

Talentum I 6000  
Flameproof (Ex d)  
Flame Detector

## Installation Guide



EN

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# Contents

- 1. General ..... 3
  - Applicable models ..... 3
  - Description ..... 3
  - Health and Safety at Work Act ..... 3
- 2. Introduction to Flameproof Enclosures ..... 4
- 3. Classification of Hazardous Areas ..... 5
- 4. Equipment Markings ..... 6
  - ATEX ..... 6
  - CENELEC / IEC ..... 7
- 5. Flameproof Products ..... 9
- 6. System Design ..... 10
  - Selection of Cable Glands ..... 10
- 7. Installation ..... 11
- 8. Enclosure Details ..... 13
- 9. Service and Repairs ..... 14
- 10. Technical Data ..... 15

*Information in this guide is given in good faith, but the manufacturer cannot be held responsible for any omissions or errors. The company reserves the right to change the specifications of products at any time and without prior notice.*

# I. General

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## Applicable models

This Installation Guide covers the following Talentum I 6000-series Flame Detectors:

- I 65 I I Conventional IR2 Ex d Flame Detector
- I 65 I 9 Conventional IR3 Ex d Flame Detector

## Description

This Installation Guide gives information on the Flameproof (Ex d) version of the flame detectors that have been approved by SGS Baseefa. The requirements of European Union Directive 2014/34/EU (the 'ATmosphères EXplosibles' or ATEX Directive) have been met. The approval has been assessed to the following European standards: EN 60079-0, EN 60079-1 and EN 60079-31. The flame detectors have also been assessed and approved to IECEx requirements.

The detector enclosure is certified category

Ex II 2 G D,      Ex db IIC T4 Gb  
Ex tb IIIC T135°C Db  
Tamb = -40°C to +85°C

This guide provides information on flameproof (type 'd') enclosures and the application, maintenance, installation and adjustment of the detectors. Reference to other individual detector publications can be made for more information on non-flameproof issues. These publications are available on request.

## Health and Safety at Work Act

In the UK, all equipment must be installed and disposed of (as required) within the legislative requirements of the Health & Safety at Work Act 1974.

## 2. Introduction to Flameproof Enclosures

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There are many places where an explosive mixture of air and gas or vapour is or may be present, intermittently or as a result of an accident. These are defined as hazardous areas by EN 60079-0, "Explosive atmospheres, Part 0: Equipment – General requirements".

Hazardous areas are common in petroleum and chemical engineering plants and in factories processing and storing gases, solvents, paints and other volatile substances.

Electrical equipment for use in these areas needs to be designed so that it cannot ignite an explosive mixture, not only in normal operation but also during fault conditions. There are a number of methods available to achieve this – oil immersion, pressurised apparatus and powder filling, for example, but the two most commonly used are intrinsic safety and flameproof enclosures.

Flameproof equipment is contained in a box so strong that an internal explosion will neither damage the box nor be transmitted outside the box. The surface must remain cool enough not to ignite the explosive mixture.

When flameproof equipment is interconnected, flameproof wiring must be used. This method is helpful for installations in areas where explosive gas/air mixtures are not present continuously or not present for long periods.

### 3. Classification of Hazardous Areas

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EN 60079-0 states that electrical equipment for potentially explosive atmospheres is divided into:

- Group I: Equipment of Group I is intended for use in mines susceptible to firedamp.
- Group II: Equipment of Group II is intended for use in areas with an explosive gas atmosphere other than mines susceptible to firedamp.
- Group III: Equipment of Group III is intended for use in areas with an explosive dust atmosphere other than mines susceptible to firedamp.

These flame detectors are designed to meet the requirements of Group II. For the type of protection “d” Flameproof, Group II is subdivided into Equipment Categories, Type of Explosive Atmosphere (Table 1), Type of Protection Code (Table 2), Temperature Class (Table 3) and Gas Group (Table 4).

