



[1] **EU-TYPE EXAMINATION CERTIFICATE**

[2] **Equipment intended for use in potentially explosive atmospheres Directive 2014/34/EU – Annex III**

[3] Certificate Number: **EPT 18 ATEX 2960 X issue 2**

[4] Equipment: **Plug-mounted electrical heaters**  
Series **GTF 90/162**

[5] Manufacturer: **MASTERWATT S.r.l.**

[6] Address: **Via Collegno n° 31, 10044 Pianezza (TO) - Italy**

[7] This equipment and its accepted variations are specified in the annex to this Certificate.

[8] Eurofins Product Testing Italy S.r.l., Notified Body n. 0477 in accordance with Article 21 of the Directive 2014/34/EU of the European Parliament and of the Council of 26th February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II of the Directive. The examination and test results are recorded in the confidential Report N°EPT.23.REL.02/2213096


[9] Compliance with the essential health and safety requirements is assured through the verification of them and by compliance with the following harmonized standards:

**EN 60079-0:2018, EN 60079-1:2014, EN 60079-7:2015+EN IEC 60079-7/A1:2018, EN 60079-31:2014**

[10] If the sign "X" is placed after the Certificate number, it indicates that the equipment is subject to the special conditions for safe use specified in the annex to this Certificate.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design, the exam and the tests of the specified equipment.

Further requirements of the Directive 2014/34/EU apply to the manufacture and supply of this equipment. These requirements are not object of this Certificate.

[12] The equipment shall include the sign  and the following strings:

**II -/2G Ex db IIC T6...T1 -/Gb** **-xx°C ≤ Ta ≤ +xx°C**

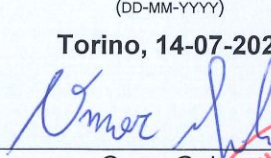
**II -/2D Ex tb IIIC T85°C...T450°C -/Db** **-xx°C ≤ Ta ≤ +xx°C**


**II 2G/2G Ex db eb IIC T6...T1 Gb/Gb** **-xx°C ≤ Ta ≤ +xx°C**

*See the equipment description for details related to the maximum surface temperatures and ambient temperature ranges*

Place and date of issue:  
(DD-MM-YYYY)

**Torino, 14-07-2023**

  
Omar Galasso  
Deputy Head of Directive

  
Paolo Trisoglio  
Managing Director



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This Certificate has 6 pages and it is reproducible only in its entirety. Conditions of validity are reported below.



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**ANNEX**

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**[15] Equipment description**

The plug-mounted electrical heaters Type GTF 90/162 are composed of a heating unit (increased safety construction) and a terminal box (flameproof and/or dust tight construction). The heating unit includes one or more heating elements. The heater is attached to the heated vessel through a threaded plug. Coupling through a flange (whose size is bigger than the plug) is allowed too.

The heating elements are made of a resistive wire insulated by means of MgO from the external metallic sheet that is in direct contact with the fluid to heat.

The explosion proof enclosure can be connected directly to the threaded plug or can be spaced from it by a neutral extension. The heating elements can be permanently secured to the threaded plug or can be dismountable (bite coupling elements).

The heaters are supplied with one or more thermowells for the insertion of one or more temperature control sensing probes whose terminals are located in the terminal box.

The heaters can be used for the heating of solids, liquids or gases and are intended to be installed in the boundary wall between the process (EPL Gb or no EPL required) and the external atmosphere (EPL Gb and/or EPL Db). They are suitable for gas group IIC and dust group IIIC.

**Electrical characteristics**

Maximum voltage: 750 V

Maximum current: 56 A

Maximum power: 42 kW

Rated Frequency: 50/60 Hz (operation with Continuous Current is allowed too)

Degree of protection: IP 66/68 (1h submersed at a depth of 1m).

Maximum range of ambient temperature:  $-60^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$

**Surface temperature**

The temperature class of the equipment **T6...T1 / T85°C...T450°C** is specified and affixed on the nameplate by the manufacturer on the basis of the tables below reported. The maximum surface temperature for equipment suitable to be used with flammable dust is selected as the highest temperature value for the corresponding Tclass. The cable design temperature is defined by the manufacturer and affixed on the nameplate based on the maximum temperature of the elements terminal studs and on the type of cable connection arranged inside the heater.

