SAFETY DEVICES

Certificate of compliance
In accordance with IEC 61508: 2010

N° 202915 / 2021A

The National Institute for Industrial Environment & Risks (INERIS – Institut National de l'Environnement Industriel et des Risques), a public organization, established by decree No.90-1089 of 7 December 1990, and accredited by COFRAC under number 5-0045 for certification of products and services (scope of accreditation available on the website www.cofrac.fr) issues a certificate of compliance related to IEC 61508 standards for the following product:

Denomination:	DF-TV7 series flame detectors
Type:	DF-TV7-XTA0, DF-TV7-XTB0 & DF-TV7-XVA0
Manufacturer:	Teledyne Oldham Simtronics
Applicant of the certificate:	Teledyne Oldham Simtronics Arras, France
Description:	series of 3IR and UV/2IR multiflame detectors with safety 4-20mA and relay outputs

Certification procedures are available under www.ineris.fr.

Parc Technologique Alata BP 2 F-60550 Verneuil-en-Halatte
tél +33(0)3 44 55 66 77 **fax** +33(0)3 44 55 66 99 **internet** www.ineris.fr
Institut national de l'environnement industriel et des risques
Etablissement public à caractère industriel et commercial – RCS Compiègne B 381 984 921 – Siret 381 984 921 00019 – APE 7120B

1. Functional safety

a. Safety function

Alarm function of the DF-TV7-XTA0, DF-TV7-XTB0 & DF-TV7-XVA0 with its 4-20mA output and relay outputs. The 2 certified functions are defined as below:

4-20mA output: Switching of the 4-20mA (or 0-22mA) output to 20mA in case of presence of flame in the detection zone for a duration greater than or equal to the time delay parameterized by the end user.

Relay output (optional): Opening of the alarm relays in case of presence of flame in the detection zone for a duration greater than or equal to the time delay parameterized by the end user.

b. Classification of safety functions

For the DF-TV7 series whose type is classified as « **type B**» and the architecture is **1oo1D** according the IEC 61508: 2010, the classification according **the Low demand and High demand** operation are:

Product	Safety function	Level of compliance	SFF	PFH	PFD
DF-TV7-T	4-20mA output	SIL 2	99,2%	$1,23x10^{-8}$	$8,41x10^{-5}$
	Relay Output	SIL 2	92,5%	$1,16x10^{-7}$	$5,39x10^{-4}$
DF-TV7-V	4-20mA Output	SIL 2	99,6%	$1,44x10^{-8}$	$1,56x10^{-4}$
	Relay Output	SIL 2	97,1%	$1,18x10^{-7}$	$6,10x10^{-4}$

Calculations have been performed with the following assumptions:

- Ti (Periodic Test Interval) = 1 year
- MTTR (Mean time to restauration) = 24 h

c. Assessed versions and configurations

The evaluation is valid for the following hardware and software versions and relays configuration

	Hardware		Software	Configuration
DF-TV7-T	Transmitter	PIE 3560-10 PIE 3558-2	IL 15582-11	▪ Relay: – N°1: Normally Close – N°2: Normally Open – N°3: Normally Open
	Cartridge	PIE 3481-3 PIE 3519-8	IL 14745-11	

	Hardware		Software	Configuration
DF-TV7-V	Transmitter	PIE 3560-10 PIE 3558-2	IL 15582-11	▪ UV: ON | 2xIR: ON ▪ Relay: – N°1: Normally Close – N°2: Normally Open – N°3: Normally Open
	Cartridge	PIE 3481-3 PIE 3482-5 PIE 3483-6 PIE 3484-8	IL 13542-9	

d. Reliability computation

DF-TV7-T		
Output	**4-20mA**	**Relay**
λ_{SD} (FIT)	286,5	255,2
λ_{SU} (FIT)	19,4	9,1
λ_{DD} (FIT)	1248,1	1154,1
λ_{DU} (FIT)	12,3	115,7
λ (FIT)	1566,3	1534,1
DC_D	99,03%	90,89%
SFF	99,22%	92,46%
PFH	1,23E-08	1,16E-07
PFD_{avg}	8,41E-05	5,39E-4

DF-TV7-V		
Output	**4-20mA**	**Relay**
λ_{SD} (FIT)	254,8	223,5
λ_{SU} (FIT)	23,5	13,1
λ_{DD} (FIT)	3833,2	3739,2
λ_{DU} (FIT)	14,4	117,9
λ (FIT)	4125,8	4093,6
DC_D	99,63%	96,94%
SFF	99,65%	97,12%
PFH	1,44E-08	1,18E-07
PFD_{avg}	1,56E-04	6,10E-04

3. Assessment

The assessment of the safety functions in accordance with IEC 61508 ed 2. The assessment results are detailed in the report referenced: Ineris - 202915 - 2563476 – v 1 and audit report DRA-21-202916-00213A.

INERIS certifies that, for the configurations, proof test intervals and mode of operation listed in the present certificate, and for the related indicated SIL:

- the IEC 61508 standard hardware requirements are met;
- the IEC 61508 standard probability of failure requirement are reached;
- the IEC 61508 software safety lifecycle requirements are met;
- the validation by tests has been properly done by Teledyne Oldham Simtronics;
- required Safety integrity levels (SIL) are achieved for the safety functions listed in the certificate.

4. Safety for use

The gas detectors must be used in accordance with the configuration and usage assumptions listed in this certificate and in accordance with the supplier documents to ensure that the certified SIL remain valid

Safety for use and maintenance are described in the user guide referenced: NOSP 17661-03-NT-DF TV7_Type D-Fr-

Any modification to the above item implies to issue an amendment to this certificate.

Verneuil-en-Halatte, le 22/04/2021

The Chief Executive Officer of INERIS,
By delegation
Dominique CHARPENTIER
Certification Manager

INERIS France

Signé électroniquement
Digitally signed by
Dominique CHARPENTIER
Certification Manager /
Responsable Certification