## 4. Equipment Markings

**ATEX** (EU Directive 2014/34/EU)



- I   CE Marking & Notified Body Number
- II   Indicates Explosion Protection Equipment
- III   Group II
- IV   Equipment Category – See Table I
- V   Zone: Gas – See Table I
- VI   Zone: Dust – See Table I

| Equipment Category                                                                                                                                             | Definition – ATEX Equipment Group II                                                                                                                               | Zone    |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|
|                                                                                                                                                                |                                                                                                                                                                    | G - gas | D - dust |
| I                                                                                                                                                              | Very high level of protection<br><br>A place in which an explosive atmosphere is continually present, or present for long periods of time.                         | 0       | 20       |
| 2                                                                                                                                                              | High level of protection<br><br>A place in which an explosive atmosphere is likely to occur.                                                                       | I       | 21       |
| 3                                                                                                                                                              | Normal level of protection<br><br>A place in which an explosive atmosphere is unlikely to occur, and if it does occur, will exist only for a short period of time. | 2       | 22       |
| These flame detectors are suitable for equipment categories 2 and 3, G or D.<br>Note: The detectors are not certified for category I areas, see 'IS' products. |                                                                                                                                                                    |         |          |

**Table I.** Equipment categories and type of explosive atmosphere (Group II)

# Ex db IIC T4 Gb

I      II      III      IV      V

| Code                                    | Type of Protection Code | Equipment Category |
|-----------------------------------------|-------------------------|--------------------|
| ia                                      | Intrinsic safety        | I                  |
| ib                                      | Intrinsic safety        | 2                  |
| d                                       | Flameproof              | 2                  |
| These flame detectors are approved 'd'. |                         |                    |

Table 2. Type of protection codes

- I Explosion Protection Symbol
- II Type of Protection Codes – See Table 2
- III Gas Group – See Table 4

| Temperature Class<br>Referred to ambient of<br>-20°C to +40°C | Maximum Surface Temperature |
|---------------------------------------------------------------|-----------------------------|
| T6                                                            | 85°C                        |
| T5                                                            | 100°C                       |
| T4                                                            | 135°C                       |
| T3                                                            | 200°C                       |
| T2                                                            | 300°C                       |
| T1                                                            | 450°C                       |
| These flame detectors are approved to T4.                     |                             |

Table 3. Temperature classification

- IV Temperature Classification – See Table 3
- V Equipment Protection Level (EPL) – Suitable for Zones 1 and 2 [See EN60079-26]

| Gas Group                                                                                                                                                               | Repre-<br>sentative Gas | Other Gases, Liquids, Vapours                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------|
| IIC                                                                                                                                                                     | Hydrogen                | Acetylene, Carbon Disulphide                  |
| IIB                                                                                                                                                                     | Ethylene                | Diethyl ether, Tetrafluoroethylene            |
| IIA                                                                                                                                                                     | Methane                 | Butane, Methanol, Petroleum, Propane, Styrene |
| These flame detectors are approved IIC for listed gases in EN 60079-0. Equipment marked as IIC is suitable for applications requiring Group IIA or Group IIB equipment. |                         |                                               |

Table 4. Subdivisions of Group II gases

# Ex tb IIIC T135°C Db



- I Explosion Protection Symbol
- II Dust Protection by Enclosure [See EN61241-1]
- III Subdivisions of Group III Dusts – See Table 5
- IV Maximum External Surface Temperature
- V Equipment Protection Level (EPL) – Suitable for Zones 21 and 22 [See EN60079-26]

| Dust Group                                                                                       |                     |
|--------------------------------------------------------------------------------------------------|---------------------|
| IIIC                                                                                             | Conductive Dust     |
| IIIB                                                                                             | Non-conductive Dust |
| IIIA                                                                                             | Combustible Flyings |
| Equipment marked IIIC is suitable for applications requiring Group IIIA or Group IIIB equipment. |                     |

Table 5. Subdivisions of Group III dusts

## 5. Flameproof Products

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The flame detectors respond to light emitted from flames during combustion.

The detectors discriminate between flames and other light sources by responding only to low frequency flickering produced by flames (typically 1 to 15 Hz). The detectors ignore fixed light sources and rapidly flickering illumination predominantly produced by lighting.

