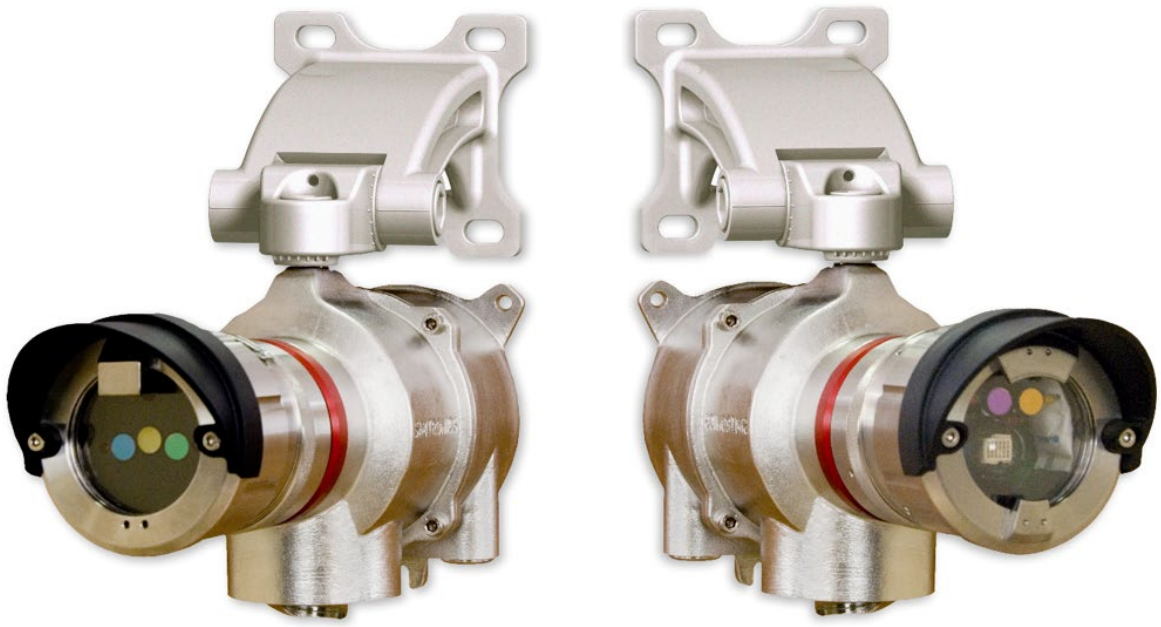
TELEDYNE
OLDHAM SIMTRONICS
Everywhereyoulook™

OPERATING MANUAL

MULTIFLAME DF-TV7

OPTICAL FLAME DETECTOR



DF-TV7-T Multi-spectrum IR

DF-TV7-V Combined UV/IR

(with Magnetic interface)

NOSP17662-Revision 04b

User Manuals in other languages are available on Website https://teledynegasandflamedetection.com

All of the information that is provided in this document is accurate to the best of our knowledge.

As a result of continuous research and development, the specifications of this product may be changed without prior notice.

TELEDYNE OLDHAM SIMTRONICS S.A.S.

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Important Information

The modification of the material and the use of parts of an unspecified origin shall entail the cancellation of any form of warranty.

The use of the unit has been projected for the applications specified in the technical characteristics. Exceeding the indicated values cannot in any case be authorized.

TELEDYNE OLDHAM SIMTRONICS recommends regular testing of fixed gas detection installations (read Chapter 7).

Warranty

Under normal conditions of use and on return to the factory, DF-TV7 flame detectors carry a 3-year warranty on IR models and 2 years on combined UV/2IR models, excluding accessories such as tilt mount, weather protection, etc.

Waste Electrical and Electronic Equipment (WEEE directive)

European Union (and EEA) only. This symbol indicates that, in conformity with directive DEEE (2002/96/CE) and according to local regulations, this product may not be discarded together with household waste.

It must be disposed of in a collection area that is set aside for this purpose, for example at a site that is officially designated for the recycling of electrical and electronic equipment (EEE) or a point of exchange for authorized products in the event of the acquisition of a new product of the same type as before.

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1 Product Description

MultiFlame DF-TV7-T was designed to detect hydrocarbon fires, while minimizing false alarms. This detector is equipped with an intelligent optical self-test. It is certified and may be installed in SIL2 level system. It can be directly connected to a wide range of traditional or fire controllers and on Programmable Logic Controllers (PLC).

DF-TV7-T can be fully configured using the portable communication terminal (TLU600), providing flexibility to the user. Time delay, sensitivity and outputs configuration can be full set up via the TLU600, a hazardous area approved remote control. Optical and electronic parts, and outputs (current, relay...) of the detector can be controlled by the TLU. The DF-TV7-T can be configured too by the HART communication terminal, TLH710 or TLH720 (in option).

Concerning to the Type-D detector, some operations can be done with the magnetic wand (CEDPC led, flame simulation, LT15 test)

The MultiFlame product family consists of two detector versions:

- DF-TV7-T multi-spectrum IR Flame detector
- DF-TV7-V combined UV and IR

The MultiFlame models are also available for use in an addressable network system with distributed intelligence SYNTEL. This version is named DF-RV7-*. For more information, please refer to the Syntel module interface operating manual.

1.1 Applications

- Refineries
- Drilling and Production Platforms
- FPSO
- Fuel Loading Facilities
- Compressor Stations
- LNG/LPG Processing and Storage
- Gas Turbines
- Chemical Plants
- Aircraft Hangars
- Sports (Stadia / Gymnasia)

The sensitivity of flame detector depends on many factors including, fuel type, fire size, atmospheric conditions (wind, rain, fog, etc...), the angle between the fire and detector as well as line of sight obstructions.

1.2 DF-TV7-T: multi-spectrum IR

The DF-TV7-T is a multi-spectrum flame detector using three individual infrared wavelengths. The use of three different IR bands and a unique signal processing algorithm allows excellent flame detection performances, while offering a very low rate of false alarms.

The detector can be supplied with a configurable cartridge:

- A "standard range" sensor cartridge covering most applications
- A "high sensitivity" sensor cartridge for special applications where the maximum sensitivity is required.

1.3 DF-TV7-V: combined UV and IR

Designed to cover a large detection range while ensuring excellent immunity against false alarms, the DF-TV7-V is the alternative when multi-spectrum IR cannot be used.

False alarms are minimized using two infrared wavelengths plus a fast-acting UV wavelength to confirm detection. This version is useful in difficult environmental conditions, such as combined rain and wind, rapid sunshine variations, hot sources modulations, industrial lighting etc.

The DF-TV7-V is also configurable for special applications, where using just dual IR or just direct UV detection is required.

The UV detector can be sensitive to UV welding radiation or lightning, X rays and gamma rays.

1.4 Technical specifications

Each detector is constructed as follows:

- A wall-mounted support secured by three screws and including cable gland (M20) (optional). There are 2 standard entries and an optional one.
- A stainless steel (316L) explosion-proof housing containing a set of tropicalized electronic cards
- The sensor cartridge contains the flame detection circuitry. So, it is possible to change the cartridge easily. The multi-spectrum IR detector is also available in a high sensitivity version.
- An IR communication head is located below the detector housing. It is used for communication with the maintenance hand-held terminal (TLU).
- A metallic support cable (optional) connects the wall mounting support and the housing, making the maintenance easier.

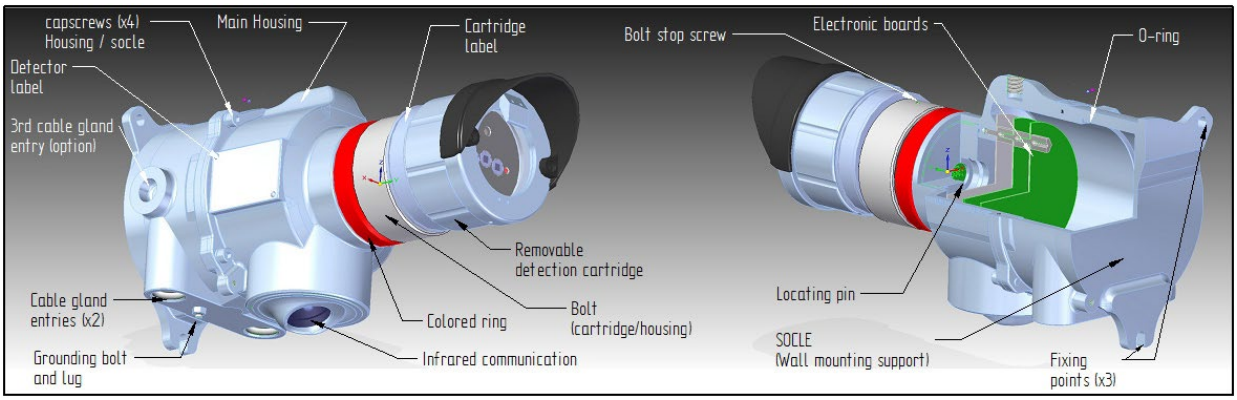


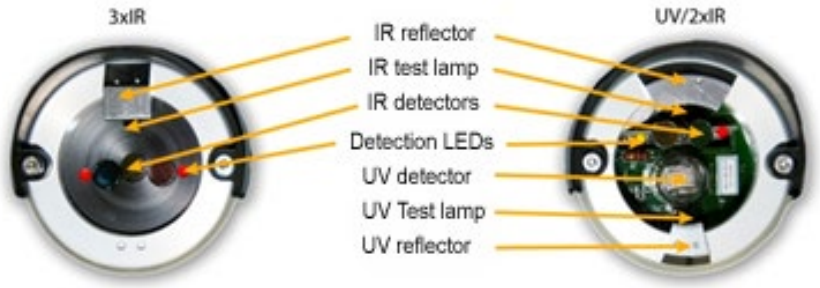
Figure 1 : Detector presentation

(Overall dimension drawings, see Figure 2)

1.5 Detection Cartridge

Cartridges are explosion proof designed. They are common to all MultiFlame line of products in order to reduce spares parts.

- DF-RV7-T and DF-RV7-V: Network "Telecaptor" flame detector line,
- DF-TV7-T and DF-TV7-V: "Telecaptor" flame detector line.



When in fire alarm mode, the red LED located in the communication head and the two LEDs located in front of the detection cartridge are blinking. Information and detector status is also available via the remote control TLU 600 / TLH710 or TLH720 display.

The cartridge must not be removed when the detector is powered.

1.6 Optical self-test function

Sensor cartridges have one or more self-test optical lamps allowing detection integrity test. This is a full optical test where the signal from each test lamp is transmitted through the sensor window and reflected back to the detecting elements via a polished stainless-steel reflector.

In addition to this cyclic self-test, the test lamps can be used when a "flame simulation test" is initiated by the maintenance terminal. Further testing is not required to confirm correct operation.

As part of the continuous improvement of our products, we are gradually implementing a new source of IR self-test whose reliability and repeatability are reinforced to the current version. However, you will notice that the signal is now invisible to the eye, all the energy dissipated is limited to the useful infrared band. It is therefore no longer possible to distinguish the lamp illumination from the correct operation of the measurement chain.
It should be noted that a malfunction of one of them is extremely improbable. Indeed, the lifetime expected for this source is much longer than 5 years.

1.7 Communication Interface

1.7.1 Wireless Configuration Tool

Information and status of the detector are available via the wireless configuration tool TLU600.

Configuration and tests are performed using this wireless configuration tool (IrDA protocol). This tool is common for all TELEDYNE OLDHAM SIMTRONICS MultiFlame, MultiXplo and MultiTox products.

The TLU600 provides access to devices which, otherwise, would require major logistic operations for maintenance or for configuration (calibration ...).

For more details, please refer to the wireless configuration tool operating manual.

1.7.2 Magnetic wand

The Type-D electronic version includes two magnetic sensors PG1 and PG2 implanted on the numeric card.

The communication interface is a magnetic wand.The wand can be used only to acess to the following functions :

- Alarms acknolodwment
- CEDP led
- Flame simulation
- LT15 mode

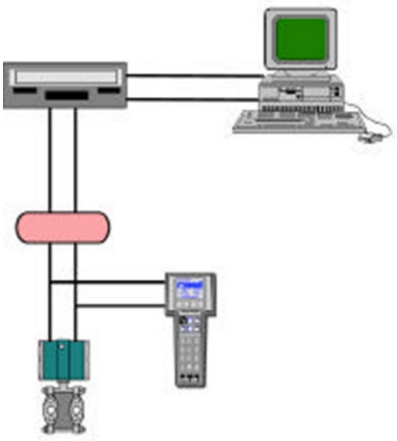
1.7.3 HART communication

The HART communication authorizes an addressing of devices, allowing the communication in read/write mode.

It consists in getting connection on the current loop on which the numerical data are superimposed.

Most of the HART terminal can read this information and send commands

The use of a DD (Device Descriptor) facilitates the interface Man-Device. It can be uploaded on our website.



