 2 holes dia. 6.5mm at 100mm × 95mm distance. The housing rear side also includes four M4 threaded holes 36.5 × 75mm distance for mounting metal brackets and feet providing offset wall mounting, pole or pipes mounting (see the accessories in the last part of this catalog)

**Gas classification:**

Ex II 2G Ex eb IIC T5 Gb

**Dust classification:**

Ex II 2D Ex tb IIIC T95°C Db

### Main references

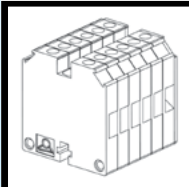
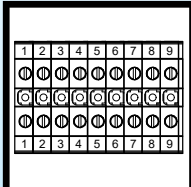
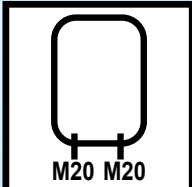
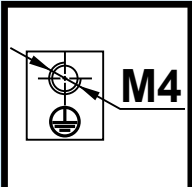
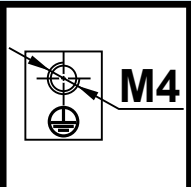
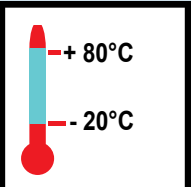
Part Number	M20 Cable gland # 1 position	M20 Cable gland # 2 position
Y91200000001	A	
Y91202000001	A	B

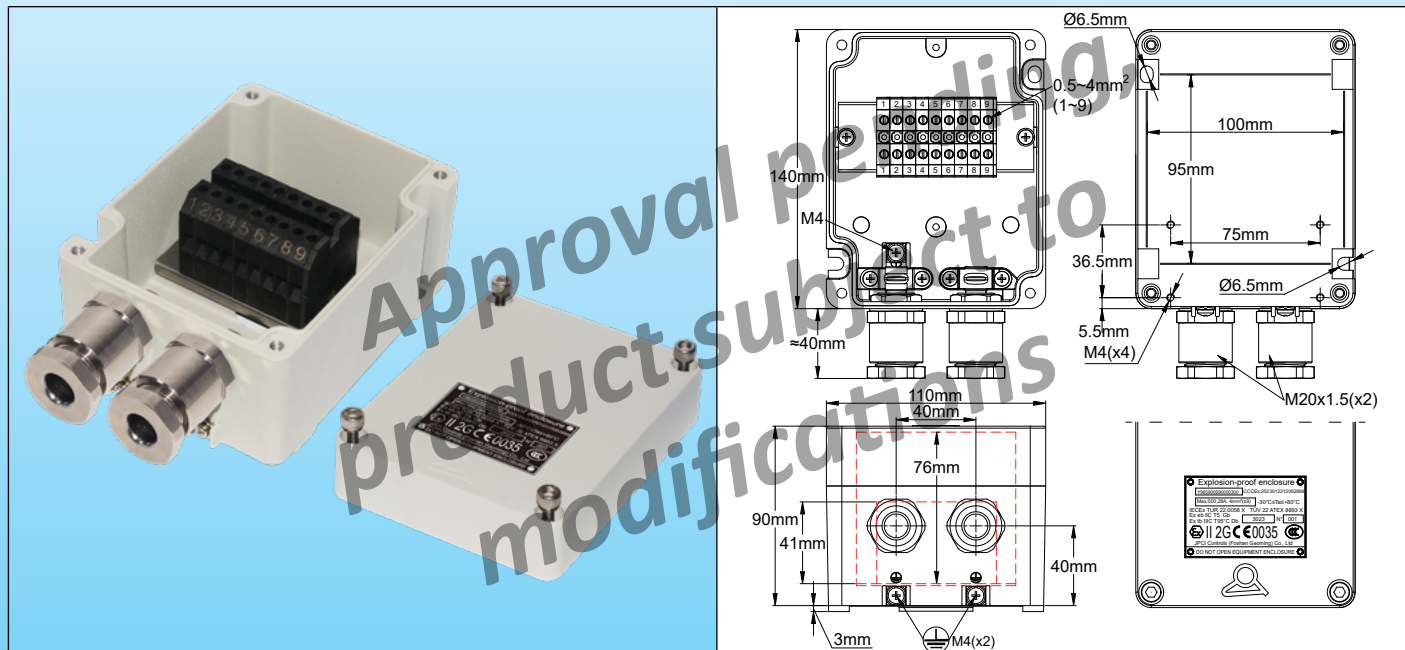
Other cable glands positions are possible. Part numbers on request.

See to the last section of this catalogue for existing accessories



## Connection boxes with M20 cable glands and junction block

Electrical connection	Quantity of ways in the connection block	Cable glands	Internal Ground terminals	External Ground terminals	Min and max ambient temperature	Type
On internal junction block	1~ 9	2 × M20	1 × M4	2 × M4	-20 to +80°C	<b>Y96</b>
						



### General rules for installation:

**Important note:** These connection boxes are intended to monitor or control ambient temperatures in gas or dust hazardous areas.

**For gas hazardous areas,** this equipment is approved as “Ex-eb” and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification T5 ;

**For dust hazardous areas,** this equipment is approved as “Ex-tb”, suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature 95°C.

**Approvals:** These thermostats are certified: ATEX: TÜV 22 ATEX 8894 X ; IECEx: IECEx TUR 22. 0059 X ; CCCEX: ??????

**Housing:** Aluminum, 140 × 110 × 90mm, epoxy painting, RAL7032 (thickness less than 0.2mm).

There are 1 ground terminal M4 inside and 2 ground terminals M4 outside the enclosure.

**Cable glands:** These boxes can be shipped with one to four M20 cable glands.

**Accessory:** One junction block for conductors of 0.5mm<sup>2</sup> to 4mm<sup>2</sup>

**Mounting:** Wall mounting, by 2 holes dia. 6.5mm at 100mm × 95mm distance. The housing rear side also includes four M4 threaded holes 36.5 × 75mm distance for mounting metal brackets and feet providing offset wall mounting, pole or pipes mounting (see the accessories in the last part of this catalog)

**Gas classification:**

⊕ II 2G Ex eb IIC T5 Gb

**Dust classification:**

⊕ II 2D Ex tb IIIC T95°C Db

### Main references with 9 ways junction block\*

Part Number	M20 Cable gland # 1 position	M20 Cable gland # 2 position
Y96J9000S900001	A	
Y96J9000S900003	A	B

Other cable glands positions are possible. Part numbers on request.

\* For a lower quantity of ways in the junction block, replace 9 (in S9) by the requested quantity

See to the last section of this catalogue for existing accessories

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# Pressure screw-clamping IP67 waterproof PA66 termination caps (End seals) for closing the free end of oblong or round heating cables.

Materials	Minimum tear strength	Heating cables types	Assembly	 ATEX IECEX CCCEX	Type
PA66, stainless steel, Silicone	>25 DaN	Oblongs or round	Locked on the cable		<b>6YTEW</b>



