VULCANIC

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ROOM HEATERS

type RADEB

equipped with a flameproof terminal box, for use in potentially explosive zones

(Type of protection “Ex d”)

Completely read the instructions manual before use.

This document is an integral part of the product it is referring to.
Complete compliance with its contents is mandatory to maintaining the guarantee of the product and it’s safety in potentially explosive atmospheres.

In accordance with the European directives, the seller must deliver this instructions manual to the final user with a translated version (native language of the country where the equipment is to be installed). VULCANIC must be contacted if some documents quoted in the present manual are not available or if the information delivered in it does not appear to be clear. If necessary a VULCANIC site technician shall be requested for commissioning.

The contents of these pages were selected with great care. Nevertheless, if ever there have been errors or omissions in this description, thank you for letting VULCANIC know about it.
The contents of this manual are subject to change without prior notice. The manuals updates can all be accessed quickly and reliably through a simple request.

1. AREA OF APPLICATION

The RADEB room heater is an electrical room heater that has undergone extensive testing and several quality checks to ensure a complete satisfaction.

Appropriate specification, according to your process, and compliance with the instructions in this manual will ensure an optimum working life for your equipment.

Before setting up the installation, check both the model and power supply suit your application. The wiring of this equipment must be executed with the in forces rules by qualified staff.

This manual gives the assembly and adjustment instructions to be applied for optimum operation of your instrument. You must read and obey these instructions when installing your equipment. It also lists the special conditions for a safe use of the RADEB room heaters in potentially explosive atmospheres.

The RADEB room heaters are destined to heat potentially explosive ambient gas using natural or forced convection and with a maximum 95% relative humidity. In the absence of a grille to protect against the dangers of hot surfaces, it is not suitable for heating rooms.

Any modification of the room heaters without the proper authorization from VULCANIC is strictly forbidden. VULCANIC cannot be held liable in case of non-respect of this instruction.

This equipment can be used in potentially explosive atmospheres according to:
- the **2014/34/EU** directive and the EC-type examination certificate **INERIS 11 ATEX 0046**
- and the **IECEx** scheme with the certificate of conformity **IECEx LCI 11.0021**.

It has been designed and manufactured in compliance with the essential requirements of health and safety specified in the standards IEC/EN 60079-0, IEC/EN 60079-1 and IEC/EN 60079-14.

It bears the marking:
II 2 G Ex d IIC T3 ou T4 Gb

It is thus usable on the surface, in risk zones 1 and 2, in a IIA or IIB or IIC gas subdivision.

The equipment's ambient temperature of use is different according to the model:
from -20 °C to 40 °C or **from -20 °C to 60 °C** or **from -60 °C to 40 °C** or **from -60 °C to 60 °C**

Its detailed technical characteristics and operating limits are listed in the contractual documentation whose number is written on the rating plate, on the acknowledgement of receipt of order and on the delivery note (reference, type, specification or drawing).

2. DESCRIPTION

The rrom heater is composed of:

- a bundle of **1 to 6 tubular heating element(s) formed in single hairpin** or **1 to 12 heating cartridge(s)** with optional fins. The diameter of the heating elements can vary from 6.5 mm to 19 mm;
- a **mechanical mounting device** such as a screw-in plug or flange;
- a **flameproof terminal box** certified with the EC-type examination certificate LCIE 03 ATEX 0030U, protected with a minimum rate of IP 55, equipped with its Earth terminals (for equipotential connection);
- one or several **flameproof cable gland(s)**. When they are screwed in a 3/4" NPT thread, they are delivered with several seals (allowing the passage of an electrical cable of an external diameter from 8 mm to 18 mm);
- a possible **temperature safety device** whose sensor measures the surface temperature of the heating elements using a thermal bridge (thermostat or thermocouple or Pt100 probe).
- a possible **perforated protective grille** with 2 floor fixing feet, for room heating applications.

3. GENERAL PRECAUTIONS FOR USE

- It is absolutely forbidden to open the lid when the terminal box is placed in a hazardous area and supplied with power.

- Do not energize the system before making sure the lid is properly closed and the locking device reinstalled.

- It is essential that the packing of the cable entries seals is compatible with the cables used. Check the real clamping diameter in the contractual documentation. Standard packings are designed for cables with cylindrical external sheath. If necessary, source the suitable packing.

- It is not recommended to unmount the cable entries that have been installed in the manufacturer's factories, due to the risk of damaging the existing threads. Nevertheless, if this operation is necessary, the mounting and the unmounting must be performed in accordance with the current standard IEC/EN 60079-14.

- When the cable entries are borne by the final user, it is mandatory that they are certified with the flameproof type of protection Ex d and compatible with the holes drilled in the terminal box where they are supposed to be installed on (in accordance with the diameter and the pitch of the contractual drawing).

- Unused holes must be locked with Ex d certified plugs.

- The power and instrumentation cables shall be sheathed with thermoplastic, thermosetting or elastomeric material; they shall be circular and compact; they have to measure at least three meters.

Otherwise, it is mandatory to plan the mounting of cable entries locked with the help of a setting compound, in accordance with the requirements described the current standard IEC/EN 60079-14.

- Before closing the terminal box, check that the gas lamination surfaces (thread pitch or spigot surface between the body and the lid) do not show any mechanical damage or foreign particles. Clean those surfaces if necessary.

- The terminal box can be closed with the help of a corrosion inhibiting grease of a type that does not harden because of ageing, does not contain an evaporating solvent and does not cause corrosion of the joint surfaces. Its flash point must be higher than the maximum temperature reached by the terminal box.

- In natural convection, the heating elements must be placed horizontally. They must not be covered, so as to allow good air circulation. A free space of a minimum height of 150 mm must be present above and below the heater bundle.

