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a bimetal tie rod housed inside the case.

5. Materials

The bulb is made of AISI 316 stainless steel. The case is made of AISI 304 or AISI 316 L stainless steel. Gaskets, vents and filler caps are manufactured in EPDM, VITON or SILICONE RUBBER. The window is manufactured in safety glass. The dial and indicator are manufactured in aluminium.

6. Datasheets

Detailed information about the construction and operating characteristics, as well as drawings showing the overall dimensions are available in the catalogue sheets regarding the TG8 DN100-150 ATEX versions: 2D2, 2D0, 2D5, 2D6 for Gases and dusts and 2G2, 2G0 for Gases.

7. Function

The instrument is intended to be combined to a thermowell and to measure the temperature locally or remotely. **This instrument does not engage any risk of fire when operating normally or when not in use. It should be employed properly preventing any improper use within the established limits as described below.**

8. Intended use limits

Maximum surface temperature – It may be produced by the fluid temperature only. The temperature produced by the combination between the ambient temperature and the process fluid temperature must be below the one intended for the ATEX temperature class, and should not affect the instrument operating functioning.

The process fluid temperature must therefore be kept within the limits indicated in the table below:

Class (Tmax °C)	Pt (°C)
T6 (85°C)	80
T5 (100°C)	95
T4 (135°C)	130
T3 (200°C)	195
T2 (300°C)	290
T1 (450°C)	440

If the values are too high, the installer should insulate the measuring point properly to prevent thermal conduction which may lead to dangerous maximum surface temperatures.

Ambient temperature – This instrument is designed to be used in safe conditions at the following ambient temperatures:

0°C...60°C (2D0 and 2G0 version)
-20°C...60°C (2G2 and 2D2 version)
-53°C...60°C (2D5 version)
-60°C...60°C (2D6 version)
N.B. the bulbs' dimensions may vary according to the ambient temperature as shown on the relevant catalogue sheet.

Nominal temperature range - We recommend choosing a nominal range for your instrument so that the maximum temperature measured is lower than the upper limit intended for the measuring range.

Temperature measuring range - This instrument is designed to measure temperatures that are within the measuring range shown on the dial by two triangular marks, as established by EN 13190 standard.

Over temperature - Must be within the measuring range.

Operating pressure - The 2G2, 2G0, 2D2, 2D0, 2D5 and 2D6 version of the inert gas filled TG8 thermometer is designed to work combined with a thermowell. Therefore, the catalogue sheet concerning the thermowell should be checked to determine the maximum pressure it can be subjected to.

Ambient pressure - This instrument is designed to work at an atmospheric pressure ranging between 0,8 and 1,1 bar A.

Protection level - In compliance with CEI EN 60529 standard referring to hermetically sealed ring conditions, with built-in caps that should be located in the right position. Values shown in the table:

Version	IP rating (instrument case)
2G2, 2G0	IP 55 (dry)
2D2	IP 65/67 (dry) (filled)
2D0, 2D6	IP 65/67 (filled)
2D5	IP 65/67 (vented)

Liquid filled cases - Liquid filling is generally used to dampen vibrations on moving parts. In order to prevent the damping liquid leaking from the case, the instruments are made and delivered sealed. When oxidants are involved, a chemical reaction may occur engaging the ignition or explosion of the instrument. Particular care must be taken in selecting the filling liquid as far as the ambient temperature is concerned according to the table below:

Filling liquid	Ambient temperature
Glycerine 98%	0°C...60°C
Silicone oil	-20°C...60°C
Low temperature silicone oil	-60°C...60°C
Fluorurate fluid	-20°C...60°C

9. Improper use

The following applications may be potentially dangerous and must be considered attentively:

Vibration failure - The most common vibration failure takes place when the movement parts wear out because of high cyclic loading produced by vibrations. The result may be a gradual loss of accuracy and, eventually, a failure of the pointer which may not display a change in pressure.

Failure for over temperature - When an over temperature exceeding the maximum limit or that it is below the minimum limit intended for the sensing bulb is applied, a failure may occur affecting the instrument operating activity permanently.