Before assembly on cable

After cable insertion tightening and assembly on pipe

<p>6YTEW1</p> <p>Dimensions: 24.4mm, 28.4mm, 50mm, 10-11mm, 5-5.5mm, 5.5mm</p> <p>IECEX TUR 22.0055X TUV 22 ATEX 8890X CCCEX 2023012315061886</p> <p>JPCI CONTROLS</p> <p>Ex to IIC T5 Gb Ex to IIC T95°C Db -30°C ≤ Ta ≤ 80°C</p>	<p>6YTEW2</p> <p>Dimensions: 24.4mm, 28.4mm, 50mm, 11-12mm, 5-5.5mm, 5.5mm</p> <p>6YTEW2 11x5-12x5.5 0223 005</p> <p>IECEX TUR 22.0055X TUV 22 ATEX 8890X CCCEX 2023012315061886</p> <p>JPCI CONTROLS</p> <p>Ex to IIC T5 Gb Ex to IIC T95°C Db -30°C ≤ Ta ≤ 80°C</p>	<p>6YTEW3</p> <p>Dimensions: 24.4mm, 28.4mm, 50mm, 12-13mm, 5-5.5mm, 5.5mm</p> <p>6YTEW3 12x5-13x5.5 0223 005</p> <p>IECEX TUR 22.0055X TUV 22 ATEX 8890X CCCEX 2023012315061886</p> <p>JPCI CONTROLS</p> <p>Ex to IIC T5 Gb Ex to IIC T95°C Db -30°C ≤ Ta ≤ 80°C</p>
<p>6YTEW4</p> <p>Dimensions: 24.4mm, 28.4mm, 50mm, 13-14mm, 6-7mm, 7mm</p> <p>6YTEW4 13x6-14x7 0223 005</p> <p>IECEX TUR 22.0055X TUV 22 ATEX 8890X CCCEX 2023012315061886</p> <p>JPCI CONTROLS</p> <p>Ex to IIC T5 Gb Ex to IIC T95°C Db -30°C ≤ Ta ≤ 80°C</p>	<p>6YTEW5</p> <p>Dimensions: 24.4mm, 28.4mm, 50mm, Ø6-Ø7mm, 6-7mm, 7mm</p> <p>6YTEW5 Ø6-Ø7 0223 005</p> <p>IECEX TUR 22.0055X TUV 22 ATEX 8890X CCCEX 2023012315061886</p> <p>JPCI CONTROLS</p> <p>Ex to IIC T5 Gb Ex to IIC T95°C Db -30°C ≤ Ta ≤ 80°C</p>	<p>6YTEW6</p> <p>Dimensions: 24.4mm, 28.4mm, 50mm, Ø7-Ø8mm, 6-7mm, 7mm</p> <p>6YTEW6 Ø7-Ø8 0223 005</p> <p>IECEX TUR 22.0055X TUV 22 ATEX 8890X CCCEX 2023012315061886</p> <p>JPCI CONTROLS</p> <p>Ex to IIC T5 Gb Ex to IIC T95°C Db -30°C ≤ Ta ≤ 80°C</p>

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## Applications

These cable ends are used to close quickly and without the need for gluing or filling with resin or the terminations of flexible self-regulating or constant power heating cables. **They are instantly tightened and blocked on the cables without special tool or equipment.**

**Their tightening on the cable is made by a butterfly screw which will break at a preset torque. Unscrewing is then impossible. Once installed, they provide an IP67 seal at the end of the cable.**

**Their range of dimensions allows them to be used on most existing heat tracing heating cables in industrial or explosive environments. Their tear resistance is guaranteed regardless of the material of the outer sheath of the heating cable (Polyolefins, PVC, fluoroelastomers, FEP a.s.o.)**

## Main features

**Body material:** UV resistant PA66. (Internal seal is in silicone).

The wings of the body allow to move it away from the piping and improve its cooling. They also allow stable clamping on the piping by a cable tie. A notch prevents the cable tie from slipping

**Maximum temperature resistance:** +80°C. (For higher temperatures, see silicone cable end boots 6YTNJ with silicone resin filling).

**Resistance at minimum temperature:** -30°C (For lower temperatures, see the silicone cable end boots 6YTNJ with silicone resin filling).

**Tear resistance:** Greater than 25 DaN for all models.

This value is equal to or greater than required by standard EN60079-0 for cable terminations in explosive environments and higher than required by standard IEC 62395-1 for heating cables in industrial environment.

**Options:** Special dimensions possible, with minimum order of 1000 pieces.

**Other models:** In some cases, especially for constant power cables with a bus wires spacing of less than 5mm, it is necessary to use the version with silicone gel filling.

**Warning:** These products cannot be used on cables with an external metallic braid not covered by an outer jacket because in this case the waterproofing cannot be achieved. Then use terminations with silicone resin filling. (See types 6YTNJ at the end of this catalogue).

**Classification for hazardous areas:**

Gas: II 2G Ex eb IIC T5 Gb

Dust: II 2D Ex tb IIIC T95°C Db

**Certificates:**

ATEX: TÜV 22 ATEX 8895X

IECEX: IECEX TUR 22.0060X

CCCEX: 2023012315061886

## Main part numbers

Part number*	Minimum cable size	Maximum cable size	Identification
6YTEW16S0F50100	10 x 5mm	11 x 5.5mm	W1
6YTEW26S0F50110	11 x 5mm	12 x 5,5mm	W2
6YTEW36S0F50120	12 x 5mm	13 x 5,5mm	W3
6YTEW46S0F60130	13 x 6mm	14 x 7 mm	W4
6YTEW56S0R60000	Dia. 6mm	Dia. 7mm	W5
6YTEW66S0R70000	Dia. 7mm	Dia. 8mm	W6

\* Types with silicone gel filling: replace S0 by SG in the reference

## Heating wires stripping dimensions

(See the technical introduction for explanation of these dimensions that can be reduced in some cases)

Self-regulating cable with jacketed braid and with clearance between bus wires equal or bigger than 5mm.	Self-regulating cable with jacketed braid and distance between bus wires lower than 5mm.	Constant power cable with jacketed braid, clearance between bus wires equal or bigger than 5mm	Constant power cable with jacketed braid, clearance between bus wires lower than 5mm
<p>There must be a minimum of 10mm distance between the semiconductor core and the metal braid.</p>	<p>One conductor wire must be cut to maintain a 5mm minimum clearance between the 2 bus wires. There must be a minimum of 10mm distance between the semiconductor core and the metal braid.</p>	<p>There must be a minimum of 10mm distance between the bus wires and the metal braid. The small heating wire must not protrude from its insulating jacket</p>	<p>One conductor wire must be cut to maintain a 5mm minimum clearance between the 2 bus wires. There must be a minimum of 10mm distance between the bus wire and the metal braid. The small heating wire must be cut to not protrude from its insulating jacket. <b>It is mandatory to use the termination with silicone gel filling.</b></p>

## Installation instruction

<ul style="list-style-type: none"> <li>- Prepare the end of the cable according to the dimensions given in the table above.</li> <li>- Check that its dimensions are compatible with those written on the selected termination cap.</li> <li>- Check that the calculated or measured operating temperature does not exceed the limit value of 120°C at the termination cap.</li> </ul>			
	<ul style="list-style-type: none"> <li>- Insert the cable into the termination cap, push it strongly until it comes to a stop. (It must penetrate 48mm)</li> </ul>	<ul style="list-style-type: none"> <li>- Tighten the wing screw until it breaks flush with the termination cap.</li> <li>- This screw is calibrated to break when the torque necessary for the pulling force of the cable to comply with standards is reached. <u>The whole assembly is no longer removable.</u> (When the application requests subsequent disassembly, it is possible to replace, before installation, the wing screw with a simple M4 × 8mm grub screw, with hexagonal hollow head. The recommended tightening torque is then 1.3Nm)</li> </ul>	<ul style="list-style-type: none"> <li>- Fix the cable termination cap on the piping or on the surface, using a nylon tie or a metal clamp and placing it on the notch provided, to prevent it from slipping.</li> <li>- Tightening should be moderate so as not to damage the termination cap. If the pipe temperature can rise temperatures up to 80°C, keep the termination away of the tube</li> </ul>

**2 ways in line connection box for heat tracing cables, with insulation piercing terminals, for self-regulating cables**

2 ways in line	Insulation piercing	Wire gauge	Cables diameters		Type
		1~2.5mm <sup>2</sup>	 6 ~ 12.2 8.7 × 3.5 ~ 14.2 × 9.2		<b>Y40</b>

**Wall mounting**

**Pipe surface mounting with short polyamid legs, after tightening them on the bottom**

**Pipe surface mounting with long legs bracket, for 50mm thermal insulation**

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Example of mounting at short distance of the pipe with the **polyamid legs** supplied in standard



Example of mounting at distance of the pipe with the **long legs** stainless steel bracket of type 6YTQT



## Applications

This box is used to connect a **power supply cable to a self-regulating cable, or two self-regulating cables end to end.** It can be mounted flat on a surface, or on a pipe, including with insulation up to 50mm thick.

Access to connectors is very easy, and the connection is very simple, in particular for flat self-regulating cables with **metallic protective braid.**

They can be used in domestic and industrial environments as well as in explosive atmospheres.

### Approvals:

- **Industrial applications in electrical heat tracing** according to IEC 62395.