The flame flicker techniques have the advantage of still allowing the detection of flames through a thin layer of oil, water vapour, ice or dust. This makes these detectors particularly useful in industrial applications.

Full details of the principles of operation, electrical description, and other detailed technical data are published in the product's individual data sheet and User Guide.

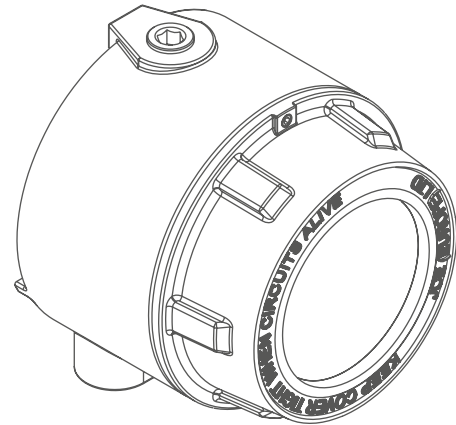


Figure 1. Flameproof flame detector (alloy housing)

## 6. System Design

Only engineers familiar with codes of practice for hazardous area systems should undertake the design of a flameproof fire detection system. In Europe the standard is EN 60079-0, “Explosive atmospheres, Part 0: Equipment – General requirements”.

The SGS Baseefa certification of the flameproof device enclosure covers their characteristics as components of a flameproof system.

### Selection of Cable Glands

Table 6 gives examples of the application of barrier glands certified and approved to meet EN 60079-14 for thermoplastic, thermosetting and elastomeric cables.

| Example | Hazardous Area Type                                        | Gland Method                  |
|---------|------------------------------------------------------------|-------------------------------|
| 1       | Zone 1, 2, 21 & 22 Hazardous areas requiring IIC apparatus | Ex d barrier glands mandatory |
| 2       | Zone 2 & 22 Hazardous areas requiring IIA & IIB apparatus  | Any Ex d gland permitted      |

Table 6. Examples of barrier glands

## 7. Installation

No modification should be made to the enclosure without reference to the manufacturer, as unauthorised modification to an approved enclosure will invalidate the certificate/approval.

1. The enclosures are supplied with drilled and tapped entries. See enclosure drawing (Figure 4).
2. The surface of the machined/threaded flame paths between cover and body must be protected from scratches or damage during installation. Any such damage can destroy the validity of the enclosure.
3. Before the cover is refitted, the flame path/threaded joint between cover and body must be thoroughly wiped clean of dirt, grit or other foreign substances, and then a thin coating of an approved form of non-setting grease applied to joint/threads. Ensure the gasket O-ring is free from damage.
4. Threaded covers must be screwed on to a minimum of five full threads of engagement and then locked in position with the locking screw provided.
5. All tapped entries must be fitted with an approved flameproof (Ex d) device which is equivalent or superior to the gas group and temperature of the enclosure.
6. The enclosure should be mounted using the two rear M6 tapped holes. To prevent damage to the enclosure, the mounting screw thread must not penetrate the fixing hole by more than 8 mm.
7. Do not scratch the glass.
8. Glanding of cables should be as in the Selection of Cable Glands section on page 10. To maintain the IP66 rating of the product, cable glands of IP66 rating or higher must be used.