10. Transport

Instruments may be affected during transport, despite an adequate packaging. Therefore, a check before use is advisable.

11. Storage

Instruments should stay in their original standard package until installation and stored in dry, indoor spaces. If instruments are supplied with special packaging (in wooden boxes lined with tar paper or in barrier bags), it is always advisable to keep them indoor, and always protected from the atmospheric agents. The condition of the packaging material must be checked every 3-4 months, especially if packages are exposed to the atmospheric agents. The storage area temperature should range between -20 and +65 °C, unless otherwise specified in the catalogue data sheets.

12. Installation

T series thermometers 2G2, 2G0, 2D2, 2D0, 2D5 and 2D6 versions must be installed according to the requirements of European Standards EN13190.

Install the instrument in a position in which the magnetic and electromagnetic induction, ion radiation, ultrasound and exposure to sunlight do not increase the instrument surface temperature.

It is advisable to install a thermowell between the thermometer and the system to remove the instrument for maintenance more easily, without affecting the entire system. The thermometer must be fastened to the thermowell until obtaining a watertight seal. The case must not be tightened as this may damage the instrument.

Instruments should be installed in a vertical position so that the dial stays vertical, unless otherwise indicated on the tag. The thermometer's bulb should be long enough to allow the sensing element to be connected to the environment to measure the ambient temperature. When mounted on pipes, the sensing element should be installed right on the central axis of the pipe.

Direct installation - The temperature around the case should not exceed 60°C. For this reason the bulb should be long enough to keep the case at a correct distance from the process. Otherwise, the instrument should be installed horizontally.

Distance of the case or pipe (mm)	Pt (°C)
50	80
75	95
100	130
150	195
200	290
250	440

Remote installation - When vibrations and high or low temperatures are involved, it is advisable to install a thermometer provided with a capillary connection between the case and the bulb. In this case too, the case should not be exposed to the process heat. The temperature indication may be delayed by the capillary in proportion to its length. The minimum diameter of bends is 30 cm.

Mechanical stress - These instruments should not receive mechanical stress.

- Instruments should be provided with anchors to mount them to the wall, panels or control panels, and with a capillary extension.

Vibrations - When the pressure gauge support receives vibrations, different solutions may be considered, such as:

- the use of liquid-filled gauges and process connection threading > 1/2"
- if the vibrations are strong or irregular, instruments should be mounted remotely and connected by a capillary.

When vibrations occur, the pointer moves continuously producing irregular fluctuations.

Equipotentiality - The instrument is made equipotential with the plant when it is fitted on it by means of an Ohmic contact between the threaded connections and the plant. **This last one must be metallic and connected to the ground.**

13. Accessories

Thermowells - These devices are necessary to install thermometers properly. They protect the case from corrosion, from overpressures, from high-velocity and/or flammable liquids. When high temperatures are involved, an extension may be required to allow the heat to dissipate and to insulate the instrument from the process. This procedure may delay the response time that can be shortened by filling the thermowell with a heat transmission fluid (oil, graphite powder), chemically compatible with the process and the ATEX atmosphere.

14. Use

The user must be aware of the risks related to the chemical and physical characteristics of the gases, vapors, and/or

powders in the system.

Caps - The filling and vent caps must not be removed while the system is operating.

15. Disfunction

- **Steady indication on the same value:** the Sensing element is broken.
- **Steady indication outside the graduated scale:** Overpressure - temporary or permanent reading error.
- **Overpressure error exceeds the one declared for the instrument:** Calibration altered. Delay in temperature transmission.
- **Ejection of the safety cap:** Excess temperature in the process fluid or ambient temperature too high.

16. Maintenance

The original mechanical and construction characteristics must be maintained by a specific maintenance program, drawn up and managed by qualified technicians. Mechanical parts must be maintained in such a way as to prevent risks linked to high temperatures, and the risk of fire and explosion due to malfunctioning.

The sensing element should be checked every 3/6 months, as well as the accuracy of indication, the filling fluid level and/or the presence of condensate inside the case. If the instrument does not work properly, an extra check must be carried out.