**For gas hazardous areas**, this equipment is approved as "Ex-eb" and is suitable for use in zone 1 and zone 2, gas group IIC (Hydrogen/Acetylene, the highest protection group), with a temperature classification **T5** ;

**For dust hazardous areas**, this equipment is approved as "Ex-tb", suitable for use in, zone 21 and zone 22, the dust group is IIIC (electric conductive dust, the highest protection group), maximum allowed equipment temperature **95°C.**

### Protection against gaz:

⊕ II 2G Ex eb IIC T5 Gb

### Protection against dust:

⊕ II 2D Ex tb IIIC T95°C Db

### Certificates:

ATEX: TÜV 22 ATEX 8896 X

IECEX: IECEX TUR 22.0061 X

CCCEX: ??

## Main features

**Material:** Fiberglass reinforced polyamide 66 black, 100mm × 60mm × 40mm (Cable glands not included). Superior UV resistance.

**Waterproof grade:** IP67 and IP69K (high pressure hot water washing)

**Shocks resistance:** The highest, IK10 (Cable gland not included).

### Mounting:

- **Wall mounting:** 2 wall mounting lugs allow the mounting on a flat surface. Holes distance 110 × 45mm.

- **Pipe mounting with 10mm offset:** Two removable PA66 tabs are supplied as standard and allow mounting on a tube using a nylon tie or metal clamp. The distance from the tube limits the heating of the box.

- **Pipe mounting with 50mm offset:** one snap-on metal stainless steel bracket allows the installation of a thermal insulation and its protection before snapping-on the box on it and making electric connections (Available as an accessory, see catalogue page on 6YTQT parts).

### Terminals:

- The terminals are piercing the insulation layers with a double chisel blade, and retain the contact pressure by means of an elastic blade (patented).

- **These terminals are designed to receive self-regulating heating cables with any distance between the bus wires between 2mm and 10mm.**

- These terminals can also possibly be used for conventional conductors of power supply cables.

- All terminals are protected against loosening by vibration or thermal shock.

- The mechanical tightening of the cable is ensured by a screwed metal saddle, usable on round or flat cable.

**This patented saddle also ensures the earthing of the metal braid of the heating cables.**

- Wire gauge:  $3 \times 1\text{mm}^2$  to  $3 \times 2.5\text{mm}^2$ .

- Maximum permissible intensity: 16A 250V.

**Cables outlet:** With built-in 1" BSPP cable glands, with 70 shore NBR gaskets (Silicone is available on request).

- **Maximum diameter of round cables:** 8 ; 12 or 14mm depending on the gaskets installed.

- **Limit sizes of oblong cables:**

- from  $8 \times 5$  to  $9.5 \times 6\text{mm}$

- from  $9.5 \times 2.5$  to  $11 \times 3.5\text{mm}$

- from  $11 \times 4$  to  $13 \times 6\text{mm}$

- from  $12.5 \times 8$  to  $14.2 \times 9.2\text{mm}$ .

**Inviolability:** The case can receive one or two seals (Supplied with 5 red plastic ties for use in the sealing holes).

**Ambient temperature limits:**  $-40$  to  $+50^\circ\text{C}$ . ( $-40^\circ\text{F}$  ;  $+122^\circ\text{F}$ )

**Maximum linear power of heating cable:** 75W/m.

**Maximum intensity:** 16A per terminal.

**Easy assembly:** Assembly is made with full access to terminals when cover is removed. Mounting on wall or pipe can be made with cover removed or cover assembled.

**Accessory:** Bracket in stainless steel for offset mounting on pipe with up to 50mm insulation thickness. Designed to snap on the connection box without screws. See the accessories pages for models 6YTQT.

**Options:**

**Consult us for parts numbers of simplified models with only one dimension of cable gland gasket for round wire and flat wires, customized label, and specific set of accessories for pipe mounting (OEM versions).**

## Main references\*

One self-regulating cable to one power supply cable (Y401)

Part numbers	Hole dimension of the seal of cable gland on side A	Hole dimension of the seal of cable gland on side B
Y401N2N500001	NBR seal for round cable dia. 12mm max.	NBR seal for oblong cable from $11 \times 4$ to $13 \times 6\text{mm}$ .
Y401N7N800001	Set of 3 NBR seal for round cable dia. max. 8, 12, 14mm.	Set of 4 NBR seals for oblong cables, from $8 \times 5$ to $9.5 \times 6\text{mm}$ ; from $9.5 \times 2.5$ to $11 \times 3.5\text{mm}$ ; from $11 \times 4$ to $13 \times 6\text{mm}$ ; from $12.5 \times 8$ to $14.2 \times 9.2\text{mm}$ .

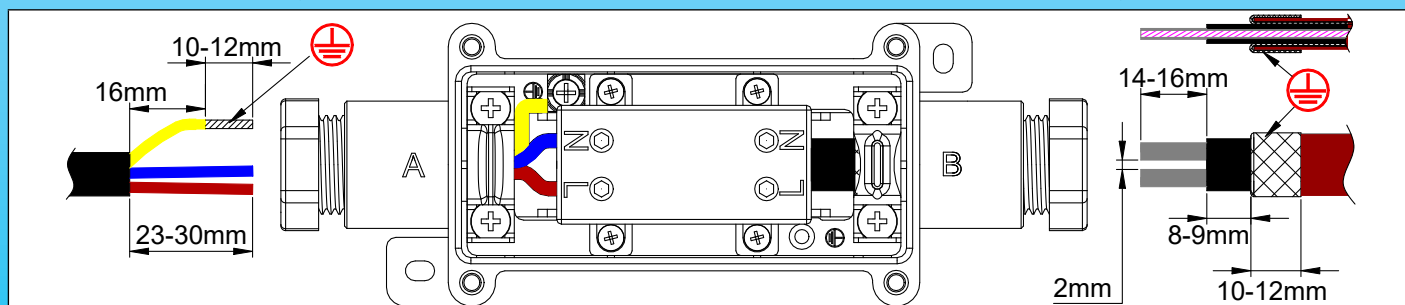
two self-regulating cables end to end (Y402)

Part numbers	Hole dimension of the seal of cable gland on sides A and B
Y402N5N500001	NBR seal for oblong cable from $11 \times 4$ to $13 \times 6\text{mm}$ .
Y402N8N800001	Set of 4 NBR seals for oblong cables, from $8 \times 5$ to $9.5 \times 6\text{mm}$ ; from $9.5 \times 2.5$ to $11 \times 3.5\text{mm}$ ; from $11 \times 4$ to $13 \times 6\text{mm}$ ; from $12.5 \times 8$ to $14.2 \times 9.2\text{mm}$ .

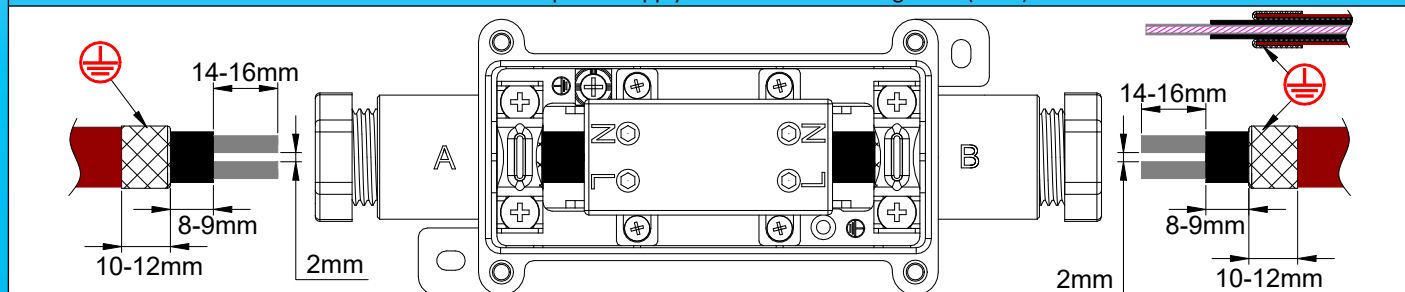
\* Includes 2 plastic tabs for wall mounting and 2 snap-on plastic legs for a 10mm offset mounting from the surface of a pipe.