HART protocol is optional. Read the P/N on your detector and check it contains the letter 'H' at the 12th position for HART compatibility. P/N: **DF**-TV7-****-**H-**-***-*-*-*

TELEDYNE OLDHAM SIMTRONICS devices under HART protocol enable the use of all the functions available with the TLU600 via the HART terminal

Read document P/N D2205001 for Hart Terminal TLH710 or TLH720 operation (Device Descriptor file must be downloaded).

1.8 Product Code

Product codes are created from functional codes: DF-ξV7-X#σ0-0αβ-0ρ-00ε-μ-ϕ-0

ξ	V	6 7	XV XT	σ	-0	α	β	-0	ρ	-00ε	-μ	-ϕ	-0

C**	Compact capteur	
T**	Télécapteur	
R**	Capteur réseau / Network version	
	Famille / Families	
	V	Flamme / Flame
	Génération	
	**6	BT606 Boitier / housing
	**7	BT10 Boitier / housing
	Type Flamme	
	XV	UVIR²
	XT	IR3
	XW	UV
σ0	**Portée de détection**	
	A0	Portée standard / Standard range
	B0	Longue Portée (Version XT uniquement) / Long range (only XT versions)
0	**Type**	
	0**	Non utilisé ou flamme / not used or flame
α	**Variante**	
	A	Aluminium
	X	SS316L
β	**Interface**	
	**A	Protocole 0-22mA (Défaut sur le 0-4 mA/ fault on range 0-4mA)
	**E	Protocole 4-20 mA (Défaut commun / Common fault signal : 2 mA)
	**H	4 – 20 mA / 0-22 mA configurable & protocole HART
	**C	4 – 20 mA / 0-22 mA configurable
	**L	LON
0	**Cartouches**	
	0*	Cartouche flamme / flame cartridge
ρ	**configurations. spéciales**	
	*0	Standard
	*M	Version spéciale MarED (TX6 et TV6 type A uniquement)
	*N	Version spéciale AL LED non mémorisée (Non conforme EN 54-10) (flamme uniquement)
	*1	Customisation EPR (suivi spécial – SP4M20) (DM et DMi uniquement)
0εε	**Configuration**	
	000	Standard
	**A	Exempt de toute trace de graisse / grease free
	**B	Version spéciale MarED (ancien code) (TX6 et TV6 type A uniquement)
	**C	Version non EN 54-10 (ALRM non mémo) (type A uniquement)
	**F	Certified Telecaptor instead of IRDA cap
	**G	Peinture hydrocentrifugon (applications nucléaire) / Hydrocentrifugon paint (nuclear applications)
	**H	Peinture light grey (10A03 selon « British standards 4800/5252 »)
	**J	Peinture spéciale : RAL 3001 (Rouge)
	L	Epaisseur peinture >200 µm (version ATEX IIB)
μ	**Langue / Language**	
	0	Fr / GB
	F	Français / French
	E	Anglais / English
	P	Portugais / Portuguese
	C	Chinois / Chinese
ϕ	**Hardware version**	
	A	Type 63
	B	Type 65
	C	Type 67 (HART)
	D	Type 69 (magnet)
0	**Software version**	
	0	Standard
	1	Non compliant to EN54-10 and/or SIL

2 Technical features

GENERAL

Type	Optical flame detectors
DF-TV6-T	Multi-spectrum IR Flame detector
DF-TV7-V	Combined IR and UV detection.
Start-up time	15 secs
Self-test	Automatic periodic test through the window
Calibration	Factory set, no field recalibration

OUTPUT SIGNAL

4-20mA loop signal	Active type (source), max. load impedance 700Ω.
"4-20mA" format	4-20mA loop with a single fault level • Normal 4 mA • Flame alarm 20 mA • Fault or inhibition 1.5 mA • Optical autotest fault 1.5, 2.0 or 3.0 mA (configured by TLU600 / TLH710 / TLH720)
"0-22mA" format	4-20mA loop with multiple fault levels, suitable for PLC's and modern control systems. • Normal 4 mA • Flame alarm 20 mA • Inhibition 3.4 mA • Optical self-test fault 2.6 mA • HW/SW fault 2.0 mA
Relay output	3 x configurable relays max 1.7A/30VAC/DC (in option) 1

[1] This value changes to 1A when the security function uses the relays and the SIL level is required

ELECTRICAL

Power supply 24V DC,(Range 18 – 35 V DC versions DF-T#7)
(Range 18 – 30 V DC versions DF-R#7)

Power consumption

	IR3	UV2IR
Typical[2]	1.4w network : 2.6 w	1.5 w network : 2.7W
Maximum	5 w	5 w

Connection 0,5mm² (20AWG)-2,5mm² (13AWG)

MTBF: DF-TV7-T: 172 000 h
DF-TV7-V: 115 000 h

ENVIRONMENTAL

Temperature (Storage) -40°C to +65°C

Temperature (Operation) -40°C to +65°C

Pressure 1013 HPa ± 10%

Humidity 95% RH (non condensable)

Protection IP66

RFI/EMI Complies with EN 50130-4 (2011 AMD 2014)

PERFORMANCE

European EN 54-10/A1 (2005) [3]

EXPLOSION PROOF HOUSING

Material 316 L stainless steel

Weight 5.1 kg

ATEX/IECEx Please refer to §8.2

[2] Typical power: voltage 24 Vdc, current 4 mA, fault relay normally energized.
Maximum power: voltage 35 Vdc, current 22 mA, 3 relays energized, during optical self-test.
[3] Reference DF- V7-XT 0-0 -0 -0 - - -**1** is not compliant to EN54-10

FONCTIONNAL SAFETY [4]

SIL — SIL certification in progress according IEC/EN 61508 parties 1 to 7 standard

Detector	Data	Definitions	Values current output	Value relay output [5]
Multi IR DF-TV7-T 	λ	Failure rate per hour	$1.57x10^{-6}$/h	$1.53x10^{-6}$/h
	SFF	Safety fraction failure (T1=6 h)	99.2%	92.5%
	PFD*	Probability of failure on Demande	$8.41x10^{-5}$	$5.39x10^{-4}$
	PFH	Probability of failure / h (1oo1)	$1.23x10^{-8}$	$1.16x10^{-7}$
	MTTR	Mean Time To Repair	1440 min	
	SIL compliance	HFT = 0 / G.Fixed / 30°C / type B	2	2
UVIR2 DF-TV7-V 	λ	Failure rate per hour	$4.13x10^{-6}$/h	$4.09x10^{-6}$/h
	SFF	Safety fraction failure	99.6%	97.1%
	PFD*	Probability of failure on demand (T1=2.5 h)	$1.56x10^{-4}$	$6.10x10^{-4}$
	PFH	Probability of failure / h (1oo1)	$1.44x10^{-8}$	$1.18x10^{-7}$
	MTTR	Mean Time To Repair	1440 min	
	SIL compliance	HFT = 0 / G.Fixed / 30°C / type B	2	2

Updated SIL certificate pending. The values are given as an indication.

- *SF control periodicity : see § 7.1
- *SF control method : see § 7.1.4

[4] Reference DF- V7-XT 0-0 -0 -0 - - -**1** is not SIL compliant
[5] When the relays are in factory configuration: refer to paragraph 6.8.3.3

DIMENSIONS

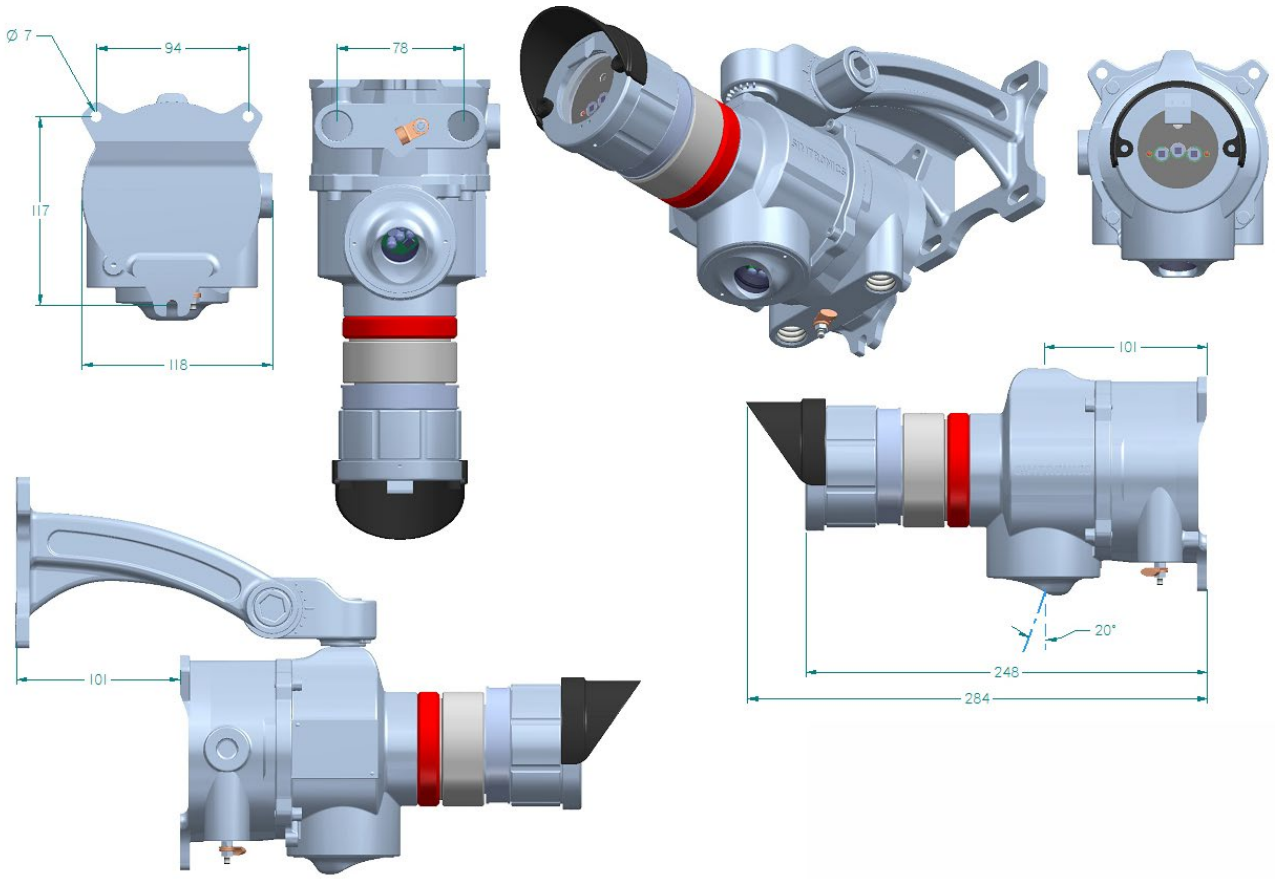


Figure 2 : Dimension drawings

3 Performances

3.1 Sensitivity

3.1.1 Fire class

Classification according to §5.5.3 – EN 54-10 (2006), (ethanol and n-heptane fires)

DF-TV7-XVA0 ET DF-TV7-XTA0

Sensitivity Time delay	50%	75%	100%
Min	Class 2	Class 1	Class 1
Max (20 sec)	Class 2	Class 2	Class 1

DF-TV7-XTB0

Class 1 for any combinations of sensitivity and time delay settings.

3.1.2 Fire range of detection

Detection range for a standard 1 square foot (0.33 x 0.33m) fire except where stated.