General check - During checking procedure, instruments must be isolated from the plant, disassembled, and calibrated. **A check of the gaskets condition and the subsequent IP protection level is recommended.**

Recalibration - If the calibration check produces values that are different from the nominal values indicated in the catalogue, the instrument must be recalibrated. We recommend returning the instrument to NUOVA FIMA for recalibration using the **Product Return Service**.

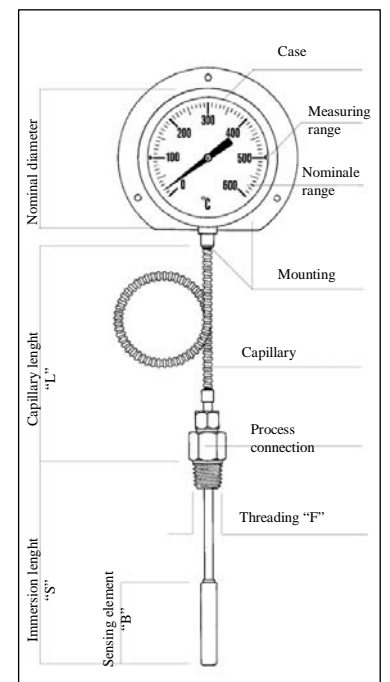


Cleaning - Dust deposits on the instrument should not be thicker than 5mm otherwise they must be removed and the instrument cleaned by means of a cloth soaked in a water and soap solution.

NUOVA FIMA will not be responsible for all non-authorized intervention on the instrument. In case of non-authorized modification of the instrument the contract warranty and the CE Conformity Declaration is no longer valid.

17. Disposal

We recommend removing window and caps and disposing of them as aluminum and stainless steel.



1. Safety

The safest ambient conditions for the instrument to operate properly depend on the correct selection and installation of it in the system, as well as on the compliance with the maintenance procedures set out by the manufacturer. The user is entirely responsible for a correct installation and maintenance.

This manual is supplied with the instrument and should be properly stored. It is advisable to read it carefully before using the instrument.

In order to specify the functional and constructive characteristics of the instruments, it is recommended consulting the most updated version of the catalogue and data sheets which are available on the website www.nuovafima.com



An improper use may damage the instrument and the operator or the entire plant.

The operators responsible for the selection, installation and maintenance of the instrument should be aware of the environmental conditions that may negatively affect the instrument operational activity and which may lead to its premature failure. Therefore, only technically qualified and trained staff should carry out the procedures established by the plant regulations.

2. Directives

T series thermometers, installed using a thermometric sheath conform to the Essential Health and Safety Requirements laid down in European Directive 2014/34/EU for Group II, Category 2G or 2GD equipment in the T6...T1 temperature class.

VERSION	MARKING
2G2 (gases)	CE Ex II 2G Ex h IIC T6...T1 Gb -20°C ≤ Ta ≤ 60°C
2G0 (gases)	CE Ex II 2G Ex h IIC T6...T1 Gb 0°C ≤ Ta ≤ 60°C
2D2 (gases and dusts)	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db -20°C ≤ Ta ≤ 60°C
2D0 (gases and dusts)	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db 0°C ≤ Ta ≤ 60°C
2D5 (gases and dusts)	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db -53°C ≤ Ta ≤ 60°C
2D6 (gases and dusts)	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db -60°C ≤ Ta ≤ 60°C

This instrument is NOT suitable for ZONES 0 and 20.

EMC Directive 2014/30/EU on electromagnetic compatibility (EMC) does not apply to this product.

In terms of Directive 2014/68/EU (P.E.D.) NUOVA FIMA thermometers must be designed and manufactured according to a "Correct Construction Practice" (SEP - Sound Engineering Practice)

3. Standards

NUOVA FIMA instruments are designed and constructed to comply with the safety requirements required by the international regulations in force some of which are reported in this manual. In order to perform installation and commissioning of the instruments concerned, it is necessary to know and to comply fully with the following standards: EN 13190, EN 1127-1, UNI CEI EN ISO 80079-36, UNI CEI EN ISO 80079-37. All instruments must be calibrated with reference to national and/or international samples according to the regulations established by the UNI EN ISO 9001:2015 quality management system.