## Stripping dimensions of the braided self-regulating cable, and stripping dimension of the power supply cable.

(More detailed instructions are available in the technical introduction)



Model with one power supply cable and one heating cable (Y401)



Model with two heating cable (Y402)

## Self-regulating cables assembly steps

<p>1: Cut the cable, slide on it the cable gland nut. Select the cable gland pressure washer and the gasket with the compatible hole diameter and slide them on the cable.</p>	<p>2: Remove external jacket on the requested length.</p>
<p>3: Overlap the braid on the outer jacket and cut the braid at the requested length.</p>	<p>4: Strip heating zone insulation at the requested length.</p>
<p>5: Cut the heating zone between the 2 bus wires at the requested length. It can be made with a special tool (5A) or with a cutter (5B)</p>	<p>6: Trim, if needed, the length of the bus wires.</p>
<p>7: Unscrew the saddle and remove it if necessary, then pass the cable through the cable gland. Slide the end of the self-regulating cable into the terminal block until it stops.</p>	<p>8: Tighten the saddle on the metal braid. Recommended tightening torque: 1.6Nm.</p>
<p>9: Tighten the terminal screw until electrical contact is made with the conductor of the heating cable. Tightening torque is around 1.5Nm. This tightening torque may vary depending on the thickness and hardness of the material of the semiconductor thermoplastic compound. If necessary, check the continuity with an ohmmeter by measuring the resistance between the two terminals N and L.</p>	<p>10: Slide the flat cable gasket and the pressure washer into the cable gland and tighten the nut. Max. tightening torque 3N.m. If not yet made connect the other cable and close the lid.</p>

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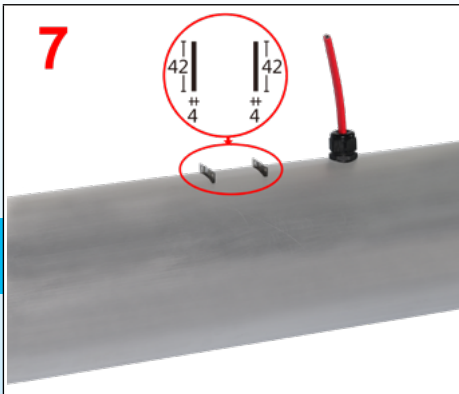
## Round cable assembly steps

<p>1: Remove outer jacket on dimensions requested by drawing. Then strip the ground conductors on 10mm. Eventually, crimp cable shoe on it. Slide the cable gland nut and on the cable. Select the compatible diameter gasket and compression washer and slide them too on the cable.</p>	<p>2: Put the neutral and line wires inside the screw terminals and tighten them. Recommended torque 1.6Nm.</p>
<p>3: Slide the ground wire under the ground terminal square washer and tighten the screw. Put the saddle and its 2 screws on the cable and tighten the screws. Recommended torque for the 3 screws 1.6Nm.</p>	<p>4: Slide the round cable gasket and the compression washer into the cable gland and tighten the nut. Maximum tightening torque 3N.m.</p>

## Assembly steps on pipe with long legs bracket for 50mm thermal insulation.

This bracket has been designed to simplify these assembly steps.

<p>1: Screw the bracket (A) on the bottom of the selected enclosure ;</p>	<p>2: Take the 2 legs (B) and the 4 screws (C)</p>	<p>3: Screw the 2 legs on the bracket A and enclosure sub-assembly</p>
<p>4: Assemble on the pipe with cable ties or stainless steel hose clamp</p>	<p>5: Unscrew the bracket and enclosure sub-assembly and remove it</p>	<p>6: wrap insulation on the pipe, just making two straight cuts for the legs</p>



**7:** Wrap the mechanical protection around the insulation, making two straight cuts for the legs



**8:** Inject sealant around the legs


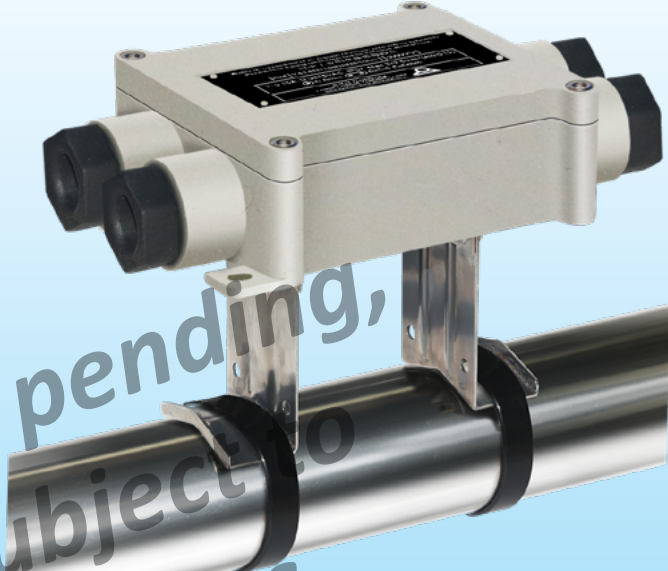


**9:** Screw the bracket and enclosure sub-assembly again on the 2 legs, and make electrical wiring

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<p>Example of mounting on pipe with the plastic legs</p>	<p>Example of mounting at distance of the pipe with the stainless steel bracket type 6YTQT</p>
	

### Applications

This box is used to connect a **power supply cable to 3 self-regulating cable**. It can be mounted flat on a surface, or on a pipe, including with insulation up to 50mm thick. It is designed **to snap** onto the pipe mounting brackets. The terminal blocks are easily accessible and the connection is very simple, in particular for flat self-regulating cables with metallic protective braid.

#### Protection against gaz:

⊕ II 2G Ex cb IIC T5 Gb

#### Protection against dust:

⊕ II 2D Ex tb IIIC T95°C Db

#### Certificates:

ATEX: TÜV 22 ATEX 8896 X

IECEX: IECEX TUR 22.0061 X

CCCEX: ??

### Main features

**Material:** Fiberglass reinforced polyamide 66 black, 105mm × 45mm × 41mm (Cable glands not included). Superior UV resistance.

**Waterproof grade:** IP67 and IP69K (high pressure hot water washing)

**Shocks resistance:** The highest, IK10 (Cable gland not included).

#### Mounting:

- Wall mounting: 2 wall mounting lugs allow the mounting on a flat surface. Holes distance 80 × 110mm.

- Pipe mounting with 10mm offset: Two plastic legs supplied as standard allow attachment to a tube using nylon hose clamps.

- Pipe mounting with 50mm offset: one snap-on metal stainless steel bracket allows the installation of a thermal insulation and its protection before snapping-on the box on it and making electric connections. (Available as an accessory, see catalogue page on 6YTQT parts).

#### Terminals:

- The terminals intended for the self-regulating heating conductors are piercing the insulation layers with a double chisel blade, and retain the contact pressure by means of an elastic blade (patented).

- **These terminals are designed to receive self-regulating heating cables with any distance between the bus wires between 2mm and 10mm.**

- These terminals can also possibly be used for conventional conductors of power supply cables.

- The terminals for the conductors of the power supply cables are clamped with traditional pressure screw. We recommend them for this type of conductor, often flexible type, with many strands of small diameter, that can be damaged by the knives of the insulation piercing terminals.

- All terminals are protected against loosening by vibration or thermal shock.

- The mechanical tightening of the cable is ensured by a screwed metal saddle, usable on round or flat cable.

**This patented saddle also ensures the earthing of the metal braid of the heating cables.**

- Wire gauge: 3 × 1mm<sup>2</sup> to 3 × 2.5mm<sup>2</sup>.

- Maximum permissible intensity: 16A 250V.

**Interconnection:** The neutral terminals (N) are internally connected by a jumper and so are the Line (L) terminals.

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**Cables outlet:** with M24 cable glands, with 70 shore NBR gaskets (Silicone is available on request).

- Maximum diameter of round cables: 8 ; 12 or 14mm depending on the gaskets installed.
- Limit sizes of oblong cables:
- from 8 × 5 to 9.5 × 6mm
- from 9.5 × 2.5 to 11 × 3.5mm
- from 11 × 4 to 13 × 6mm
- from 12.5 × 8 to 14.2 × 9.2mm

For more information about tightening possibilities on round and oblong cables, see the catalogue page on 6YTP cable glands.