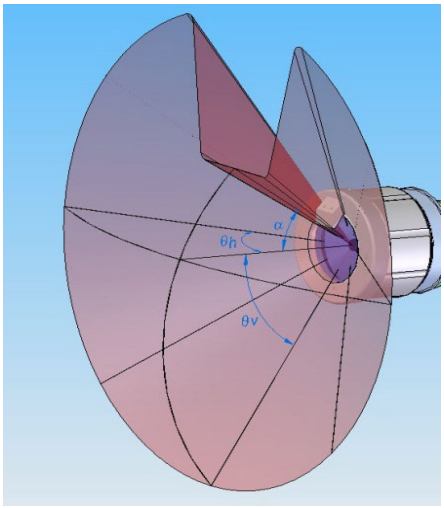
	XTB0 (IR³ – Long range)		XTA0 (IR³ –Standard range)		XVA0 (UVIR²)
Sensitivity / time delay	*75 % / 5 sec (Fact. Setting)*	*100 % / 5 sec*	*50 % / 5 sec*	*100% / 5 sec (Fact. Setting)*	*100 % / 2 sec (Fact. Setting)*
Ethyl alcohol**	37 m (122 ft.)	**50m (164 ft.)**	12 m (40 ft.)	**25m (82 ft.)**	**25m (82 ft.)**
Methanol*	**36m (120 ft.)**	48 m (160 ft.)	**12m (40 ft.)**	**30 m (100 ft.)**	**19 m (62 ft.)**
Diesel**	37 m (122 ft.)	**50 m (164 ft.)**	12 m (40 ft.)	**25m (82 ft.)**	**30m (100 ft.)**
Gasoline**	49 m (161 ft.)	**65 m (213 ft.)**	16 m (52 ft.)	**32m (105 ft.)**	**35m (115 ft.)**
JP4 (2x2 ft²)*	**55 m (180 ft.)**	73 m (239 ft.)	**21 m (70 ft.)**	42 m (138 ft.)	**55 m (180 ft)**
N-heptane*	**65 m (215 ft.)**	80 m (265 ft.)	**27 m (90 ft.)**	40 m (177 ft.)	**45m (147 ft)**
***** Methane**	45 m (147 ft.)	60 m (200 ft.)	15 m (49 ft)	**30 m (100 ft.)**	**35m (115 ft.)**
Propane (10in.)*	**6.4 m (252in.)**	8.5 m (336 in.)	2.4 m (95 in.)	**4.8 m (190in.)**	**4.8 m (190 in.)**

(*) Tested according to the FM 3260 standard
(**) Other measurements (*Italic:* calculated Extrapolation)
(***) Measured on a 0.17x0.17 size fire with a plume height of about 0.8 m
Bold = experimental measures, italic =extrapolations

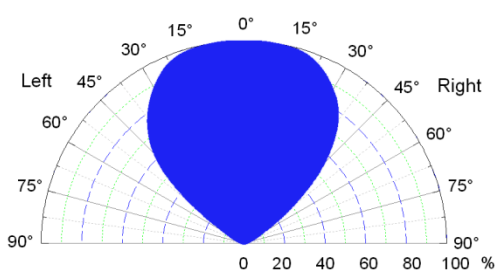
3.2 Field of View (Cone of Vision)

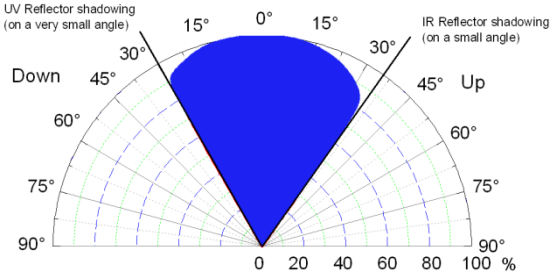
		DF-TV7-XVA0	DF-TV7-XTA0 and DF-TV7-XTB0
α_{max} : Maximum angle as defined in standard EN 54-10 (2006) - § 5.4		30°	35°
Angle at 50% sensitivity (in accordance with FM 3260 standard)	Horizontal total	97°	104°
	Vertical Up / Down	20° / 35°	30° / 52°

The vertical viewing angle is limited by the self-test reflectors on a thin solid angle

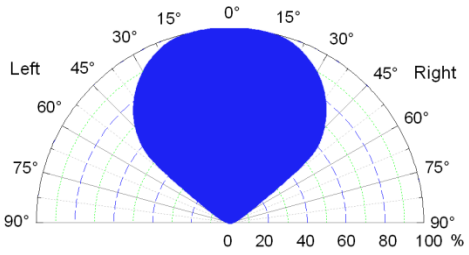


DF-TV7-XVA0

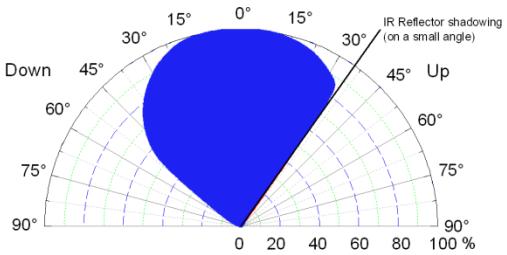




DF-TV7-XTA0 and DF-TV7-XTB0



Typical horizontal detection:



Typical vertical detection:

3.3 False alarm immunity (FM 3260)

	Distance m (ft.)	XTB0 (IR3) Long range	XTA0 (IR3) Standard range	XVA0 (UVIR²)
	Modulated / Steady	75 % / 5 sec (fact. setting)	100% / 5 sec (fact. setting)	100 % / 2 sec (fact. setting)
Arc welding, steady, #7014, 3/16 in, 190A	3.6 / 3.6 (12/12)	No False Alarm	No False Alarm	No false Alarm 7.6 / 7.6 (25/25)
1.5 kW heater	3.0 / 1.8 (10/6)	No False Alarm	No False Alarm	No False Alarm
100 W incandescent lamp	0.9 / 0.9 (3/3)	No False Alarm	No False Alarm	No False Alarm
Two 40 W fluorescent lamps	0.9 / 0.9 (3/3)	No False Alarm	No False Alarm	No False Alarm
100 W halogen lamp	2.4 / 2.4 (8/8)	No False Alarm	No False Alarm	No False Alarm

4 Installation

The detector must be installed in accordance with its certification and with the standards of the appropriate authority in the country concerned.

4.1 Location

The detector should be positioned above the targeted danger zone and at a distance corresponding to the type of fire it has to detect.

Be aware of potential radiation sources as these may trigger a false alarm. If possible, install the detector in clean zone, sheltered from major vibrations. For maximum effectiveness, avoid exposing the head of sensor to alternation of light and shade (passing vehicles, tree branches...).

IR sources (particularly if modulated) like hot machinery, exhaust outlets, etc. may also de-sensitize the detector, masking the radiation from a small fire.

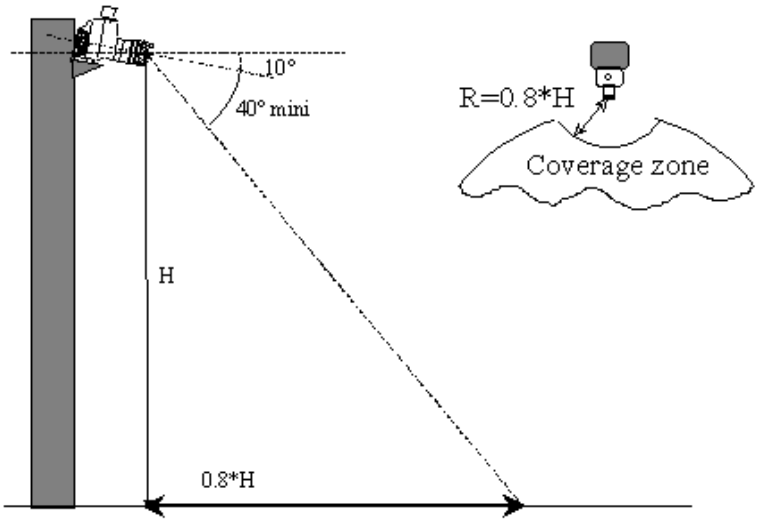
For detectors using the UV wavelength:

Do not position the detector behind a glass window as this blocks UV radiation. Locations where smoke, gas or vapours capable of absorbing UV radiation could accumulate (e.g. ceilings) should be avoided as well.

Detector fields of vision may be overlapped, particularly if the devices are used in a voting configuration.

The detector should have a direct line-of-sight to the potential fire source. Partial obstruction may reduce detection rate.

For an inclination of 10°, there is a semicircle blind zone, directly below the detector, with a radius of 0.8 times the detector height. With this angle, the optical axis "touch" the ground at a distance of 5.7 times the height.



4.2 Mounting

Use the two 7 mm diameter holes and the half-slotted hole to secure the support.

It is highly recommended to install the support with cable-gland downward in order to avoid water infiltrations. In case of horizontal position, it is advised to make one or two loops with the cable at the entry of the cable-gland.

When mounting the cable gland (sold separately), if no tightening torque is specified by the manufacturer, consider than a tightening torque of 20N.m +/-10% is the most suitable.

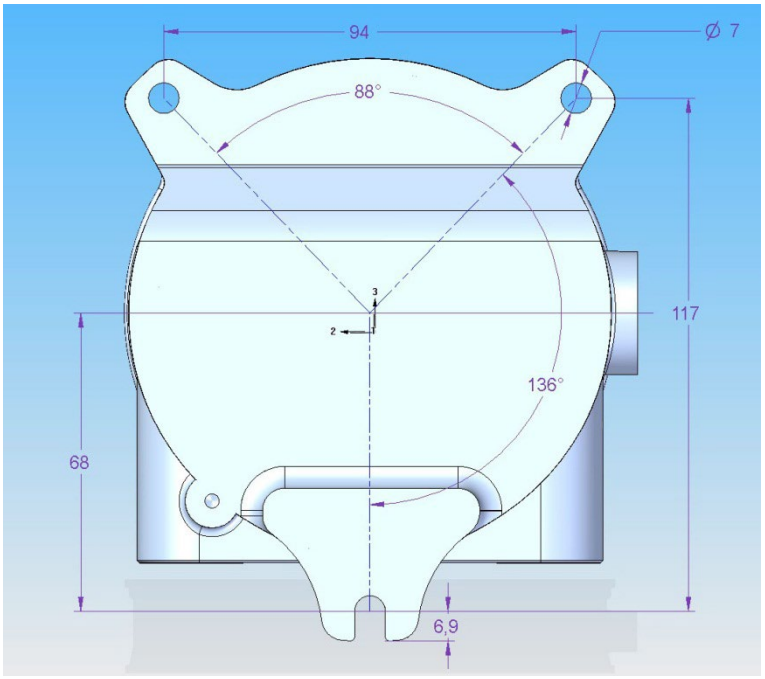


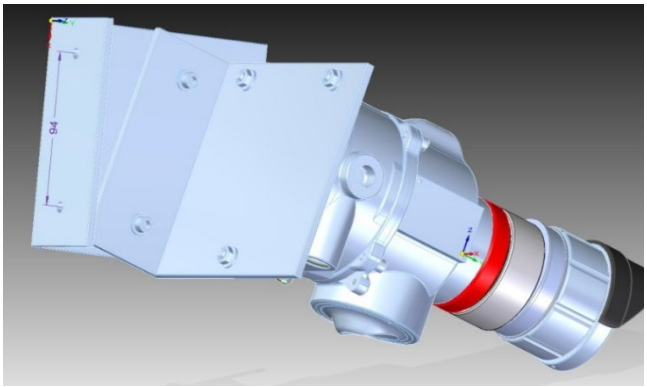
Figure 3 : Drilling dimensions for support fixing.

4.2.1 Multi-position support

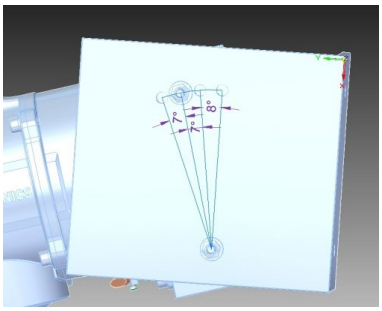
4.2.1.1 Multi-position wall mount bracket AS054

In this configuration, the support is made by two brackets connected each other by two CHC M6 screws.

The main bracket is fixed on the wall, allowing the detector to be in horizontal position, perpendicular to the wall. The vertical angle is adjusted using one of the 4 top holes of bracket.



Start by fixing the base support. The adjustment and termination of cables are performed into the base only. This limits the exposure of the electronic components in the housing to a minimum.



4.2.1.2 Ball pivot bracket – AS048

The detector is supported by a completely adjustable support. The assembly of the bracket with the device is done by a CHC M14 x 24 screw. These one is used to set the lateral orientation.

4 fixations (M8) fix the support to the wall or on a tube (2 inch or 2.5 inch). Tighten two CHC M14 screws allows the vertical orientation.

The whole weigh approximately 7 Kg.

4.2.2 Detector assembly

Check the presence and the good condition of the O-ring on explosion proof seal (no cracks, no cuts, good elasticity), make sure the flameproof joint is correctly greased and has no visible damage.

Plug connectors to the base, as described in paragraph “Electric connection”.

Fit the main housing on the base, placing the cable excess in the base. Tighten the four M5 screws with their grower rings.

It is possible to set up a suspension cable (not supplied) between the base and the housing (at the lower part) with the two threaded holes (M4 x 6).

Only the screws of property class A4 (yield stress ≥ 600MPa) must be used as a special fastener.

4.2.3 Sunshade / bad weather protection

A sunshade / weather protection (AS056-450) in light and resistant material (UV resistant) is available. Mounted above the detector, it gives an additional protection against sun and bad weather.

4.2.4 Detector cartridge visor

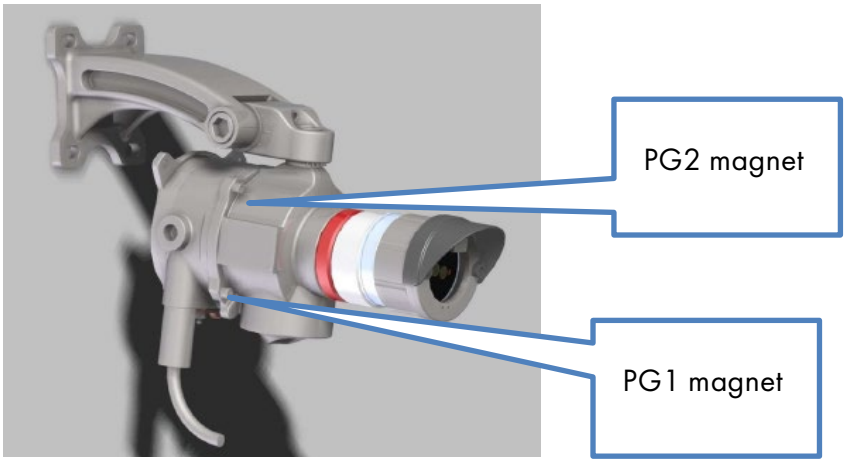
The detector is fitted with a short visor for protection of the optical detector window (standard). There are two additional models available if further protection is required.

