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CERTIFICATE

[1] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE

[2] **Component intended for use on/in equipment or protective system intended for use in potentially explosive atmospheres Directive 2014/34/EU**

[3] Supplementary EU-Type Examination Certificate number:

CESI 13 ATEX 039 U /03

[4] Component: **Ring-core Current Transformers series AOC Ex**

[5] Manufacturer: **F.T.M. S.r.l.**
Fabbrica Trasformatori di Misura

[6] Address: **Via Po, 3**
20073 Opera (MI)
Italy

[7] This supplementary certificate extends EC–Type Examination CESI 13 ATEX 039 U, to apply to Component designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

[8] CESI, notified body n. 0722 in accordance with Article 17 of the Directive 2014/34/EU of the Parliament and Council of 26 February 2014, certifies that this Component has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of components intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report n. EX-C4012804.

[9] In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

[10] The sign "U" placed after the certificate number indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified Component in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this Component. These are not covered by this certificate.

[12] The marking of the Component shall include the following:

II 2G Ex eb IIC Gb

Date 2024/09/19 - Translation issued on 2024/09/19

Prepared	**Verified**	**Approved**
Enrico RADAELLI	Alessandro FEDATO	Roberto PICCIN

[13] # Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 039 U /03**

[15] **Description of the variation to the Component**

With this third supplement of the certificate, no constructive changes are made to the component.
Compared to the previous issue, the following changes have been applied:

- New AOC Ex 80 current transformers with transformation ratio 350/5 A/A and 500/5 A/A were added.

Description of Component

The current transformers (CT), series AOC Ex, subject of this certificate, are toroidal transformers for *measurement* (accuracy class from 0.2% to 3%) or *protection* (accuracy class 5P ÷ 10P and PX).
The component, in subject, constitutes the secondary circuit of the current transformer and consists of an enamelled copper winding wound on a toroidal magnetic core, the whole embedded in polyurethane resin; the primary circuit, on which the current measurement has to be done, is realized with a cable or bar crossing the toroid.
The sizing and installation of the primary circuit (cable or bar) is under the responsibility of the user, in accordance with the standard EN IEC 60079-7.
The current transformers, series AOC Ex, are *components* designed to be installed inside electrical equipment that must ensure suitable IP protection (not less than IP54). The ambient temperature (at the point of installation of the CT, inside the protective enclosure) must not exceed 70°C.

The current transformers, series AOC Ex, are identified by a code consisting of the following elements:

AOC Ex*nnn*

Where:

- **AOC Ex** identifies the series of current transformers;
- ***nnn*** identifies the inner diameter of the transformer (in mm) through which the primary circuit passes: **45÷110**;

Electrical characteristics

The specific electrical characteristics of the components are shown on their plates and in the accompanying documentation, according with the industrial standards EN 61869-1 and EN 61869-2.

The overall electrical characteristics of the current transformers series **AOC Ex** are shown below:

Current transformer (CT) type:	*AOC Ex nnA / 1A*	*AOC Ex80 50/5 A/A*	*AOC Ex105 600/5 A/A*
Rated primary current I_{pn}:	from 50 to 1000 [A]	50 [A]	600 [A]
Rated secondary current I_{sn}:	1 [A]	5 [A]	5 [A]
Rated frequency:	50 – 60 [Hz]		
Rated maximum power (burden):	30 max. [VA]	10 [VA]	25 [VA]
Accuracy class [#]: • CT for Measure: • CT for Protection:	0.2 % ÷ 1% 5P÷10P/limit factor 5÷30 *or* PX/Ek max. 900 V (*)	0.5 % ÷ 3% 10P/limit factor 5÷20 *or* PX/Ek max. 29 V (*)	0.2 % ÷ 3% 5P÷10P/limit factor 5÷20 *or* PX/Ek max. 90V (*)
Rated insulation voltage / insulation level:	0.72 / 3 [kV]		
Maximum continuous thermal current (Extended):	1.2 (I_{pn})		
Insulation class:	A		
Rated short-time thermal current (I_{th}):	max. 280 (I_{pn}) [kA per 1 sec]	10 [kA per 1 sec]	35 [kA per 1 sec]
Rated dynamic current (I_{dyn}):	max. 2.84 (I_{th}) with max. 99.5 [kA peak]	28 [kA peak]	99.5 [kA peak]
Short-circuit current of the electrical network (I_{sc}):	0.91 (I_{th}) [kA]		
Ambient temperature:	-40 ÷ +70 [°C]		

[#] The specific values are reported in the plate. *(*) "Rct" and "Ie" values are reported in the plate.*

[13] **Schedule**

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 039 U /03**

Electrical characteristics *(follow)*

Current transformer (CT) type:	*AOC Ex80 350/5 A/A*	*AOC Ex80 500/5 A/A*
Rated primary current I_{pn}:	350 [A]	500 [A]
Rated secondary current I_{sn}:	5 [A]	5 [A]
Rated frequency:	50 – 60 [Hz]	
Rated maximum power (burden):	30 [VA]	
Accuracy class [#]: • CT for Measure: • CT for Protection:	0.2 % ÷ 3% 5P÷10P/ limit factor 5÷30 *or* PX/Ek max. 60 V (*)	0.2 % ÷ 3% 5P÷10P/ limit factor 5÷30 *or* PX/Ek max. 90 V (*)
Rated insulation voltage / insulation level:	0.72 / 3 [kV]	
Maximum continuous thermal current (Extended):	1.2 (I_{pn})	
Insulation class:	A	
Rated short-time thermal current (I_{th}):	35 [kA per 1 sec]	
Rated dynamic current (I_{dyn}):	max. 2.84 (I_{th}) with max. 99.5 [kA peak]	
Short-circuit current of the electrical network (I_{sc}):	0.91 (I_{th}) [kA]	
Ambient temperature:	-40 ÷ +70 [°C]	

[#] The specific values are reported in the plate *(*) "Rct" and "Ie" values are reported in the plate*

[16] **Report n. EX-C4012804.**

Routine tests

The manufacturer shall carry out the routine tests prescribed by paragraphs 7.1 and 7.3 of the standard EN 60079-7.