**Inviolability:** The case can receive one or two seals (delivered with 5 red seals)

**Sealing:** Supplied with 5 red plastic ties for use in the sealing holes

**Easy assembly:** Assembly is made with full access to terminals when cover is removed. Mounting on wall or pipe can be made with cover removed or cover assembled.

**Accessory:** Bracket in stainless steel for offset mounting on pipe with up to 50mm insulation thickness. Designed to snap on the connection box. See the accessories pages on 6YTQT models

**Options:**

- 3 output models (one cable gland is removed and replaced by a cap)
- Independent lines (internal jumpers between connectors are removed)

**Consult us for parts numbers of simplified models with only one dimension of cable gland gasket for round wire and flat wires, customized label, and specific set of accessories for pipe mounting (OEM versions).**

## Main references

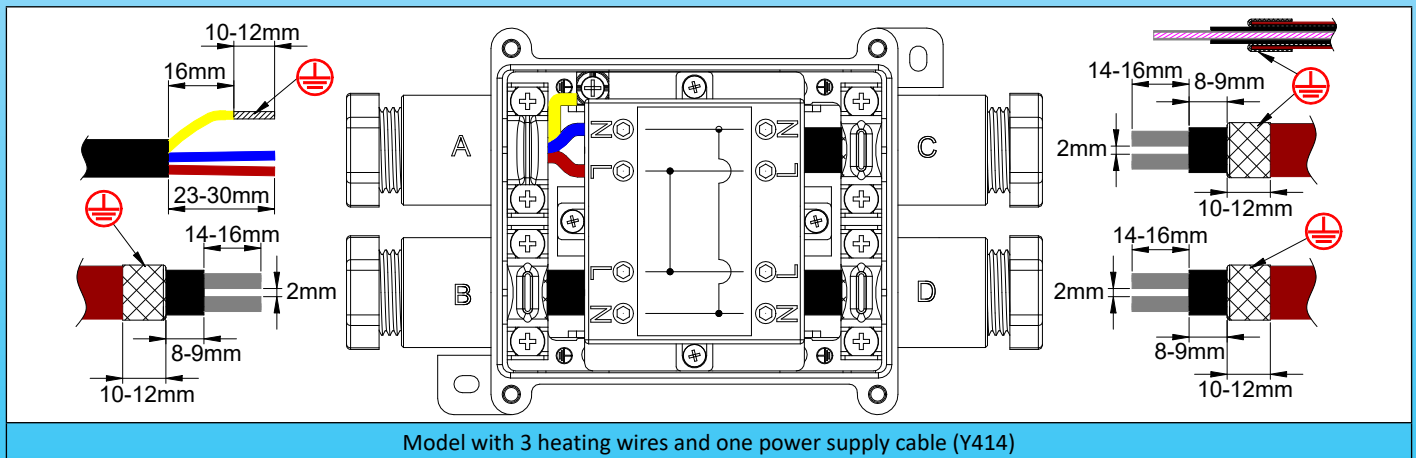
Model for 3 self-regulating cable and one power supply cable (Y414)

Part numbers	Hole dimension of the seal of cable gland on side A	Hole dimension of the seal of cable gland on side B, C, D
Y414N2N5N5N51	NBR seal for round cable dia. 12mm max.	NBR seal for oblong cable from 11 × 4 to 13 × 6mm.
Y414N7N8N8N81	Set of 3 NBR seal for round cable dia. max. 8, 12, 14mm.	Set of 4 NBR seals for oblong cables, from 8 × 5 to 9.5 × 6mm ; from 9.5 × 2.5 to 11 × 3.5mm ; from 11 × 4 to 13 × 6mm ; from 12,5 × 8 to 14.2 × 9.2mm.

\* Includes 2 plastic tabs for wall mounting and 2 snap-on plastic legs for a 10mm offset mounting from the surface of a pipe.

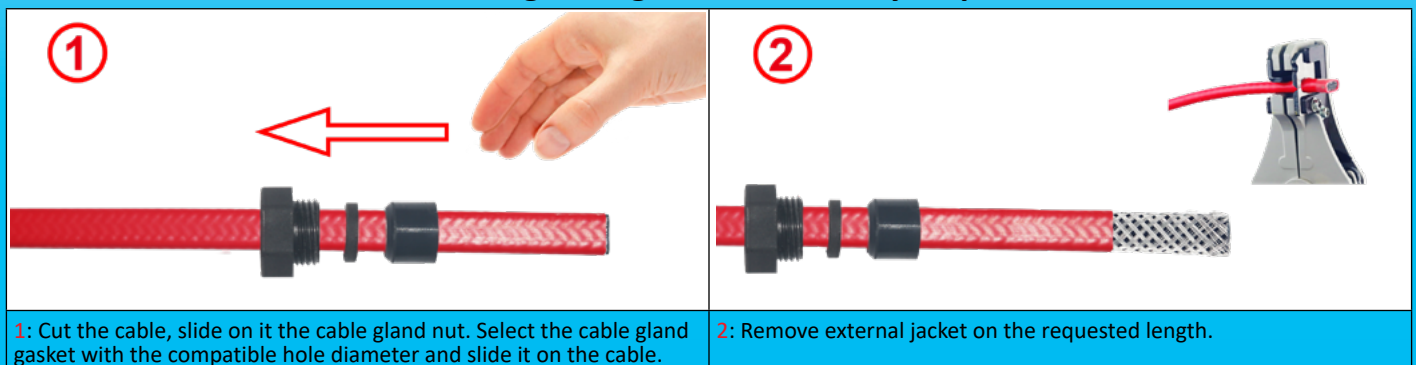
## Stripping dimensions of the braided self-regulating cable, and stripping dimension of the power supply cable.

(More detailed instructions are available in the technical introduction)



Model with 3 heating wires and one power supply cable (Y414)

## Self-regulating cables assembly steps



**1:** Cut the cable, slide on it the cable gland nut. Select the cable gland gasket with the compatible hole diameter and slide it on the cable.

**2:** Remove external jacket on the requested length.



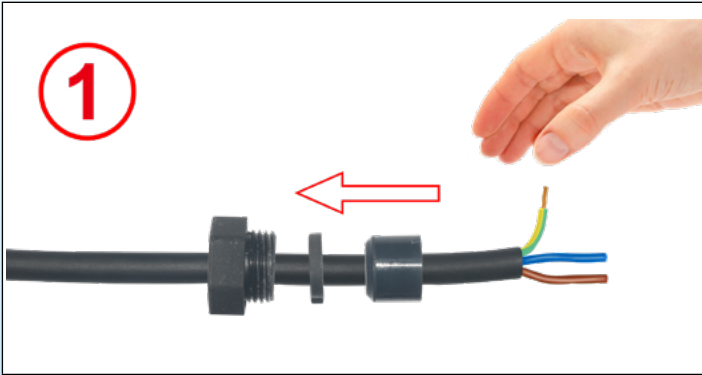
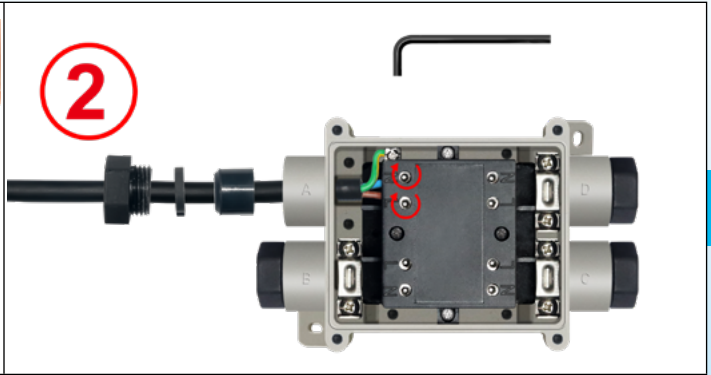
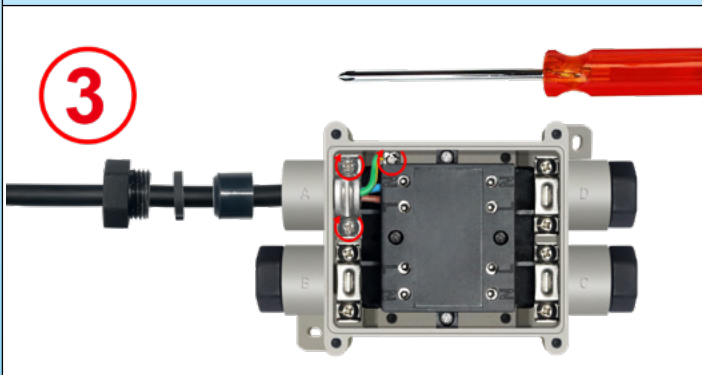
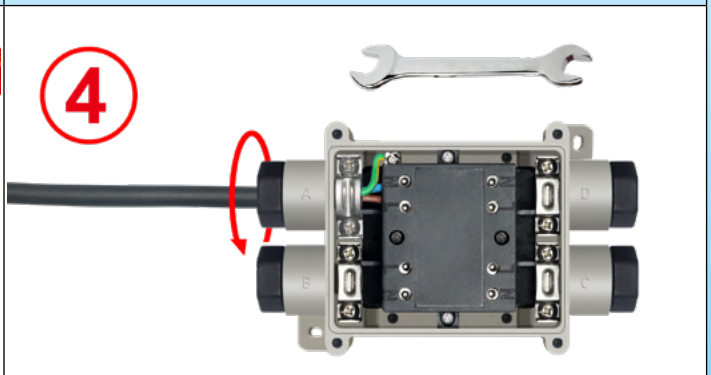
# Heat tracing accessories