- In forced convection, the heating elements can be placed in all positions. Nevertheless a minimum required mass flow of the gas to be heated must be monitored, energizing the heater can only be enabled if this prerequisite is fulfilled.

- When a safety device is mounted on the heating element, it must irreversibly cut the electrical power supply in the event of a failing (independently from the control device), which requires a human intervention to reset the installation after seeking the cause of the failure. Its set point is defined at maximum 195 °C in class T3 and maximum 130°C in class T4. Its interpretation must have a fast and positive action; it must act directly on the room heater’s power supply and must not be relayed through a software. If this cannot be secured, the safety circuit must have a minimum integrity level of SIL 1, as required by standard EN 50495.

- When a limitation device is mounted on a heating element, it must be wired in series with the safety device described above. This device is preset by VULCANIC to a set point that avoids the surface of the elements to reach a temperature of 195 °C in class T3 and 130 °C in class T4, in the most unfavourable normal or accidental operating conditions. This setting depends on the response time and on the differential of the device.

- It is forbidden to modify any adjustment of the limiting and safety settings done in the VULCANIC facilities.

- In the absence of a temperature safety device, the user must implement a monitoring of the supply voltage, which must not exceed the rated voltage by more than 10% and the ambient temperature of the box, which must not exceed 40 °C or 60 °C (depending on the model).

- The quality of the atmosphere in which the room heater is installed must be compatible with the austenitic stainless steel composing the sheath of the heating elements, so as not to damage them by corrosion.

- The specifications of the installation standard IEC/EN 60079-14 must be followed, particularly for monitoring the insulation of the room heater. A loss in the insulation could be a sign of a leak in the sealing of the heating elements, which requires an immediate switching off of the power supply.

4. ELECTRICAL CONNECTION

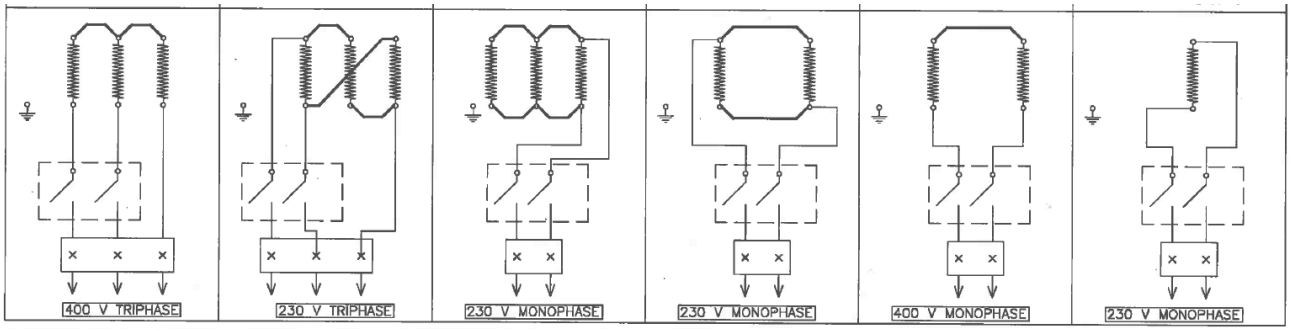
This connection must be performed when the power supply is switched off.

Note: The power supply tension to be used must be the one indicated on the rating plate. It must not be 10% greater than the nominal value. In the dual voltage wiring case, it needs to be checked that the constructed coupling is corresponding to the main voltage. It is hazardous to construct the coupling corresponding to the minimum voltage when the room heater has not been installed in a removable manner.

Removing the cover:
- Remove the 4 fixing screws.
- Remove the cover.

Warning: the fitting of the lid into the body is specific to this equipment because the adjustment is made in our facility. Do not swap around the covers of 2 room heaters.

After introducing the cable through the cable gland, connect the two or three phases to the terminals according to one of the following diagrams.



These couplings are generally made in the VULCANIC factories. Modifying them is strictly forbidden.

The external Earth terminal must be connected to the installation Earth.

Check that all the connections are correctly tightened.

Tighten the cable gland bushing to seal the cable sheath.

If necessary, adjust the controlling thermostat as indicated in paragraph 7.

Put the lid back on its place, engaging it completely (in order to comply with the flameproof joint length).

Fully screw the lid and tighten the 4 attaching screws.

5. COMMISSIONING AND OPERATION

Only qualified personnel can operate on the equipment. The installer must check that the equipment is in compliance with the hazardous zone of operation and with the characteristics of the different inflammable substances.

Only energize the system after putting and tightening the lid to the enclosure.

Note: The minimum insulation and strength values must be checked at ambient temperature after a long period of standstill because they guarantee the quality of the heating elements and this reduces the risk of a spark appearing.

6. MAINTENANCE:

Given the fact our room heaters are very simple and highly reliable, they only require minimal maintenance actions.

- After 50 hours of working operation, check that the connections are still well tightened (for removal and mounting, see § 6 above).
- Check that the grill and the finned part are not clogged with dust (remove dust if necessary).
- In the event of replacing heating elements, contact Vulcanic.

Any repair related to the Ex protection method must be subject to an evaluation by an approved body, which will decide on the procedures to be applied. It can only be done after having obtained the agreement of Vulcanic.

In a more specific way, the flamepaths cannot be repaired and the manufacturer Vulcanic must be contacted.

7. GUARANTEE

Our warranty is compliant with the inter-trade agreements of the Electric Construction Association and with our general sales conditions. We are guarantors of the compliance of the equipment and of the surface treatments, as defined in our documents.

Damage caused by:

- the non-compliance with the operating limits,
- the wear caused by the lack of maintenance, shocks, clumsiness or the inexperience of the user,
- the corrosion or clogging phenomena,
- the non-compliance with the present instructions manual, the sate of the art and legislation,

will not engage our responsibility.