AS040: Long visor with no horizontal coverage reduction

AS041: Long visor with side blinker.

4.2.5 Magnets identification

The magnets are identified by the "PG1" and "PG2" symbols on the housing.



4.2.6 Cable's inputs (as an option)

Connection cables must pass through a cable gland (Explosion Proof certified)

For installation details, refer to the instructions provided by the manufacturer of the cable gland used.

The unassigned cable glands entries must be blanked with explosion proof certified plugs (M20). They are glued with Loctite (tubetanche 577) or equivalent compound. If a plug is moved or removed, it must be glued again with Loctite or an equivalent.

4.3 Electric Connection

Never adjust electric connections when detectors are powered. Maintenance must be undertaken by qualified staff. Observe safety site rules.

MultiFlame DF-TV7 is a sensor with standard current output 4-20mA. The connection can be on 3 or 4 wires. The 4 wires configuration allows insulation between the signal and power loops.

We recommend using an armoured and shielded cable, type NF M 87 202, in accordance with the requirements for hazardous areas and NF C 15 100. Other cables can be used if they are compliant with the local regulations and standards.

The table below shows the maximum cable lengths based on the wire cross section and the supply voltage delivered by the detection unit.

Min. single wire cross area mm²/AWG	0,5 (20)	0,9 (18)	1,5 (16)	2.5 (13)
Supply voltage 24VDC	411 m	721 m	1000 m	1000 m
Supply voltage 24VDC -10%	247 m	433 m	765 m	1000 m

NB : Those values are calculated for a minimum supply voltage of 18VDC at the sensor level and for the maximum consumption of the detector (3.5W)

4.3.1 Connection of the electrical ground braid

Use a shield connection clamp (not supplied) to connect the shielding of the cable to the electric ground of the housing (see below).

4.3.2 Grounding

A M4 screw passes through the body of the enclosure, enabling the electronic ground of the housing to be connected to the local ground.

The armour of the power cable is normally connected to the ground of the detector, but it may depend on site practices.

The external earth connection must be made in accordance with the regulations in force.

4.3.3 Installation recommendation

There are three different type of power supply:

- 3-wires connection (source):
  The output current is not isolated from power supply, provided from detector (standard connection).
- 3-wires connection (sink):
  The output current is not isolated from power supply, consumed by the detector
- 4-wires connection:
  The output current is isolated from power supply

NB: The power potentials are isolated fromthe electric ground of the housing.

Total loop resistance:
Whatever the power supply type (3 wires source or sink, 4 wires), the total loop resistance (resistor + cable) should not exceed the following value :

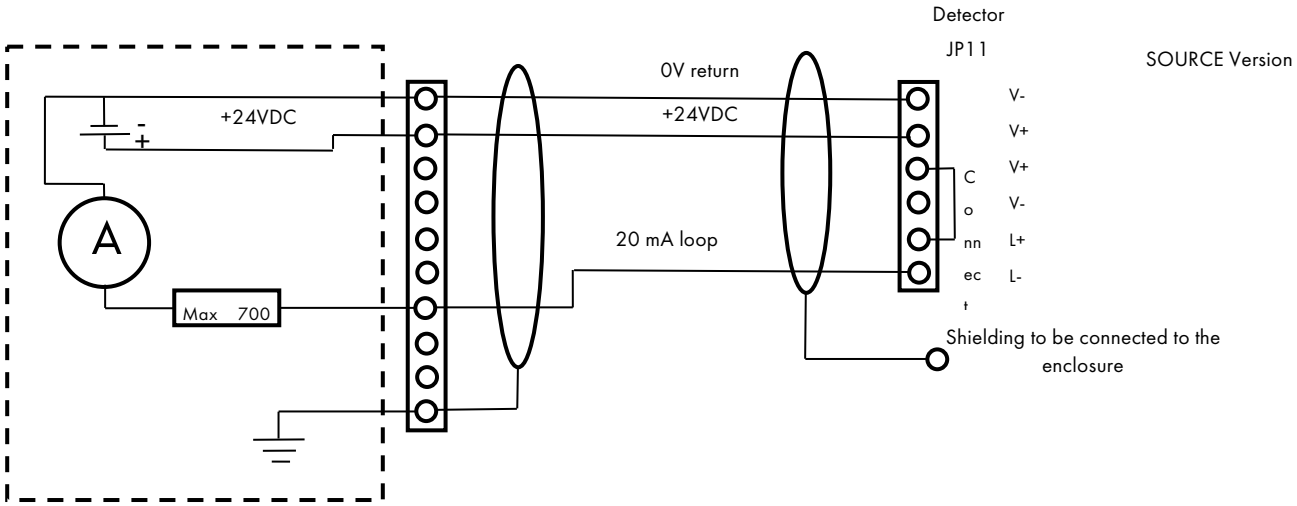
$$\text{R maxi} = \frac{\text{Power supply voltage} - 8\text{V}}{22\text{mA}}$$

The total loop resistance should not exceed 700 Ω with a voltage of 24Vdc

Terminal blocks :

Point	JP11	Description
1	V-	0 V retour
2	V+	+24VDC power supply
3	V+	+24VDC power supply loop (connected to point 2)
4	V-	0 V, connected to point 1
5	L+	20mA current loop : entry
6	L-	20mA current loop : output

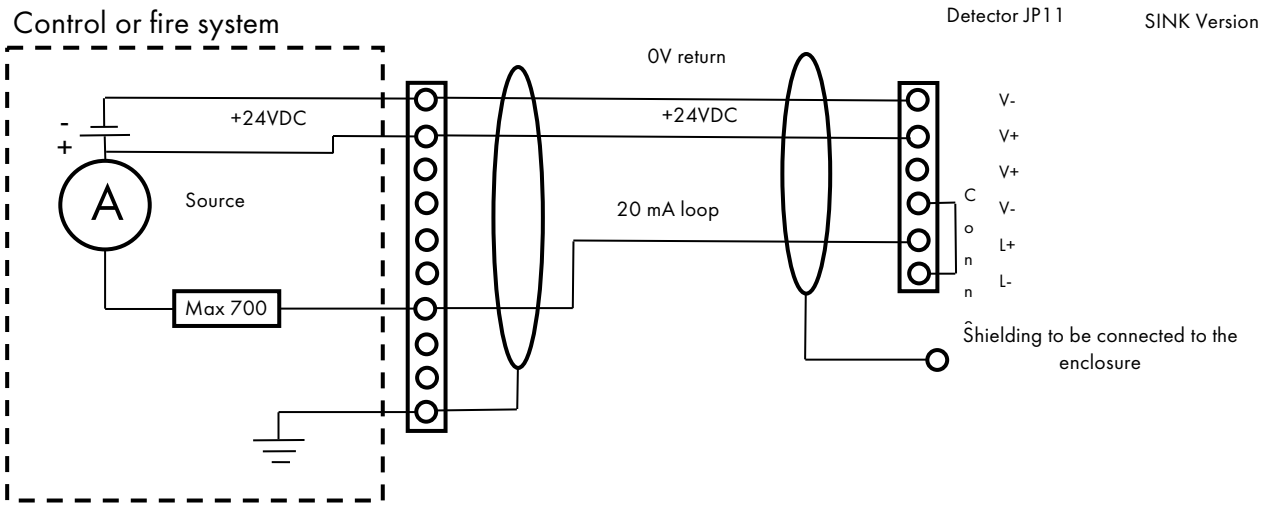
4.3.3.1 3-wires connection (source)



In this case, the output current is not isolated from power supply, provided from detector (standard connection).

The 20mA current loop must be supplied with 24 V at terminal L+. To proceed, connect the 3 (V +) and 5 (L +) terminals at the terminal block level of the device.

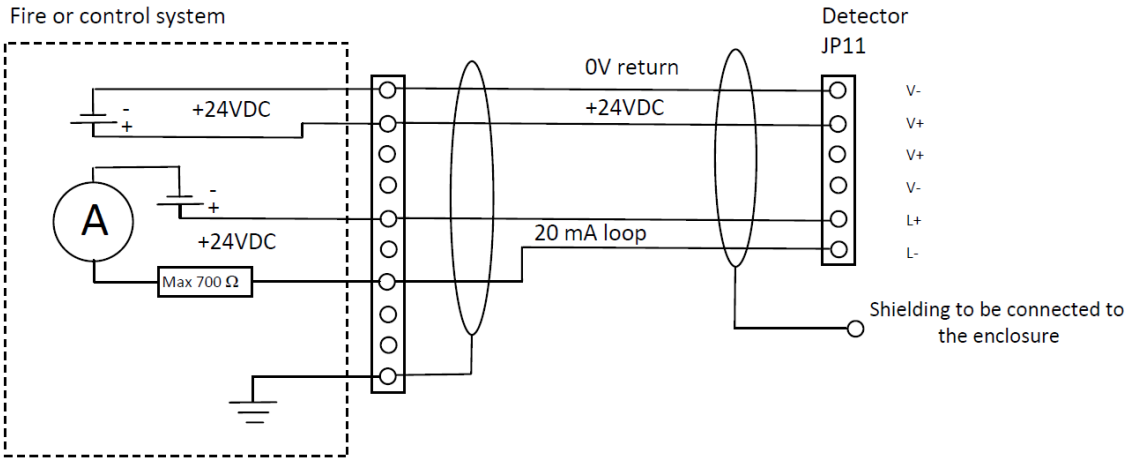
4.3.3.2 3-wire connection (Sink)



In this case, the output current is not isolated from power supply, consumed by the detector.

The 20mA current loop must be supplied with a PLC. The current return must be connected to the 0V at the level of the L- terminal. To proceed, please connect the 4 (V-) and 6 (L-) terminals at the terminal block level of the device.

4.3.3.3 4-wires connection (isolated power)



When using a 4 wires connection, the current loop is provided by the input module or PLC. The loop (L + and L-) is optically isolated from the detector. 4-20mA or 0-22mA input module of the PLC has to power up the current loop with, at least 8V at the terminal level.

4.3.4 Relay

An optional card with 3 relays can be added on the detector.

The output relays can be connected to the detection unit or warning devices.

For the network version, the optional relay card cannot be installed.

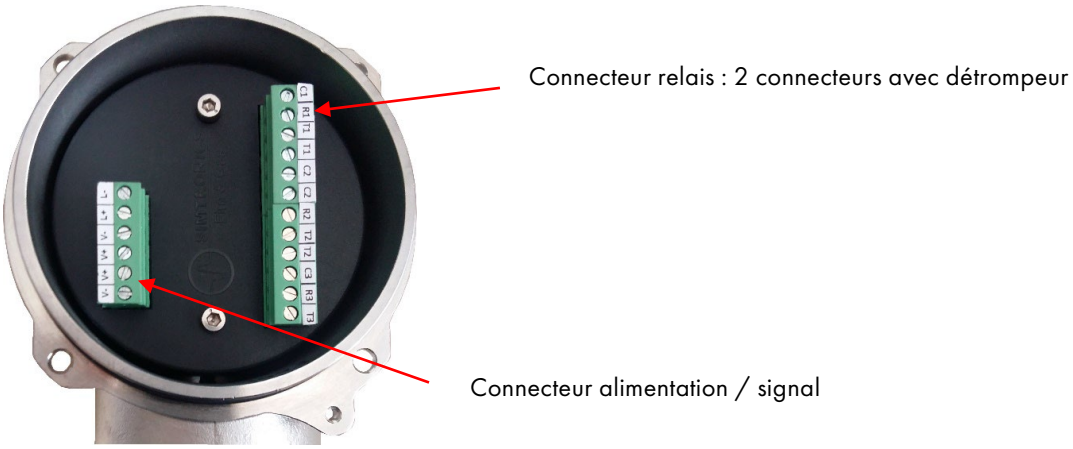
Each relay can be configured:

- normally closed or normally open.
- on one or more states of the detector (fault, permanent Inhibition, alarms).