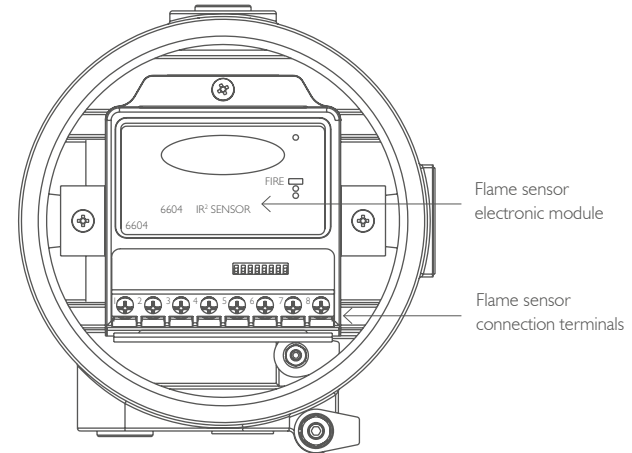
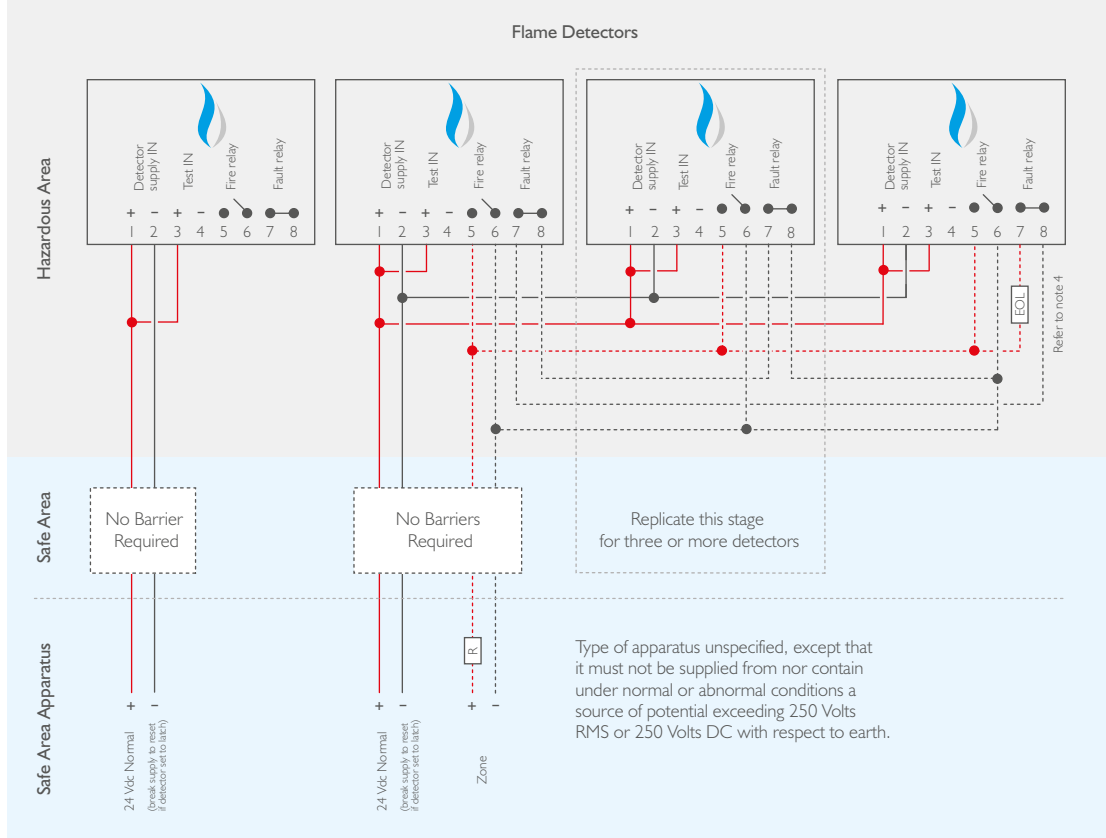


Figure 2. Enclosure with front cover removed



## NOTES:

1. WARNING – Ensure ALL power is OFF before/during installation/maintenance.
2. Ensure the details on the enclosure label comply with the hazardous area specified.
3. The installation must comply with national installation requirements (for example, EN 60079-14).
4. If required, a loading resistor or end of line (EOL) device can be connected between the detector terminals of any circuit. The total power dissipation and temperature classes within the enclosure must not be exceeded (30 W, T4).
5. The 24 Vdc supply line to the detectors should be fused at 1 A.