<p>3: Cut the braid at the requested length. Don't unweave it.</p>	<p>4: Strip heating zone insulation at the requested length.</p>
<p>5: Cut the heating zone between the 2 bus wires at the requested length.</p>	<p>6: Adjust, if needed, the length of the bus wires.</p>
<p>7: Unscrew the saddle and remove it if necessary, then pass the cable through the cable gland. Slide the end of the self-regulating cable into the terminal block until it stops.</p>	<p>8: Tighten the saddle on the metal braid. Recommended tightening torque: 1.6Nm.</p>
<p>9: Tighten the terminal screw until electrical contact is made with the conductor of the heating cable. Tightening torque is around 1.5Nm. This tightening torque may vary depending on the thickness and hardness of the material of the semiconductor thermoplastic compound. If necessary, check the continuity with an ohmmeter by measuring the resistance between the two terminals N and L.</p>	<p>10: Slide the flat cable gasket into the cable gland and tighten the nut. Max. tightening torque 3N.m. If not yet made connect the other cable and close the lid.</p>

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## Round cable assembly steps




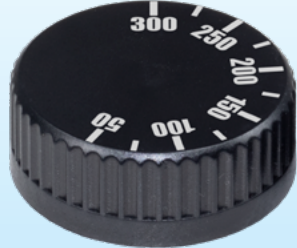
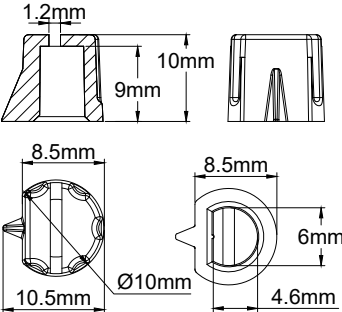
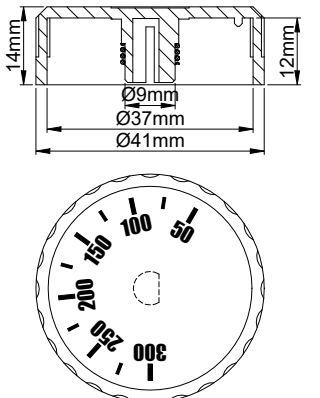
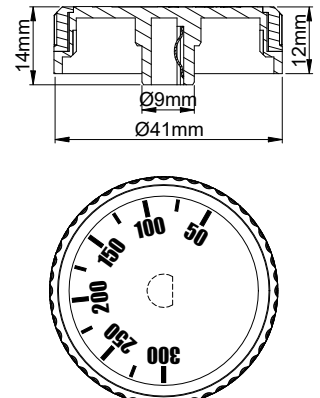
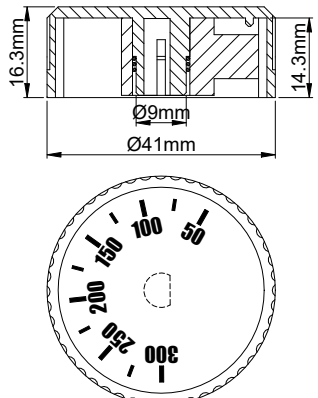
	
<p><b>1:</b> Remove outer jacket on 24mm. Then strip the conductors on 10mm. Eventually, crimp cable shoes. Slide the cable gland nut on the cable. Select the compatible diameter gasket and slide it too on the cable.</p>	<p><b>2:</b> Put the neutral and line wires inside the screw terminals and tighten them. Recommended torque 1.6Nm.</p>
	
<p><b>3:</b> Slide the ground wire under the ground terminal square washer and tighten the screw. Recommended torque 1.6Nm.</p>	<p><b>4:</b> Slide the round cable gasket into the cable gland and tighten the nut. Maximum tightening torque 3N.m.</p>

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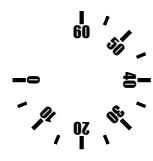
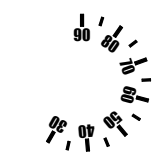

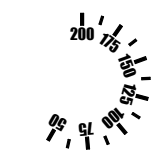
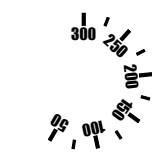


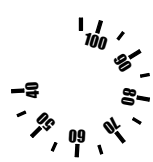




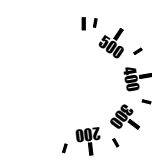


## Knobs

All explosion proof thermostat with set point adjustment type KAA, have shafts with a diameter of 6mm and a 4.6mm flat. Except in special applications, these shafts have a length of 10mm. The screwdriver adjustment shaft of models KAC has a projecting length of 1 to 2mm. The set point increases when the knob is turned clockwise.

											
											
<p>Dia. 10mm miniature arrow knob, with a slot allowing screw driver adjustment (Material: PA66)</p> <table border="1" data-bbox="175 1110 359 1196"> <tr><th>Reference</th></tr> <tr><td>66MQ006</td></tr> </table> <p>Compatible with printed dials 66CA01 and 66CP</p>	Reference	66MQ006	<p>Flat knob, dia. 41mm, height 14mm (Material: PA66)</p> <table border="1" data-bbox="494 1067 742 1153"> <tr><th>Reference</th></tr> <tr><td>66MG006*****</td></tr> </table> <p>Compatible with bezel 66EN1</p>	Reference	66MG006*****	<p>Flat knob, dia. 41mm, height 12mm with soft grip touch (Material PC+ Santoprene)</p> <table border="1" data-bbox="845 1088 1093 1175"> <tr><th>Reference</th></tr> <tr><td>66MZ006*****</td></tr> </table> <p>Compatible with bezel 66EN Standard knob used for thermostat KAA inside aluminium Ex-e enclosure</p>	Reference	66MZ006*****	<p>Flat knob, dia. 41mm, height 16,3mm, with built in adjustable stop (Material: ABS)</p> <table border="1" data-bbox="1197 1088 1444 1175"> <tr><th>Reference</th></tr> <tr><td>66ME006*****</td></tr> </table> <p>Compatible with bezel 66EN Knob used for thermostat KAA inside aluminium Ex-e enclosure when restriction to set point adjustment limits are needed</p>	Reference	66ME006*****
Reference											
66MQ006											
Reference											
66MG006*****											
Reference											
66MZ006*****											
Reference											
66ME006*****											

## Knob printings

White color printing in °C							
-35+35°C	-10+40°C	4-40°C	0-60°C	30-90°C	30-110°C	50-200°C	50-300°C
							
-350353AW	-100403AW	0040403AW	0000603AW	0300903AW	0301103AW	0502003AW	0503003AW
White color printing in °F							
-30-95°F	15-105°F	40-105°F	32-140°F	85-195°F	85-230°F	120-390°F	120-570°F
							
-350353AX	-100403AX	0040403AX	0000603AX	0300903AX	0301103AX	0502003AX	0503003AX

\*\*\*\*\*: The complete reference is achieved by replacing the \* in red in the knob part number by the 9 characters, providing the printing and its position. The flat of the shaft is facing the temperature range high end. Other high end position on request.