For relays configuration and factory settings, refer to §6.8.3.3

Relay card, terminal block (option):

Point	JP2	Description
1	C1	Relay1 common
2	R1	Relay 1 de-energized
3	T1	Relay 1 energized
4	T1	Relay 1 energized
5	C2	Relay 2 common
6	C2	Relay 2 common
7	R2	Relay 2 de-energized
8	T2	Relay 2 energized
9	T2	Relay 2 energized
10	C3	Relay 3 common
11	R3	Relay 3 de-energized
12	T3	Relay 3 energized



4.3.5 EOL Resistor

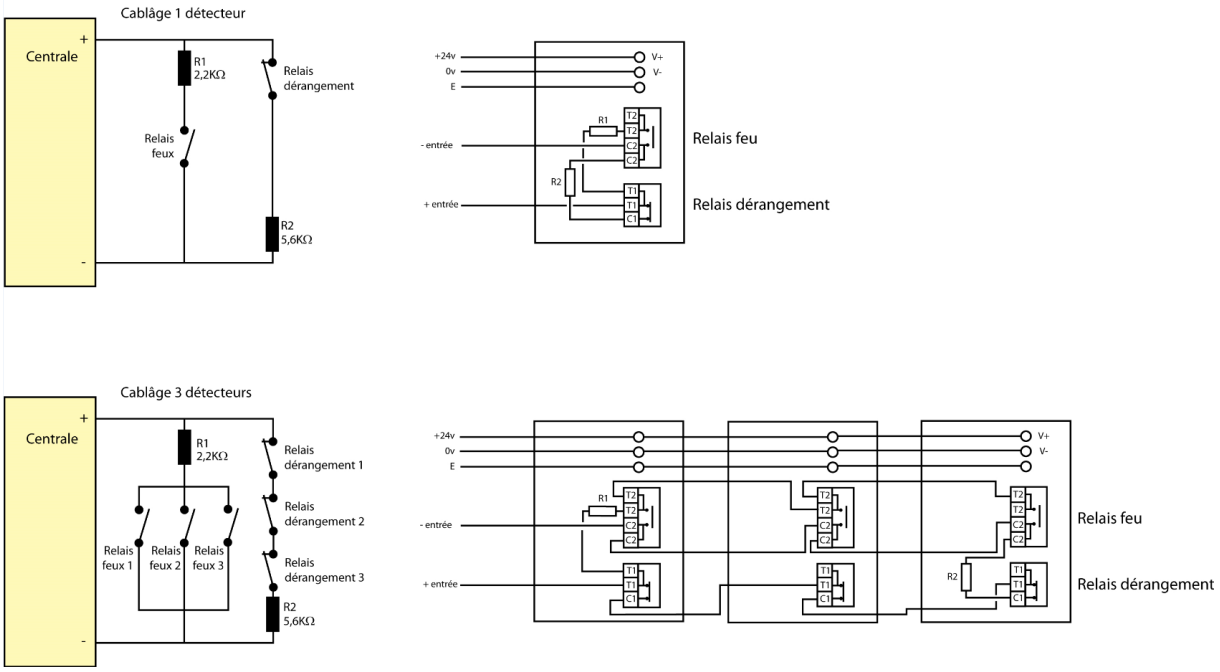
This applies to ATEX/IEC installations only. The EOL resistor must only be used inside the housing on the terminal block.

This configuration allows the detector to be connected to PLC.

Because this type of device cannot operate the detector's 4-20 mA signal, the relays are used to interface with the detection loop.

Maintain a 10mm minimum gap between the resistor and the terminal block or any other neighboring parts.

The recommended connections are indicated below:

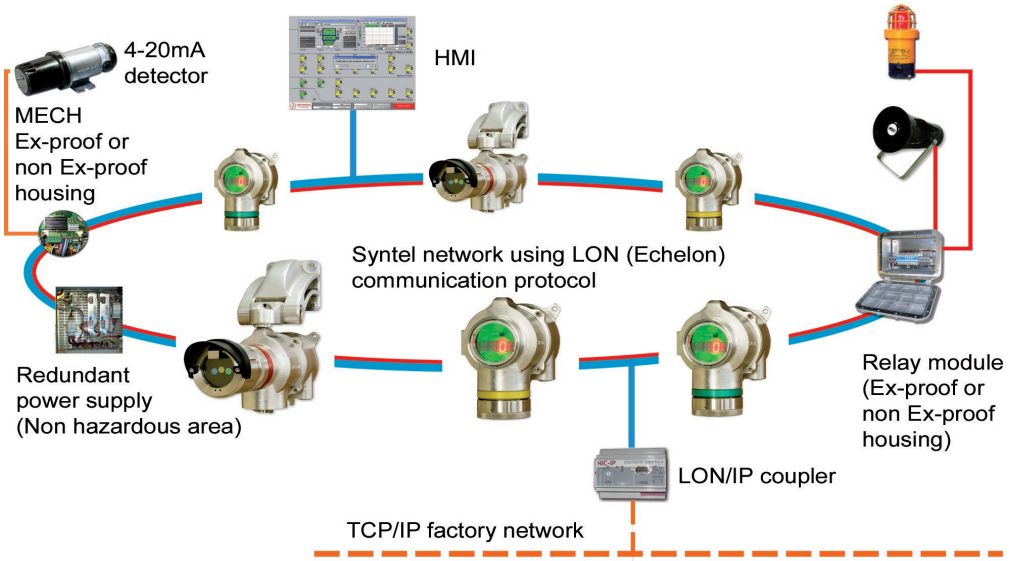


NB:

The R1 value is given as an indication. It must comply with the following conditions:

- Minimum consumption = 5 Watts
- Maximum dissipation = 2.5 Watts

4.3.6 Syntel connection



In this network version, an electronic board is inserted in the detector body and is used for electric connection.

Connecting the ground terminal should be performed thanks to 3-wire shielded cables.

The connection of power supply wires (4 on side A and 4 on side B).

- Two red wires on V +: +24 V
- Two white wires on V-: 0 V

Connexion of the media wires (2 on side A and 2 on side B)

- A red wire on one of the N
- A white wire on the other N (no specific edge)

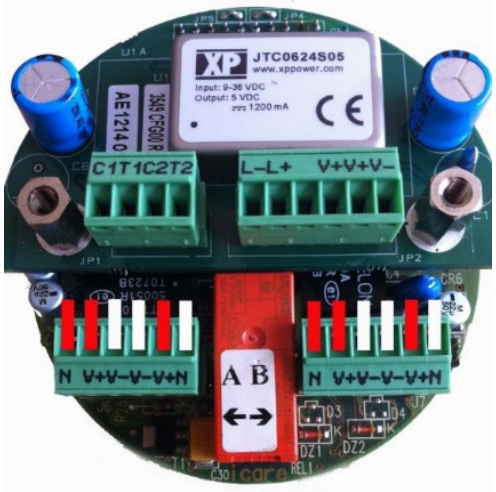


Figure 4 : Connecting drawing of the network versions

On board relays are not available on the digital version of the flame detectors.

For more detail, thanks to refer to the operating manual NOSP 15251

4.4 Detection cartridge

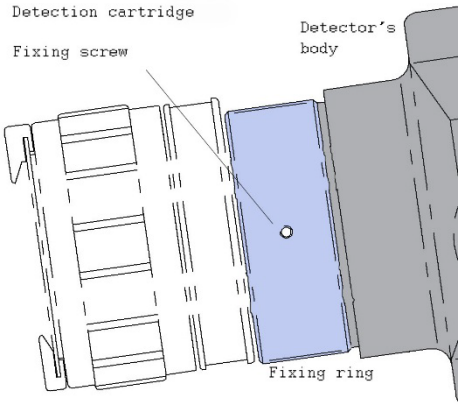
The cartridge is separated from the detector to enable its replacement. Its dismantling is extremely easy and does not need to touch the rest of the unit.

Be careful when plugging or removing the detection cartridge.

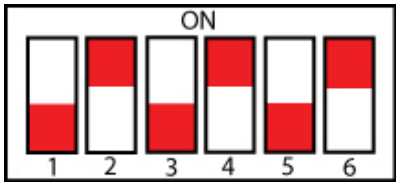
- Align the centring pin of the cartridge with the corresponding hole in the housing.
- Insert the cartridge in the bell, holding the two parts as parallel as possible.
- Introduce the pin in the hole without damaging the cartridge bottom connector when tightening the two parts.

These interventions imperatively require power to be off.

The Cartridge is fixed with a threaded fixing ring. Loosen the fixing screw in order to unscrew the cartridge.



Default detection mode of the XVA0 (UVIR²) may be changed using DIP switches at the back of the cartridge



Switches S1 and S2 are used for the UV/IR detection mode as shown in the table below. The configuration is frozen and cannot be changed with the TLU. Switches S1 and S2 are not used for the multi-spectrum sensor cartridges (3IR).

Detector mode	S1	S2	Comments
UV + 2xIR	ON	ON	Factory setting
UV + 2xIR	OFF	OFF	
UV only	ON	OFF	The detector is now a single UV flame detector.
IR only	OFF	ON	The detector is now a 2xIR flame detector

UV only and IR only configurations are not compliant with CE DPC certificate.
Moreover, those configurations are more susceptible to trigger false alarms.

Switches 3 and 4 sets the sensitivity. However, it is overwritten by the software and can be changed with the TLU600.

Detector mode	S3	S4	S5	S6	Comments
100% sensitivity	ON	ON	ON		Default
100% sensitivity	OFF	OFF	ON		
75% sensitivity	OFF	ON	ON		
50% sensitivity	ON	OFF	ON		
5 sec delay			ON	ON	OFF = 2 sec delay

S5 always on ON

5 Commissioning

5.1 Visual inspection

Make certain that all the operations of the "Installation" chapter have been achieved correctly.

Pay particular attention on installation conformity, check the cables entry, the presence of O-rings, and the connexion of the cartridge.

- Check if the detection mode (UV/IR, 3IR) match with the marking

5.2 Power-up

The sensor is powered and operating when the green LED on the communication head is blinking.

- Check the connection to the control unit

5.3 Operational tests

All MultiFlame detectors are delivered set and tested. Some additional tests are necessary to check the good working of the loop. Please make sure to have all authorizations needed before running the following operations:

- Check the states/information using the wireless configuration tool (TLU)
- Check alarms delay setting: (factory settings)
    - 5 seconds for XT versions
    - 2 seconds for XV versions
- Eventually, adjut the value up to 20 sec

The alarm state needs the fire detection to be continuously detected over the full temporisation delay to be activated

Sensitivity setting

- Factory settings:
    - 100%
    - Except for XTB0 version (high sensitivity) 75%
- Eventually adjust the sensitivity between 50% / 75% and 100ù of the maximum coverage distance
- Test the channel by trigging an alarm using the LT15 test lamp or force the output to 20mA via the TLU600.

5.4 Using the LT15 test lamp

The LT15 is a flashing test lamp used for functional test of flame detectors.
The emission is pulsed in order to be detected by the detector, but this detector must be put in LT15 mode by the TLU600 or TLH710 or TLH720. When the LT15 signal is detected, the LEDS located on the front of the cartridge are activated (red LED corresponding to IR detection and yellow LED to UV detection).

The relays and current output can be activated or not activated by the TLU.The TLU menu commands are described in §6.6.

Information :

- The emission spectrum of the lamp is between 180 nm (UV) and 5 µm (IR).
- LT15 is certified Ex d IIC T6-T5 and suitable for operation in areas with explosion hazard, (zone 1 and 2) in accordance with the EN 60079-0 and EN 60079-1 standards.

For general information about the test lamp, refer to the LT15 Operating manual.

6 Operation

6.1 Environmental conditions

- Dust: Dust on the window may limit UV sensitivity
- Oil vapour: Oil vapour on the window can reduce UV sensitivity
- Water/Ice: The presence of Water or ice can reduce flame detector performances at an infrared level.

6.2 Inhibition

Maintenance Inhibition is temporary. It appears during power up and maintenance phases. Inhibition stops automatically when the operator leaves the maintenance menus or 10 minutes after the end of communication with the TLU.

Maintenance inhibition can be configured in "frozen" mode (factory setting) or in "free" mode by the TLU or via the HART protocol. It cannot be configured by the magnetic wand.

- In "frozen" mode, outputs (current and relay) remain in their previous state.
- For example, if the device indicated a failure (2.0 mA), this state would be maintained during the inhibition.
- If the unit is configured in "free" inhibition mode, the output current will be on the same level as for the permanent inhibition

The permanent inhibition is activated by an order issued by the TLU when an operation is performed at/or around the device, or when the operator wants to inhibit a faulty device. The permanent inhibition must be removed by an operator's deliberate action using the TLU.

When working with the LT15 test lamp, the detector must be in TEST-mode. The default output is in maintenance inhibition; but the detector's outputs (current loop and relays) may be activated in order to test the complete loop (Requires access level 2 on the TLU).

Local LED and Information on the TLU are activated anyway.

6.3 Signal current loop

Status	"4-20" [mA]	"0-22" [mA]	TLU state
Line fault	0.0	0.0	
Configuration fault	1.5	2.0	DEF
Hardware fault	1.5	2.0	DEF
Sensor fault (Optical self-test)	1.5/2.0/3.0 ①	2.6	DEF
Start-up inhibit	1.5	3.4	Countdown
Permanent inhibit.	1.5	3.4	INH
Maintenance inhibit. Default / ("Free mode") ②	Previous value / (1.5)	Previous value / (3.4)	INH
Operation, No faults, No Alarm	4.0	4.0	No detection No alarm
IR detection ③ UV detection ③ Pre alarm (Detection but still waiting for time delay) ③	(8.0) (12.0) (16.0)	(8.0) (12.0) (16.0)	(IR detection) (UV detection) (Pre-alarm)
Confirmed Alarm	20.0	20.0	Alarm

①Configured by TLU600 / TLH710 / TLH720

②The maintenance inhibit can be set to "Frozen mode" (factory setting), or "Free mode".