Figure 3. Ex d system connection diagram

# 8. Enclosure Details

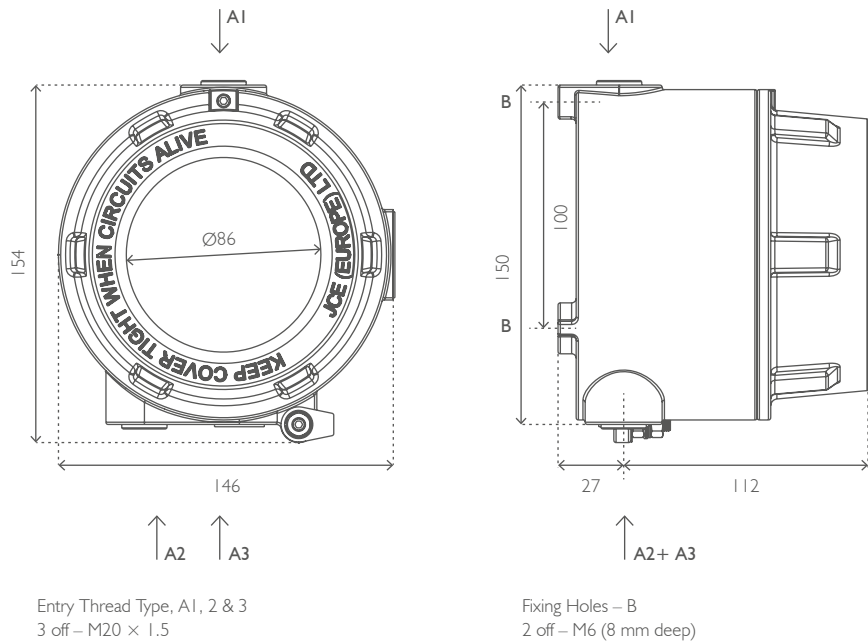


Figure 4. Flameproof flame detector enclosure details (dimensions in mm)

## 9. Service and Repairs

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1. Frequent inspections should be made. A schedule for the maintenance check should be determined by the environment and frequency of use but should be regular enough to ensure the detector continues to operate in the designed manner. It is recommended that it should be at least once a year.
2. External surfaces of the enclosure should be periodically cleaned to ensure dust deposits are not allowed to accumulate.
3. Check the flame path/threads on the enclosure body and lid for signs of corrosion. If badly pitted, replace the component.
4. All components that are replaced must be in accordance with the manufacturer's specification. Failure to use such components may invalidate the certification/approval on the enclosure and may make the enclosure dangerous.
5. After inspection and maintenance have been carried out, items 3 and 4 of the installation instructions (see page 11) should be adhered to when resealing the enclosure.

Servicing of the fire protection system should be carried out as recommended by the local regulations in force.

## 10. Technical Data

| Mechanical                          |                                                     |
|-------------------------------------|-----------------------------------------------------|
| Housing Material                    | Copper-Free Aluminium Alloy LM25                    |
| Housing Colour                      | Red                                                 |
| Housing Dimension (Excluding Mount) | Height = 150 mm<br>Width = 146 mm<br>Depth = 139 mm |
| Cable Gland Entries                 | 3 × 20 mm                                           |

| Electrical             |                        |
|------------------------|------------------------|
| Supply In:             |                        |
| Voltage                | 14 to 30 Vdc           |
| Current                | 2 to 28 mA             |
| Self-Test Input:       |                        |
| Voltage                | 14 to 30 Vdc           |
| Current                | 40 $\mu$ A typ. @ 24 V |
| Relay Contact Ratings: |                        |
| Voltage                | 48 Vdc                 |
| Current                | 0.75 A                 |
| Power                  | 30 W                   |
| Resistive Loads Only   |                        |

| Environmental                 |                                                                 |
|-------------------------------|-----------------------------------------------------------------|
| ATEX Approval                 | Ⓔ II 2 G D<br>T <sub>amb</sub> -40°C to +85°C                   |
| CENELEC / IEC Approval        | Ex db IIC T4 Gb<br>Ex tb IIIC T135°C Db<br>(Zone 1, 21, 2 & 22) |
| Apparatus Certificate Numbers | Baseefa08ATEX0270<br>IECEx BAS08.0073                           |
| IP Rating                     | IP66                                                            |

Refer to detector data sheet and User Guide for further details