The following tables provide the temperature class and indirectly the max surface temperature for applications with combustible dusts (see above) with reference to the ambient temperature range, process temperature and length of the neutral section

Table 1: Maximum Ambient Temperature +40 °C – Maximum Current 56A – Integral plug

Neutral section length (mm)	Temperature class								
	50 °C	70 °C	100 °C	150 °C	195 °C	250 °C	290 °C	350 °C	400 °C
300	T6	T5	T4	T3	T3	T2	T2	T1	T1
250	T6	T5	T4	T3	T3	T2	T2	T1	T1
200	T6	T5	T4	T3	T3	T2	T2	T1	T1
150	T6	T5	T4	T3	T3	T2	T2	T1	T1
100	T6	T5	T4	T3	T3	T2	T2	T1	T1
0	T6	T5	T4	T3					
	PROCESS TEMPERATURE								

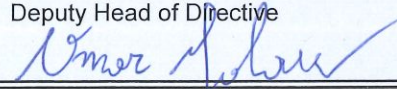
Table 2: Maximum Ambient Temperature +60 °C – Maximum Current 14A – Carved plug



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Neutral section length (mm)	Temperature class				
	60 °C	100 °C	150 °C	200 °C	250 °C
300	T5	T4	T3	T2	T2
250	T5	T4	T3	T2	T2
200	T5	T4	T3	T2	T2
150	T5	T4	T3	T2	T2
100	T5	T4	T3	T2	T2
0	T5	T4	T3		
PROCESS TEMPERATURE					

Table 3: Maximum Ambient Temperature +70 °C – Maximum Current 14A – Carved plug

Neutral section length (mm)	Temperature class				
	60 °C	100 °C	150 °C	200 °C	250 °C
300	T5	T4	T3	T2	T2
250	T5	T4	T3	T2	T2
200	T5	T4	T3	T2	T2
150	T5	T4	T3	T2	T2
100	T5	T4	T3	T2	T2
0	T4	T3	T3		
PROCESS TEMPERATURE					

**Cable entries**

The cable entry devices used on the enclosure have to be suitably ATEX certified. They have to be chosen according to the type of protection, the operating temperature indicated in the manufacturer's instructions, the type of thread and the degree of protection of the equipment.

**Warning marking**

"Do not open when energized"

"Pictogram on high temperatures and request to refer to the instructions manual"

**Routine tests**

If the heater marking is "Ex db eb IIC T6...T1 Gb/Gb" the manufacturer has to perform:

- the dielectric strength test (in compliance with clause 7.1 of EN 60079-7) between galvanically isolated parts with a minimum voltage of  $(2*U+1000)$  V r.m.s. for 60 s, where "U" is the working voltage. As an alternative, the test can also be conducted at  $(2*U+1000)*1.2$  V r.m.s. for  $t>0.1$ s;
- the integrity of the welded construction shall be verified by means of routine overpressure testing (In compliance with clause 16 of EN 60079-1). As an alternative, when this test is impractical, the integrity of the welds may be verified by the Liquid penetrant weld inspection method:

**[16] Assessment Report n° EPT.23.REL.02/2213096**

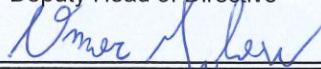
This EU-Type Examination Certificate is released after the positive result of the conformity assessment of the Council Directive 2014/34/EU and to harmonized technical standards listed in this certificate performed by the Notified Body Eurofins Product Testing Italy S.r.l., and reported in the Assessment Report above cited.



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**[17] Special condition for a safe use**

- Flameproof joints are not intended to be repaired
- The user has to periodically clean the enclosure in order to avoid dust deposit
- The supply cable shall be suitable for an operating temperature equal or greater than the temperature indicated on the label.
- The user shall adopt the following additional safety measures:
  - Heating of liquids: the user shall take adequate measures (e.g. by means of a level switch) to guarantee that the heater is operating only when the fluid level is at least 50 mm above the highest heated part of the heater
  - Heating of static gases in processes with EPL required: the user shall guarantee that the temperature of the volume where the heater is used is maintained below the limits specified on the heater nameplate by the manufacturer. The user shall further protect the equipment with a residual current device according to clause 5.8.6 of EN 60079-7
  - Heating of forced flow gases in processes with Gb EPL required: the user shall take appropriate measures to:
    - protect the equipment with a residual current device according to clause 5.8.6 of EN 60079-7
    - stop the power supply to the heater in case the fluid flow rate drops below the minimum value specified by the manufacturer.
    - connect the safety sensor, installed by the manufacturer in one heating element for surveillance of the maximum skin temperature, to a suitable control system. Make sure that no single failure in the equipment or in the supply (here including also the open circuit of a single heating element) can cause a local reduction of temperature in the controlled element while the other elements normally work (see instructions for the details)
    - make sure that, in case the heater consists of several independent power supply stages, the stage in which the safety sensor is located is always ON or is the first to be switched on and the last to be switched off. If this is not possible, the user shall request to the manufacturer to supply a heater with one safety device for each power supply stage

Heating of dynamic fluids: special case hothead execution (low inlet temperature of the fluid to be heated): in addition to the safety devices described in the above, these heaters shall be equipped with a safety device that monitors the fluid temperature, in the area close to the heater coupling device to the plant, and intervenes when this temperature exceeds the safety value specified in the manufacturer's documents and representing the basis for the definition of the maximum temperature inside the heater terminal box.