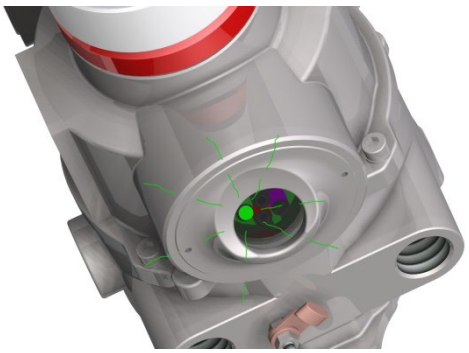
③The standard detector alarm output is either No alarm = 4mA or Confirmed alarm = 20mA. Pre-alarm states (8 / 12/ 16 mA) are available when the detector is in "expertise mode".

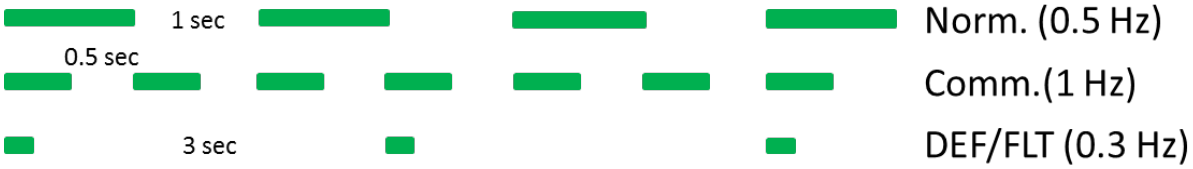
6.4 Power and fault indications

A green LED located in the communication head blinks at 0.5 Hz in normal operation mode.

When the device communicates with the TLU, the frequency goes to 1Hz. When the magnetic wand is applied on the detector, the LED remains steady.

In Fault mode, the LED frequency goes down to 0.3Hz.



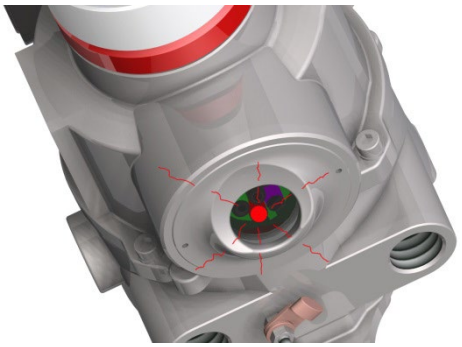


6.5 Alarm indication (LED)

A red LED placed in the communication head blinks when in fire alarm.

In standard configuration, the fire alarm is latched and the red LED keeps blinking until it is acknowledged with the TLU or the magnetic wand or until the detector is powered cycle.

With respect to **DF-TV7-X##0-0X#-0N** versions, the fire alarm is unlatched and the LED stops blinking when the fire alarm disappears.



DF-TV7-X##0-0X#-**0N** versions are not EN 54-10 compliant.

When the fire alarm is latched, the red LED keeps blinking until the alarm is reset.

6.6 Wireless communication tool TLU600

All settings and tests of detectors can be done by the wireless communication tool TLU600.

This communication tool and its software are compatible with all TELEDYNE OLDHAM SIMTRONICS detectors: MultiFlame, MultiTox and MultiXplo.

Communication is made via infrared link (IrDA), similar but more efficient than infrared links for computers. IrDA head should not be placed facing the sun as it significantly reduces the communication with the TLU600.

Please refer to the wireless communication tool operating manual for more details

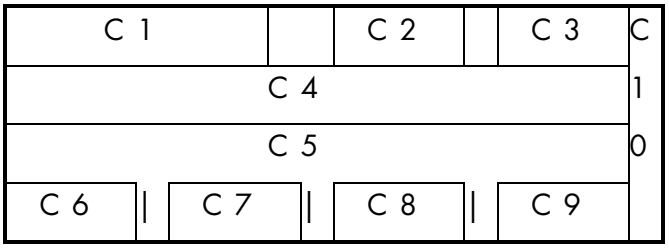
When the detector communicates with the TLU, the green LED blinks at 1Hz so that the user can easily identify the detector in communication mode.

The TLU600 menu is composed of 2 access levels allowing both settings and obtaining information about detector's status.

- level 1: exploitation
- level 2: Maintenance

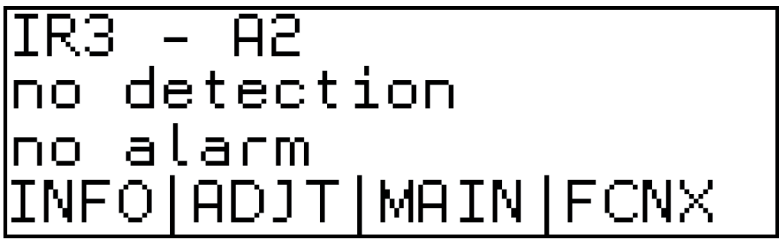
6.6.1 Main screen

The main screen is composed into several data fields.



- *C1: Detector name field*
- *C2: Field blank if normal operation; INH- if inhibited*
- *C3: Field blank if normal operation; FLT- if at least one fault has occurred*
- *C4: State of detection: no detection, cartridge fault*
- *C5: State of alarm: alarm, no alarm*
- *C6, C7, C8 and C9: Name of keys F1, F2, F3 and F4*
- *C10: Wireless communication tool pictograms*

Main screen displays identity and state of the detector.



6.6.2 General operation

The user can navigate through the menu with the F1 to F4 keys, whose functions change depending on the fields displayed above each key. Standard functions:

- >>>>Scroll function / next screen.
- ESCExit the current menu and return to the previous one.
- CHGChanging displayed value.
- VALValidation and Check-in of the changed value.

The changed value must be confirmed by pressing [VAL] key, otherwise the old value will be kept when leaving the menu.

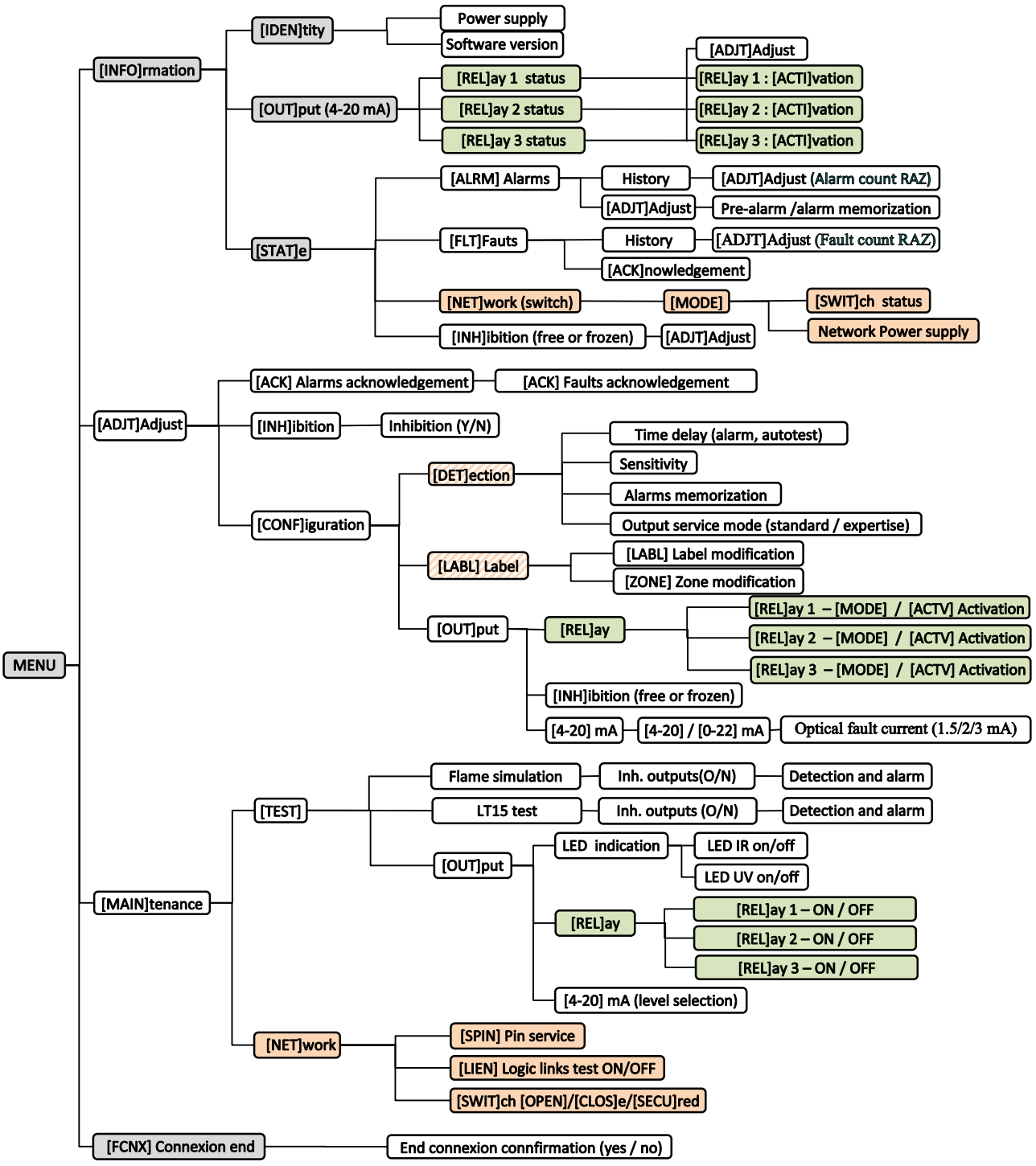
6.6.3 Menu structure

- Exploitation:

  This level enables access to the information and the status of the detectors. It does not allow the configuration operations or write access.

- Maintenance:

  The access to the parameters and other maintenance operations is protected by a password. Default password (6 digits which can be changed): 012345.



Menus displayed without access code
Menus displayed with relay board
Menus displayed with Syntel board
Menus not displayed with Syntel board

6.7 Information menu [INFO]

The information menu contains all information concerning the identity and settings of the detector. The first screen gives the detector's reference and its serial number.

6.7.1 [IDEN]tity submenu

Presentation of:

- detector operation mode (UV/2IR, UV, IR(2IR or 3IR))
- Sensor sensitivity (50, 75, 100%)
- Alarm time delay (seconds)

Sub-menus present the board software version and the power supply voltage.

6.7.2 [OUT]put submenu

Presentation of:

- Curent protocol (0-22 mA or 4-20 mA)
- Normal state of the relays (normally open or normally closed)
- Conditions of relays activation

Relays can be set with a level 2 access.

6.7.3 [STAT]e Information sub-menu

Presentation of:

- Alarms history
- Alarm activation
- Faults list (use F1 key to scroll faults)
- Alarm count since last reset
- Failed optical self-test count since last reset

6.7.3.1 [ALRM] Alarm screen

Allows Alarms history display.

6.7.3.2 [FLT.] Fault screen

Displays a list of eventual faults (press F1 key to scroll through the list)

6.7.3.3 Network Screen Switch

This menu and its sub-menus are used for the network detector settings. For any further details, please refer to the Syntel system operating manuals.

Mode screen

The first line shows the operating mode of the sensor in the network (logic link test/out of order/emulation).

The second line shows if the network part of the detector is "operating" or "out of order". For any further details, please refer to the Syntel system operating manuals.

Network screen: alim

Information displayed:

- Voltage A: ON / OFF
- Voltage B: ON / OFF

For any further details, please refer to the Syntel system operating manuals

6.7.3.4 [INH] screen

This screen is dedicated to verify the inhibition mode configuration (frozen or free). If the access level permits it, it is possible to change this setting.

6.8 Adjustment menu [ADJT]

This menu presents all the detector settings. All the functionalities, except alarms acknowledgment, request access level 2.

6.8.1 Alarms Acknowledgement

This menu enables the acknowledgement of latched alarms. Alarms can be acknowledged only if the alarm condition has disappeared.

6.8.2 Inhibition / End of inhibition

The inhibition (called permanent inhibition) is activated or deactivated manually using the menu. This function is used for deactivating the detector outputs (example: during maintenance).

The « inhibition » menu is available if the sensor is not in inhibition, maintenance inhibition or simulation. Selecting the inhibition mode will switch the detector in inhibition mode.

The message "End of inhibition" is displayed on the TLU.
Press on "End of inhibition" to get the detector back to normal operating mode.

6.8.3 [CONF]iguration sub-menu

This menu gives access to the configuration of the detection, (time delays, sensitivity, alarm memorization), of the label and zone, of the relay output as well as the configuration of the outputs states control.

6.8.3.1 Detection

[Adjust] / [Config] / [Detection]

Alarm / Pre alarm time delay settings:

Time delay can be changed to suit the application. Some locations need a longer delay to suppress interference (Example: Gas turbines).
Please use TLU600 to adjust the delay:

- DF-TV7-V factory setting: 2 sec (minimum 2 sec / maximum 20 sec)
- DF-TV7-T factory setting: 5 sec (minimum 3 sec / maximum 20 sec). Also valid for UV and 2IR mode.

Sensitivity settings:

Detection range is available in three steps: 100%, 75% and 50%. This percentages refers to the actual detection range and not to the optical signal strength.