The following dielectric tests shall be carried out according with the standards EN 61869-1 and EN 61869-2:

- power-frequency withstand on the secondary winding at 3 kV rms;
- inter-turn overvoltage test on the secondary winding with test current value of 1.2 x I_{pn}.

[13] # Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 039 U /03**

[17] **Schedule of limitations**

- To complete the increased safety protection (Ex e) of the current transformers, series AOC Ex, they must be installed inside an enclosure capable of guaranteeing IP54 protection, in accordance with the standard EN IEC 60079-7.
- The ambient temperature at the installation point of the current transformers, inside the protective enclosure, must remain within the range: $-40°C \leq T_{amb} \leq +70°C$.
- During operation of the transformer, the secondary winding must always be connected to a load.
- For CTs with transformation ratio nn/1 A/A, the maximum overtemperature of the secondary winding is not higher than 20K, considering the heating in continuous service at 1.2 I_{pn}, and not higher than 30K, with heating due to the short-time thermal current (I_{th} x 1 sec.).
- For CTs type AOC Ex80 50/5 A/A, the maximum overtemperature of the secondary winding is not higher than 10K, considering the heating in continuous service at 1.2 I_{pn}, and not higher than 65K, with heating due to the short-time thermal current (I_{th} x 1 sec.).
- For CTs type AOC Ex80 350/5 A/A, the maximum overtemperature of the secondary winding is not higher than 10K, considering the heating in continuous service at 1.2 I_{pn}, and not higher than 30K, with heating due to the short-time thermal current (I_{th} x 1 sec.).
- For CTs type AOC Ex80 500/5 A/A, the maximum overtemperature of the secondary winding is not higher than 15K, considering the heating in continuous service at 1.2 I_{pn}, and not higher than 15K, with heating due to the short-time thermal current (I_{th} x 1 sec.).
- For CTs type AOC Ex105 600/5 A/A the maximum overtemperature of the secondary winding is not higher than 20K, considering the heating in continuous service at 1.2 I_{pn}, and not higher than 10K, with heating due to the short-time thermal current (I_{th} x 1sec.).
- The primary conductor of the current transformer must guarantee compliance with the temperature class in service foreseen for the user equipment, considering the maximum ambient temperature, heating due to continuous service and heating due to short-time thermal current I_{th} ($\leq I_{th}$ limit of the CT).

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

Compliance with the Essential Health and Safety Requirements (EHSR), expressed by directive 2014/34/UE, is not affected by this variation made with this supplement.

EHSR, expressed by the directive, are assured by compliance with schedule of limitations (point [17]), safety instructions, supplied by the manufacturer with the component, and by compliance of the component with the following standards:

EN IEC 60079-0: 2018	Explosive atmospheres - Part 0: Equipment - General requirements
EN IEC 60079-7: 2015 + A1:2018	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

In addition to the standards above, the component, under the responsibility of the manufacturer, must meet the requirements of the standards: EN 61869-1 and EN61869-2.

[13] **Schedule**

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 039 U /03**

[19] **Descriptive documents (prot. EX-C4012807)**

- * Technical note of the extension doc. n. DT301/24	(6 pages)	dated 2024/07/24
- Technical note nr. DT118/13	(16 pages)	dated 2013/06/18
- Technical note of the extension doc. n. DT235/21	(2 pages)	dated 2021/12/17
- General instructions doc. n. DT119/13 rev. B	(6 pages)	dated 2021/12/17
- * New models instructions doc. n. DT162/16 rev. B	(8 pages)	dated 2024/07/24
- * Drawing n. 62076 (type AOC Ex80)		dated 2024/07/20
- Drawing n. 62039 (type AOC Ex45)		dated 2013/03/19
- Drawing n. 62040 (type AOC Ex55)		dated 2013/03/19
- Drawing n. 62041 (type AOC Ex80)		dated 2013/03/19
- Drawing n. 62042 (type AOC Ex80)		dated 2013/03/19
- Drawing n. 62043 (type AOC Ex80)		dated 2013/03/19
- Drawing n. 62044 (type AOC Ex80)		dated 2013/03/19
- Drawing n. 62045 (type AOC Ex80)		dated 2013/03/19
- Drawing n. 62046 (type AOC Ex80)		dated 2013/03/19
- Drawing n. 62047 (type AOC Ex80)		dated 2013/03/21
- Drawing n. 62048 (types AOC Ex85 ÷ AOC Ex110)		dated 2013/03/19
- Drawing n. 62053 (type AOC Ex80 ratio 50/5 A/A)		dated 2016/03/16
- Drawing n. 62054 (type AOC Ex80 ratio 50/5 A/A)		dated 2016/03/16
- Drawing n. 01319/1 rev. B (secondary junction block)		dated 2013/05/20
- Drawing n. 01279 rev. B (junction box clamp)		dated 2013/05/20

*Note: an * is placed before the title of documents which are new or revised, annexed to this supplement*
One copy of all documents mentioned above is kept in CESI files.

Certificate history

Issue N.	*Issue Date*	*Summary description of variations*
03	current	added 2 new AOC Ex80 current transformers with transformation ratio 350/5 A/A and 500/5 A/A:
02	17/01/2022	Standards updating and correction, in the marking plate, of the printing position of the Notified Body code
01	20/05/2016	Standards updating and new CT models with ratio 50/5 A/A and 600/5 A/A
00	25/07/2013	First issue of the certificate