## Dials and bezels

The scale on the dial is in the opposite direction of the knob scale, but the set point remains clockwise increase.

<p>Square printed dial, mounting with 2 M4 screws, 28mm distance. (Material: PBT)</p> <p><b>References</b></p> <p>66CP01*****</p> <p>Compatible with screwdriver adjustment thermostat type KAC or on 10mm long shaft thermostat type KAA + 66MQ miniature knob</p>	<p>Square printed dial, push in mounting inside M4 threads, 28mm distance. (Material: PBT)</p> <p><b>References</b></p> <p>66CP02*****</p> <p>Compatible with screwdriver adjustment thermostat type KAC or on 10mm long shaft thermostat type KAA + 66MQ miniature knob</p>	<p>Chrome plated bezel for knobs dia. 41mm (Material: ABS)</p> <p><b>References</b></p> <p>66EN2</p> <p>Compatible with knobs 66MG, 66MZ, 66ME</p>	<p>Black for knobs dia. 41mm (Material: ABS)</p> <p><b>References</b></p> <p>66EN1</p> <p>Compatible with knobs 66MG, 66MZ, 66ME</p>

## Dials printings

White color printing in °C							
-35+35°C	-10+40°C	4-40°C	0-60°C	30-90°C	30-110°C	50-200°C	50-300°C
-35035CAW	-10040CAW	004040CAW	000060CAW	030090CAW	030110CAW	050200CAW	050300CAW
White color printing in °F							
-30-95°F	15-105°F	40-105°F	32-140°F	85-195°F	85-230°F	120-390°F	120-570°F
-35035CAX	-10040CAX	004040CAX	000060CAX	030090CAX	030110CAX	050200CAX	050300CAX

\*\*\*\*\*: The complete reference is achieved by replacing the \* in red in the dial part number by the 9 characters providing the printing and its position. The flat of the shaft is facing the temperature range high end. Other high end position on request. Many other knobs, dials, bezels exist. See the full list in the catalogue N°1.



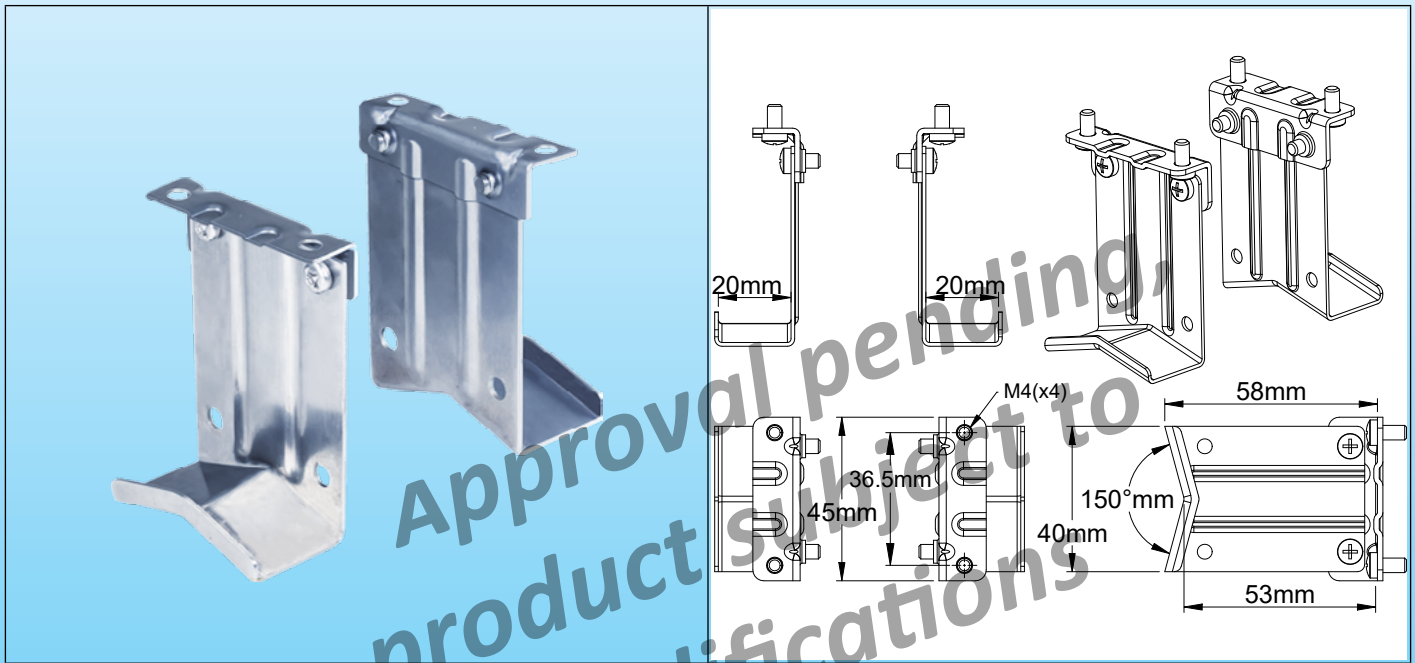
## Examples of assembly on thermostats

<p>Thermostat type KAA with softgrip knob 66MZ and 66EN1 bezel</p>	<p>Thermostat type KAA with miniature knob 66MQ and 66CP02 printed dial</p>
<p>Thermostat type KAA with adjustable stop knob 66ME and 66EN1 bezel</p>	<p>Thermostat type KAC with 66CP01 printed dial assembled with 2 screws M4</p>

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**Stainless steel mounting feet** for explosion proof enclosures, screwed on their bottom. Mounting on pipes by nylon ties or metal clamps.

Material	Fixing	Distance to pipe	Assembly on box		Type
Stainless steel	On pipe	~50mm	Screwed		6YTQTW46



Example of assembly on 140 × 110 × 90mm enclosure (Type Y9)



Example of assembly on Y40 heat tracing connection box

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Approval pending, product subject to modifications

## Applications

These metal brackets allow to mount connection boxes for heating cables on pipes, keeping a distance of about 50mm with the pipes, which allows thermal insulation and its protection to be installed. These models allow this insulation to be carried out after the heating cables have been laid and before the boxes have been laid and connected.

The removable legs, fixed by 2 screws on the side of the bracket body can be mounted on the pipe before the thermal insulation, then requesting only two straight cut on it before to screw the legs on the bracket body. The use of stainless-steel limits thermal conduction by the feet from the pipe to the box.

## Part numbers

Material	Part number	Can be used on:
SUS304	6YTQW46	Y40, Y41, Y50, Y51, Y9
SUS316	6YTQW66	Y40, Y41, Y50, Y51, Y9

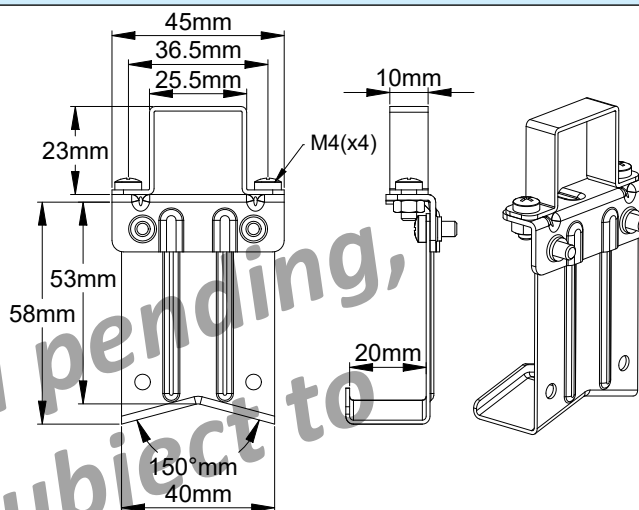
## How to install these pipe mounting legs on thermally insulated pipe