Alarm settings:

Alarm and pre-alarms can be latched or unlatched. Use the CHG key to move from "latched" to "unlatched" (yes / no). Current status blinks on the display and reads "yes" or "no".

When alarms are latched, the user can either use the TLU or power cycle the detector in order to reset the alarm condition.

Output service mode:

- "Standard mode"

  All pre-alarms, UV or IR detections are disabled. Information is sent in case of confirmed alarm only.
- "Expertise mode"
- Current outputs, relays and LEDs, will be activated on pre-alarm, UV or IR detection (Ref 6.3).

6.8.3.2 Label and zone sub-menu

This menu allows label and zone's modification. After selecting a label or a zone, the modification function operates in the same manner.

Both "Label" and "Zone" fields are free text type for identification of the detector (name and position of the detector).

To edit fields, Select [label] or [zone]:

- Press on the corresponding numeric key to select a figure.
- Press [>>] to go to the next figure in the field.
- Press [PAGE] to go next page.
-

6.8.3.3 Output

[Set] / [Config] / [Outputs]

This menu gives access to the configuration of the relay operating mode and to conditions of activations.

State of the relays:

Each relay can be configured:

- Normally not-energized
- Normally energized

Factory setting:

- Relay 1:normally energized, activated by any fault or inhibition
- Relay 2: normally not energized, activated on alarm levels
- Relay 3: normally not energized, activated on alarm levels

Contacts are then described as below:

Detector status	Relay 1 "Fault"	Relay 2 "Alarm"	Relay 3 "Alarm"
Normal (no alarm, no fault, no inhibition and detector powered)	C1-T1 closed C1-R1 open	C2-T2 open C2-R2 closed	C3-T3 open C3-R3 closed
Pre-Alarm, UV / IR detection (*)	C1-T1 closed C1-R1 open	C2-T2 open C2-R2 closed	C3-T3 open C3-R3 closed
Alarm	C1-T1 closed C1-R1 open	C2-T2 closed C2-R2 open	C3-T3 closed C3-R3 open
Fault, UV, IR detection fault or inhibition	C1-T1 open C1-R1 closed	C2-T2 open C2-R2 closed	C3-T3 open C3-R3 closed
Maintenance Inhibition (during maintenance mode)	Depend of configuration. See chapter 6.2		
Power loss	C1-T1 open C1-R1 closed	C2-T2 open C2-R2 closed	C3-T3 open C3-R3 closed

(*) Available when the detector is in expertise mode

Activation of the relays:

Each relay can be activated on one or several following conditions:

- IR detection (expertise mode only)
- UV detection (expertise mode only)
- Pre-alarm (expertise mode only)
- Alarm
- UV detection fault
- IR detection fault
- On all fault
- Inhibition

Maintenance inhibition:

Maintenance inhibition can be configured in « frozen » mode (factory setting) or « free » mode.

- In « frozen» mode, the outputs (current and relay) remain in their previous state.
  For example, if the device displays a fault (2.0 mA), it will remain in this mode during the inhibition.
- If the device is configured in « free » mode, the current output will remain at the same level than the permanent inhibition

Current protocol configuration :

This menu gives access to the settings of the analog output (4-20 mA or 0-22 mA) and the optical fault value (1.5 mA , 2 mA or 3 mA).

For a digital detector:

- the configuration data's (label, zone and alarms) cannot be modified.
- the alarm menu is not available

6.9 The maintenance menu [MAIN]

6.9.1 Test sub-menu

The maintenance menu handles tests on the detector:

- Flame simulation using the integrated test lamps
- Detection tests using the LT15 test lamp or a test fire
- Relay output and LED tests

Entering the test menu enables the temporary maintenance inhibition mode.
Without any manual intervention, the sensor come back to normal mode after 10 minutes.

6.9.1.1 Flame simulation

This menu initiates an optical test using the integrated test lamps.

Test results are indicated by the detector LEDs and on the TLU (message). While entering into the menu, the detector will ask for outputs (current loop and relay) activation.

6.9.1.2 LT15 test menu

This menu enables manually tests on detection, using either a test fire or a test lamp (Type LT 15 TELEDYNE OLDHAM SIMTRONICS).

In this mode, "false alarms rejection" algorithms are by-passed, to make a simulated alarm easier to achieve.

All local visual indicators are activated (front cartridge LEDs, communication head red LED, TLU display). While entering into the menu, the detector will ask for outputs (current loop and relay) activation.

6.9.1.3 Output test menu

This menu allows the user to force the detector output state for loop testing:

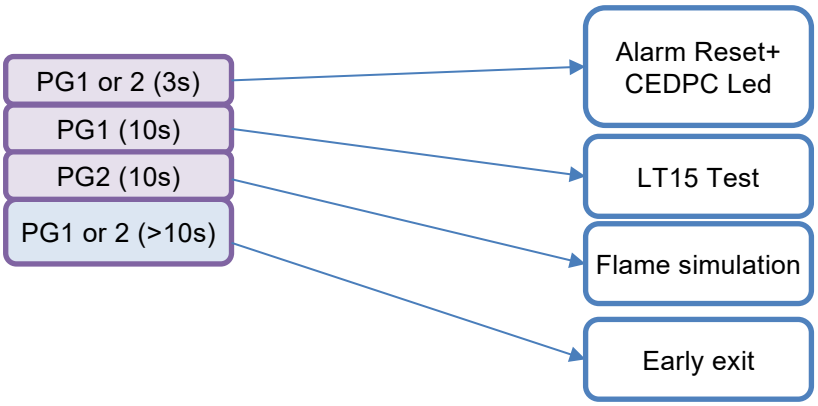
- Individual test of the UV and IR LEDs.
- Individual activation of each relay.
- Setting analogue 4-20mA output. Available values are: 0 mA, 2 mA, 3.4 mA, 4 mA, 8 mA, 12 mA, 16 mA and 20 mA by pressing on ++ or -- pad.

6.9.2 Network

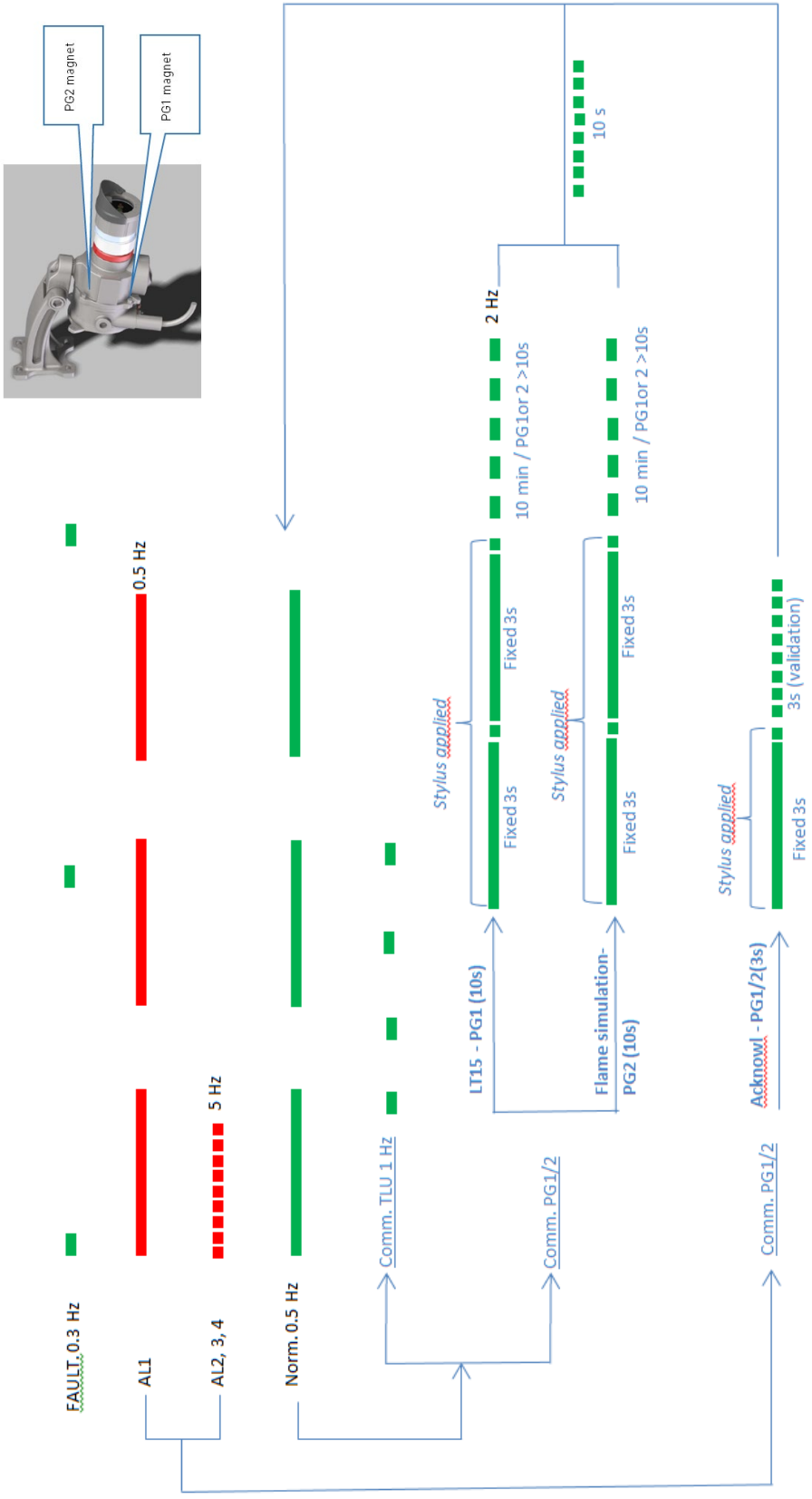
This menu is related to the Network variant of the detector (Syntel system).

6.10 Magnets Operation

The magnetic wand must be applied on PG1 or PG2 marks for a certain period of time depending on the operation you want to proceed with.



LED frequency indicates the command has been taken into account and whether the operation is complete.



Acknowledge (Alarm, CEDPC LED) :

⇨ Apply the magnetic wand on PG1 or PG2 for 3 seconds.

The green LED blinks quickly for 3 seconds to indicate that the operation is fully complete.

LT15 test:

⇨ Apply the magnetic wand on PG1 for 10 seconds.

The green LED blinks at 2Hz to indicate that the detector is LT15 mode. This mode is active for 10 minutes. If the user wants to exit to this mode without waiting 10 minutes, he must hold the wand on PG1 or PG2 for time > 10 seconds.

In the two cases, the green LED blinks at 5 Hz during 10s to indicate that the detector is going to exit this mode.

Flame simulation :

⇨ Apply the magnetic wand on PG2 for 10 seconds.

Perform the same operation as LT15 mode.

The table below gives you the different LED status along with the indication:

LED Status	Green LED	Red LED
Steady	• magnet detected	
Blinking 0.5 Hz	• normal mode • magnet not detected • no fault • no communication with the TLU	
Blinking 1 Hz	• detector is communicating with the TLU	
Blinking 2 Hz	• in LT15 or flame simulation mode • request for sensor identification by HART	
Blinking 5 Hz	• during 3s : Reset Acknowledgement • during 10s : Detector is exiting the LT15 or flame mode	• Alarm • CEDPC Alarm is latched
Blinking (100ms every 3 seconds)	• Detector Fault	

7 Maintenance

The interventions described in this chapter must be performed by competent and qualified staff. Device performances may be affected if the present instructions are not respected.

Cartridge unplug or device opening imperatively require power to be OFF.

7.1 Periodic maintenance

We recommend, a biannual check, but this can depend significantly on the operating conditions of the product and be adapted by the operating company.

However, with regard to the functional safety certification of the device (SIL), an annual check is a minimum requirement.

7.1.1 Visual inspection

Check detector positioning to be sure that there are no obstacle between the sensor and the potential source of fire.

7.1.2 Cleaning optical parts

Maintenance of flame detectors mainly relates to keeping the optical surfaces clean (window and reflector inside surface). In most installations a periodic cleaning is required.

Clean the detector window and the test reflectors, using a soft cloth soaked in a 50/50 mixture of Ethanol and water.

7.1.3 Flame simulation

Initiate a flame test using the integrated test lamps as described in §0. This can also be achieved using the LT15 test lamp as described in the LT15 operating Manual. Make sure that the detector is set in LT15 test mode as described in §6.9.1.2.

This test inhibits the outputs (relays and current loop), so test results are displayed on the TLU, as well as the alarm LED.

7.1.4 Loop test

To test the full loop there are several options:

- Perform a full loop test by exposing the detector to a flame
- Perform a two-part loop test using :
    - Forcing the detector outputs manually using the TLU or through HART communication as described in §6.9.1.3 in order to test the current output or the relay outputs
    - Using the LT15 test lamp and its associated menu (refer to §6.9.1.2) in order to test the detection part

Make sure that connections to the control system or fire panel and other links to extinguishing equipment are under control, avoiding unwanted alarms.

For any other operation, please contact your supplier or our technical services.