All the safety functions above mentioned must be in addition to the normal process control functions and shall:

- produce the shutdown of the heater and realize the transition to a safe state of the plant in case of activation of any of the safety devices is followed by the; the activation cannot have an automatic reset
- set up a safety chain SIL 1 in accordance with the prescriptions of EN 50495 standard in the case where EPL Gb is required in the process side.

**[18] Essential Health and Safety Requirements**


Assured by compliance with harmonized standards.



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**[19] Descriptive documents**

The equipment object of this Certificate are described by the following documents that are scheduled documents and therefore they cannot be modified without the explicit authorization of the Notified Body.

Type of document	Document identification	Rev.	Date (YYYY/MM/DD)
*Design document	CAP-EX-0002	02	2023/04/20
*Safety instructions	MAN-EX-0001	03	2023/04/20
Drawing: Series GTF90/162 – Execution. Ex de.IIC	7014048	06	2019/07/20
Drawing: Series GTF90/162 – Execution “Hot head”	7014026 05	05	2017/12/12
Drawing: Series GTF90/162 – Execution “Cold head”	7014033 05	05	2017/12/12
Drawing: Series GTF90/162 – Execution “Hot head”	7014034 05	05	2017/12/12
Drawing: Series GTF90/162 – Execution “Cold head”	7014037 05	05	2017/12/12
Drawing: Enclosure with radial gasket	7014054 01	01	2017/02/17
Drawing: Enclosure (raw)	7014055 00	00	2010/07/19
Drawing: GTF90/162 – brass plug - execution “Hot head”	7014059 00	00	2011/11/28
Drawing: GTF90/162 – INOX plug - execution “Hot head	7014060 00	00	2011/11/28
Drawing: GTF90/162 – brass plug - execution “Cold head”	7014061 00	00	2011/11/28
Drawing: GTF90/162 – INOX plug - execution “Cold head”	7014062 00	00	2011/11/28
Marking plate - Execution Ex - /d – IIC	7657239 02	02	2017/12/12
Marking plate - Execution Ex e /d IIC	7657238 02	02	2017/12/12
*Drawing: Enclosure’s cover (raw) tall version AISI 316	7014094 01	01	2020/10/21
*Drawing: Enclosure’s cover (machined) tall version AISI 316	7014095 01	01	2020/10/27
Drawing: Enclosure (raw) – AISI 316	7014096 00	00	2015/09/04
Drawing: Enclosure (machined) – AISI 316	7014097 01	01	2017/02/17
*Drawing: Enclosure’s cover (raw) – short version	7014004 03	03	2020/07/20
*Drawing: Enclosure’s cover (machined) – short version	7014006 02	02	2020/10/21
Drawing: Enclosure’s cover (raw) – tall version	7014012 02	02	2020/10/21
Drawing: Enclosure’s cover (machined) – tall version	7014013 02	02	2020/07/27
Drawing: sensitive unit for smooth probe $\Phi$ 10	7040137	00	2019/03/15
Drawing: sensitive unit for smooth probe $\Phi$ 16	7040138	00	2019/03/15

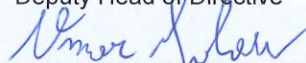
\* New or revised document



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**[20] Terms and conditions**

The product liability rests with the Manufacturer, his representative or, in the absence of a representative, with the importer, in accordance with the General Product Safety Directive 2001/95/EC.

The following conditions may render this certificate invalid:

- changes in the design or construction of the product;
- changes or amendments to the Directive;
- changes or amendments in the standards which form the basis for documenting compliance with the essential requirements of the 2014/34/EU Directive.

**[21] History**

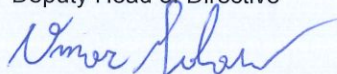
Issue	Description	Date (DD-MM-YYYY)
0	First Emission.	28-05-2018
1	Standard update, further details provided in the specific conditions of use, better identification of surface temperature for dusts, typing error in temperature class tables	20-12-2019
2	Following the IPX6 tests performed on representative samples the equipment is declared in compliance with the requirement IP66 in addition to the requirement IP68 (1m 1hour) already assessed in the past  A pictogram and a warning to refer to instruction manual on the enclosure surface are used to inform about the risk of high temperature surface and to prohibit the opening the enclosure up to it is cooled down	14-07-2023



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End of Certificate