<p>1: Screw the bracket (A) on the bottom of the selected enclosure ;</p>	<p>2: Take the 2 legs (B) and the 4 screws (C)</p>	<p>3: Screw the 2 legs on the bracket A and enclosure sub-assembly</p>
<p>4: Assemble on the pipe with cable ties or stainless steel hose clamp</p>	<p>5: Unscrew the bracket and enclosure sub-assembly and remove it</p>	<p>6: wrap insulation on the pipe, just making two straight cuts for the legs</p>
<p>7: Wrap the mechanical protection around the insulation, making two straight cuts for the legs</p>	<p>8: Inject sealant around the legs</p>	<p>9: Screw the bracket and enclosure sub assembly again on the 2 legs, and make electrical wiring</p>

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**Stainless steel mounting foot for explosion proof heat tracing cable termination. Mounting on pipes by nylon ties or metal clamps.**

Material	Fixing	Distance to pipe	Assembly on box		Type
Stainless steel	On pipe	~50mm	Screwed		6YTQTV47



Example of assembly on heat tracing cable termination 6YTEW

**Applications**

This metal bracket allows to mount heat tracing heating cable termination on pipes, keeping a distance of about 50mm with the pipes, which allows thermal insulation and its protection to be installed and avoid to reach Ex prohibited ambient temperature on the termination, e.a. when the pipe surface temperature is too high. The use of stainless-steel limits thermal conduction by the feet from the pipe to the box.

**Part numbers**

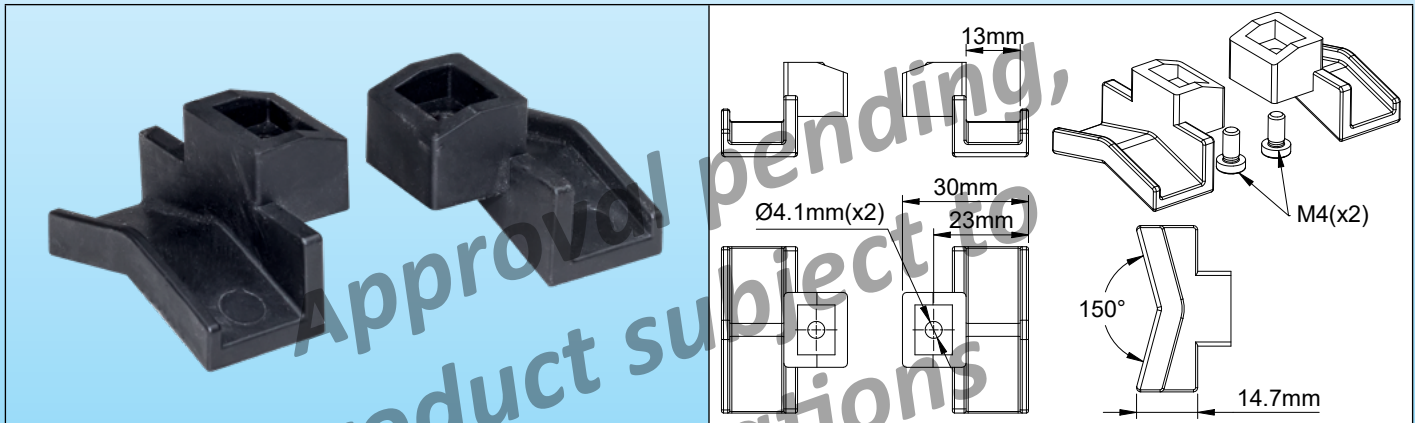
Material	Part number	Can be used on:
SUS304	6YTQTV47	6YTEW
SUS316	6YTQTV67	6YTEW

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**PA66 brackets** for explosion proof or industrial enclosures in aluminum or PA66, screwed on their bottom. Mounting on pipes by nylon ties or metal clamps.

Material	Fixing	Distance to pipe	Assembly on box		Type
PA66	On pipe	~10mm	Screwed		<b>6YTQUVA5</b>



Example of assembly on heat tracing connection box in aluminium type Y40



Example of assembly on heat tracing connection box in PA66 type Y51 (see catalogue 12)

### Applications

These PA66 brackets allow to mount connection boxes for heating cables on pipes, keeping a distance of about 10mm with the pipes, These PA66 brackets allow to mount connection boxes for heating cables on pipes, keeping a distance of about 10mm with the pipes, they are usually included as standard accessories in these products.

### Part numbers

Part number	Can be used on:
6YTQUVA5	Y40, Y41, Y50, Y51

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- Flow switches
- Level switches
- Pressure switches and air switches
- Fusible links and fire detection mechanisms
- Tracing equipment
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# QUESTION 4

EXPLORATION OF THE PROPERTIES OF CONJUGATED POLYMER NANOPARTICLES

1. Introduction: Conjugated polymers are a class of polymers with alternating single and double bonds, which can absorb and emit light in the visible and near-infrared regions. They have found applications in organic light-emitting diodes (OLEDs), solar cells, and photodetectors.

2. Synthesis: Conjugated polymer nanoparticles can be synthesized using various methods, including emulsion polymerization, precipitation, and self-assembly. The choice of method depends on the desired polymer structure and the target application.

3. Properties: The properties of conjugated polymer nanoparticles, such as their size, shape, and optical absorption/emission spectra, are strongly dependent on the synthesis conditions and the polymer structure. For example, smaller nanoparticles generally exhibit higher quantum yields and narrower emission spectra.

4. Applications: Conjugated polymer nanoparticles have a wide range of applications, including as fluorescent probes for biological imaging, as light-emitting diodes for display technologies, and as active layers in organic solar cells. Their unique properties make them attractive for many emerging technologies.

5. Conclusion: Conjugated polymer nanoparticles are a promising class of materials with a wide range of applications. Further research is needed to optimize their synthesis and properties for specific applications.

6. References: [1] Smith, J. D., & Jones, M. A. (2010). Synthesis and properties of conjugated polymer nanoparticles. *Journal of Polymer Science: Part A: Polymer Chemistry*, 48(12), 2800-2810. [2] Lee, S. H., & Park, S. Y. (2011). Self-assembly of conjugated polymer nanoparticles. *Chemical Reviews*, 111(1), 1-20. [3] Kim, J. H., & Park, S. Y. (2012). Conjugated polymer nanoparticles for photovoltaic applications. *Journal of Materials Chemistry*, 22(18), 8500-8510.

7. Appendix: The following table shows the optical absorption and emission spectra of conjugated polymer nanoparticles synthesized using different methods. The absorption peaks are shown in the left column, and the emission peaks are shown in the right column.

Synthesis Method	Absorption Peak (nm)	Emission Peak (nm)
Emulsion Polymerization	420	520
Precipitation	430	530
Self-assembly	440	540

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10. Keywords: Conjugated polymer nanoparticles, synthesis, properties, applications, photovoltaic, OLEDs, biological imaging.

11. Abstract: Conjugated polymer nanoparticles are a class of materials with unique properties and a wide range of applications. This review discusses the synthesis, properties, and applications of conjugated polymer nanoparticles, with a focus on their use in photovoltaic devices, OLEDs, and biological imaging.

12. Introduction: Conjugated polymers are a class of polymers with alternating single and double bonds, which can absorb and emit light in the visible and near-infrared regions. They have found applications in organic light-emitting diodes (OLEDs), solar cells, and photodetectors. Conjugated polymer nanoparticles are a promising class of materials with a wide range of applications. Further research is needed to optimize their synthesis and properties for specific applications.

13. Synthesis: Conjugated polymer nanoparticles can be synthesized using various methods, including emulsion polymerization, precipitation, and self-assembly. The choice of method depends on the desired polymer structure and the target application. Emulsion polymerization involves the dispersion of monomers in water, followed by the addition of a surfactant and a radical initiator. Precipitation involves the addition of a non-solvent to a solution of the polymer, causing it to precipitate out of the solution. Self-assembly involves the spontaneous organization of polymer chains into a specific structure.

14. Properties: The properties of conjugated polymer nanoparticles, such as their size, shape, and optical absorption/emission spectra, are strongly dependent on the synthesis conditions and the polymer structure. For example, smaller nanoparticles generally exhibit higher quantum yields and narrower emission spectra. The optical absorption and emission spectra of conjugated polymer nanoparticles are shown in the table below.