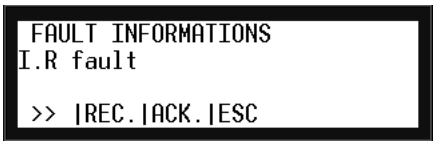
7.2 List of main faults

In addition of the current loop faults, other information is available from the wireless communication tool TLU600/610 (refer to § 6.6). If the detector does not work properly, the following table can help you to determine the causes and effects of different possible troubles.

Symptom	Possible cause	Action / Check
Green LED goes out	Power supply fault	Check power supply voltage at power supply and then at detector
No signal (4-20mA)	Power supply fault	Check power supply voltage at power supply and then at detector
	Line fault	Check line continuity.
	Current loop power supply fault	Check by inserting a milliamp meter into the loop. 4 wire connections only.
No connection with remote controller	No power supply to sensor	Is the green LED blinking?
	Dialogue problem	Try to use the TLU on another detector to confirm TLU operation.
UV or IR detection fault.	Detector window contaminated	Clean the detector window and test reflectors.
(The optical self-test has failed)	Faulty sensor.	If a LT15 flame test fails, then one or more of the optical sensors are faulty. Return the sensor cartridge to the factory

	Faulty self-test lamp.	If the above test succeeds, the sensors are OK, but the integrated test lamp is probably faulty. Return the sensor cartridge to the factory
Detector fault	Faulty electronics	Replace the detector.

DEFAUT IR OU DEFAUT UV



This particular fault occurs when the transmission of optical radiation to the detectors is no longer satisfactory.

This defect can appear following an unsatisfactory internal optical self-test and lead the device fault state. The self-test is carried out every 2 hours and is checked several times in the following half hour before leading to the fault state.

In most cases, a cleaning of the front window is enough to release the fault within the following five minutes.

DEFAUT MATERIEL

This type of failure is caused by electronic faults at the level of the detection cartridge or at the main electronics level (main housing).

This fault can also appear when communication between the cartridge and the transmitter is damaged, through a damaged link connector, for instance.

Usualy this kind of fault requires a material change.

7.3 Replacing the cartridge

Follow the instruction in §4.4.

7.4 Replacing the complete detector

If the operator needs to replace the complete detector, the easiest way is to take off the main housing from the base of the detector (for more details, refer to § 4.2.2).

As the base of the detector remains in place, cable glands do not need to be dismantled. If the detector is not replaced immediately, the "open" base must be protected against humidity, dust and shocks

No intervention should be performed when the detector is powered.

8 Certifications and standards

8.1 Functional Safety

DF-TV7-V and DF-TV7-T are **SIL2** certified [6]
LCIE FS-*-T-20131104R1
LCIE FS-*-T-20131103R1

IEC 61508 part 1 to 3	Functional safety of electrical/electronic/ programmable electronic safety (SIL 2)

In order to maintain the SIL level, the output current 4-20 mA (or relay output) must be check every 12 months.

This check is described in paragraph 7.1.4 (Loop test).

Important : The indicated SIL level applies for a safety function using either the current output or the relay output[7].

8.2 ATEX / IECEx Marking

The MultiFlame identification labels are located on the main detector housing in accordance with the ATEX directive 2014/34/UE and "règlement Produits de Constructions" (UE, n°305/2011)

- Manufacturer: TELEDYNE OLDHAM SIMTRONICS
- Model: DF-TV7...
- Serial no.: S/N: xxxxxxxxx (xxxxaamm)
- Approval type: CE RPC : 0333 CPR-075594 / CPR-075595 [8]

[6] Reference DF- V7-XT 0-0 -0 -0 - - -**1** is not SIL compliant
[7] If the relay outputs are used as a safety function then the relays must be in factory configuration to maintain the SIL level, namely :
Relay 1 : Normally powered, activated by the occurrence of a fault or inhibition.
Relay 2 : Normally not powered, activated on alarm.
Relay 3 : Normally not powered, activated on alarm.
[8] Reference DF- V7-XT 0-0 -0 -0 - - -**1** is not compliant to EN54-10

CE0080  II2G / Ex db IIC T6 Gb
CE0080  II2G / Ex db IIB T6 Gb
(2 mm > paint thickness > 200µm >
version : DF-*V7-****-***-**-*L*-*-*-*)

- Certification number: ATEX: LCIE 13 ATEX 3025X
  IECEx: IECEx LCIE 13.0022X
- Temperature: -40 °C < Ta < +65 °C
- Warnings Warning - Do not open when energized. After de-energizing, delay 2 minutes before opening.
- Protection: IP66
- Maximum voltage: 35 Vdc
- Maximum power consumption: 5 W

TELEDYNE OLDHAM SIMTRONICS does not allow any repairs of the flameproof joints and shall not be responsible for any modification of material.

8.3 SPECIFIC CONDITIONS OF USE

The equipment shall be equipped with suitably certified cable glands and blanking elements with a compatible type of protection for the intended use.

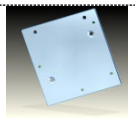
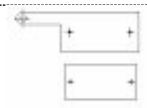
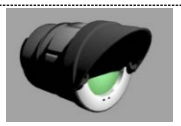
Only the screw of property class A4-80 (yield stress ≥ 600MPa) must be used as a special fastener.

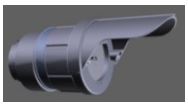
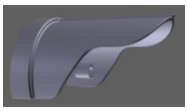
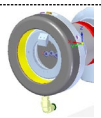
The equipment shall be installed and used according to the instruction manual provided by the manufacturer.

The flameproof joints are not intended to be repaired

Accessories and spare parts

9.1 Accessories

Accessories	Description	References
	Wireless hand held terminal for configuration and maintenance.	TLU600
	Remote control unit HART : Avalaible for adjustments and maintenance	TLH710 TLH720
	Test lamp	LT15
	Adapter plate from the former generation of detectors (BT05-BT606) to the new one (BT10 : DG, DGi)	AS0049
	Multi-position wall mount bracket Pipe or wall mounting	AS054 (2 parts)
	Ball pivot bracket Pipe or wall mounting	AS048
	Tag identification plate	AS215
	Tube mounting adapter Enables DM-T#6, DMi-TT6, DG-T#7, DGi-TT7 et GD10P lines to be mounted on a 2 inch to 2.5 inch diameter tube	AS053
	Sunshade. Plate to be wall or pipe mounted	AS056-450
	Sensor cartridge visor. Standard, fitted on detector.	AS039

Accessories	Description	References
	Sensor cartridge visor, long type, no viewing angle restriction.	AS040
	Sensor cartridge visor, long type, vertical angle restriction.	AS041
	O-ring. kit for housing and sensor cartridge.	4000284
	Magnetic wand required for adjustments and maintenance	AS055
	Air shield to protect the window again contaminants	AS045

Wipe non-conductive parts (plastic) that can use in ATEX area with a damp cloth (risk of electrostatic charges)

9.2 Spare parts

Spare parts	Ordering code
Sensor 3IR Standard range Aluminium,	DM-SV6-XTA0-0A0-00
Sensor 3IR Standard range SS316	DM-SV6-XTA0-0X0-00
Sensor 3IR Long range Aluminium	DM-SV6-XTB0-0A0-00
Sensor 3IR Long range SS316	DM-SV6-XTB0-0X0-00
Sensor UV2IR Standard range Aluminium	DM-SV6-XVA0-0A0-00
Sensor UV2IR Standard range SS316	DM-SV6-XVA0-0X0-00
Set of O-rings, including grease	4000284

TELEDYNE OLDHAM SIMTRONICS Everywhereyoulook™	**DECLARATION OF PERFORMANCE** N°0333-CPR-075594	Réf : **+NOSP0017160** *Rév. 2*

1. Unique identification code of the product-type : DF-ξV7-XTσ0-0αβ-0ρ-00ε-μ-φ-0

2. Intended use: Point flame detectors for fire detection system and fire alarm in building

3. Manufacturer : TELEDYNE OLDHAM SIMTRONICS
ZI Est Rue Orfila, 62027 ARRAS Cedex, France

4. System of assessment and verification of constancy of performance : System 1

5. Harmonised standard: EN 54-10 :2002 + A1:2005

Notified body : 0333 – AFNOR Certification

6. Declared performances

Essential characteristics	Performance	Harmonized technical specification
Nominal activation conditions/ Sensitivity, response delay (response time) and performances under fire conditions	Classe 1, classe 2	EN 54-10 :2002 + A1:2005
Operating reliability	Passed	
Tolerance on supply voltage	Passed	
Durability of operational reliability and response delay : temperature resistance	Passed	
Durability of operational reliability : vibration resistance	Passed	
Durability of operational reliability : Humidity resistance	Passed	
Durability of operational reliability : corrosion resistance	Passed	
Durability of operational reliability : Electrical stability	Passed	

The performance of the product identified in point 1 is in conformity with the declared performance in point 6. According to regulation EU no 305/2011, this declaration of performance is issued under the sole responsibility of the manufacturer identified in point 3.

ARRAS, July 09th, 2020

AM. Dassonville
Certification

Dass

TELEDYNE OLDHAM SIMTRONICS Everywhereyoulook™	**DECLARATION OF PERFORMANCE** N°0333-CPR-075595	Réf : **+NOSP0017162** *Rév. 2*

1. Unique identification code of the product-type : DF-ξV7-XVσ0-0αβ-0ρ-00ε-μ-φ-0

2. Intended use: Point flame detectors for fire detection system and fire alarm in building

3. Manufacturer : TELEDYNE OLDHAM SIMTRONICS
ZI Est Rue Orfila, 62027 ARRAS Cedex, France

4. System of assessment and verification of constancy of performance : System 1

5. Harmonised standard: EN 54-10 :2002 + A1:2005

Notified body : 0333 – AFNOR Certification

6. Declared performances

Essential characteristics	Performance	Harmonized technical specification
Nominal activation conditions/ Sensitivity, response delay (response time) and performances under fire conditions	Classe 1, classe 2	EN 54-10 :2002 + A1:2005
Operating reliability	Passed	
Tolerance on supply voltage	Passed	
Durability of operational reliability and response delay : temperature resistance	Passed	
Durability of operational reliability : vibration resistance	Passed	
Durability of operational reliability : Humidity resistance	Passed	
Durability of operational reliability : corrosion resistance	Passed	
Durability of operational reliability : Electrical stability	Passed	

The performance of the product identified in point 1 is in conformity with the declared performance in point 6. According to regulation EU no 305/2011, this declaration of performance is issued under the sole responsibility of the manufacturer identified in point 3.

ARRAS, July 09th, 2020

AM. Dassonville
Certification

Dass

With DF-ξV7-X#σ0-0αβ-0ρ-00ε-μ-ϕ-0

ξ	V	6 7	XV XT	σ 0	-0	α	β	-0	ρ	- 00ε	-μ	-ϕ	-0

C**	Compact capteur	
T**	Télécapteur	
R**	Capteur réseau / Network version	
	Famille / Families	
	V	Flamme / Flame
	Génération	
	**6	BT606 Boitier / housing
	**7	BT10 Boitier / housing
	Type Flamme	
	XV	UVIR²
	XT	IR3
	XW	UV
σ0	**Portée de détection**	
	A0	Portée standard / Standard range
	B0	Longue Portée (Version XT uniquement) / Long range (only XT versions)
0	**Type**	
	0**	Non utilisé ou flamme / not used or flame
α	**Variante**	
	A	Aluminium
	X	SS316L
β	**Interface**	
	**A	Protocole 0-22mA (Défaut sur le 0-4 mA/ fault on range 0-4mA)
	**E	Protocole 4-20 mA (Défaut commun / Common fault signal : 2 mA)
	**H	4 – 20 mA / 0-22 mA configurable & protocole HART
	**C	4 – 20 mA / 0-22 mA configurable
	**L	LON
0	**Cartouches**	
	0*	Cartouche flamme / flame cartridge
ρ	**configurations. spéciales**	
	*0	Standard
	*M	Version spéciale MarED (TX6 et TV6 type A uniquement)
	*N	Version spéciale AL LED non mémorisée (Non conforme EN 54-10) (flamme uniquement)
	*1	Customisation EPR (suivi spécial – SP4M20) (DM et DMi uniquement)
0εε	**Configuration**	
	000	Standard
	**A	Exempt de toute trace de graisse / grease free
	**B	Version spéciale MarED (ancien code) (TX6 et TV6 type A uniquement)
	**C	Version non EN 54-10 (ALRM non mémo) (type A uniquement)
	**F	Certified Telecaptor instead of IRDA cap
	**G	Peinture hydrocentrifugon (applications nucléaire) / Hydrocentrifugon paint (nuclear applications)
	**H	Peinture light grey (10A03 selon « British standards 4800/5252 »)
	**J	Peinture spéciale : RAL 3001 (Rouge)
	L	Epaisseur peinture >200 µm (version ATEX IIB)
μ	**Langue / Language**	
	0	Fr / GB
	F	Français / French
	E	Anglais / English
	P	Portugais / Portuguese
	C	Chinois / Chinese
	Hardware version	
	A	Type 63
	B	Type 65
	C	Type 67 (HART)
	D	Type 69 (magnet)
	Software version	
	0	Standard
	1	Non compliant to EN54-10 and/or SIL

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