4. Operating principle

The system is composed by a thermometric bulb, a transmission system, and a spiral Bourdon spring, housed in the instrument's case. The system is pressurized by means of inert gas. Fluctuations in temperature may change the system pressure so that the spiral spring moves transmitting the movement to the pointer. Any ambient temperature fluctuation that could affect the accuracy is compensated for by means of

DICHIARAZIONE UE DI CONFORMITÀ EU DECLARATION OF CONFORMITY Direttiva 2014/34/UE - Directive 2014/34/EU

Apparecchi e sistemi di protezione destinati ad essere utilizzati in atmosfera potenzialmente esplosiva
Equipment and protective systems intended for use in potentially explosive atmospheres.

NUOVA FIMA s.r.l. dichiara sotto la propria responsabilità che i termometri in esecuzione 2G2, 2G0, 2D2, 2D0, 2D5 e 2D6 di seguito elencati sono in accordo con la direttiva.

NUOVA FIMA s.r.l. declares on its sole responsibility that the following thermometers 2G2, 2G0, 2D2, 2D0, 2D5 and 2D6 version comply with the above-mentioned directive.

Modello Model	Installazione Mounting	DN DS	Campo Range	Tipo custodia Case type	Versione Version	Marcatura Marking
TB8	/	100	Tutti All	Secco IP 55 Dry IP55	2G2	CE Ex II 2G Ex h IIC T6...T1 Gb -20°C ≤ Ta ≤ 60°C
TG8	Locale Local	125*				
	150					
TG8	A distanza Remote	100	Tutti All	Secco IP 55 Dry IP55	2G0	CE Ex II 2G Ex h IIC T6...T1 Gb 0°C ≤ Ta ≤ 60°C
	150					
TB8	/	100	250°C max	Riempita Filled	2D2	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db -20°C ≤ Ta ≤ 60°C
TG8	Locale Local	125*				
	150					
TG8	A distanza Remote	100	Tutti All			
	150					
TB8	/	100	Tutti All	Secco IP65/67 Dry IP65/67	2D0	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db 0°C ≤ Ta ≤ 60°C
TG8	Locale e a distanza Local and remote	125*				
	150					
TB8	/	100	160°C max	Riempita Filled	2D0	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db 0°C ≤ Ta ≤ 60°C
TG8	Locale Local	125*	160°C max			
	150					
TG8	A distanza Remote	100	Tutti All			
	150					
TB8	/	100	Tutti All	Ventilata Vented	2D5	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db -53°C ≤ Ta ≤ 60°C
TG8	Locale e a distanza Local and remote	125*				
	150					
TB8	/	100	250°C max	Riempita Filled	2D6	CE Ex II 2G Ex h IIC T6...T1 Gb II 2D Ex h IIC T85°C...T450°C Db -60°C ≤ Ta ≤ 60°C
TG8	Locale Local	125*				
	150					
TG8	A distanza Remote	100	Tutti All			
	150					

*DN125 solo per modello TB8

*DS125 only for TB8 model

Norme di riferimento - Reference standards

EN 1127-1:2019, UNI CEI EN ISO 80079-36:2016, UNI CEI EN ISO 80079-37:2016

Il fascicolo tecnico è depositato presso l'Organismo Notificato:

The technical file is retained at the following Notified Body:

ICIM - 0425

Il fascicolo tecnico è denominato:

The technical file is named:

TF3 (2016 ATEX 2909)

La revisione e la data di revisione sono:

The revision number and the revision date are:

Rev.2 del 11/01/2021

Il controllo della fabbricazione interna degli strumenti è assicurato dal Sistema Qualità secondo ISO

9001:2015 operante in azienda e certificato da ICIM SpA.

The control of internal manufacturing of the instruments is assured by the Quality System according to ISO

9001:2015 of the factory, certified by ICIM SpA.

Invorio, 29/01/2021

NUOVA FIMA

Responsabile ATEX-ATEX Responsible

F. Zaveri

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Data di emissione 29/01/2021

Edizione 6

Rilasciato da resp. ATEX F. Zaveri