

IECEX TEST REPORT COVER



| | | |
|-------------------------------------|---|--|
| ExTR Reference Number | CH/SEV/ExTR12.0007/01 | |
| ExTR Free Reference Number | 09-IK-0051.42 E1 | |
| Compiled by + signature (ExTL) | Urban Strebel Product Qualification | |
| Reviewed by + signature (ExTL).... | Stefan Hartmann Product Qualification | |
| Approved by + signature (ExCB) ... | Martin Plüss Product Certification Manager | |
| Date of issue | 2017-03-07 | |

| | | | |
|-----------------------------|--|--|--|
| CB Testing Laboratory | Electrosuisse | | |
| Address | Luppenstrasse 1, CH-8320 Fehraltorf Switzerland | | |

STS 001

| | |
|-----------------------------------|--|
| Ex Certification Body (ExCB)..... | Electrosuisse |
| Address | Luppenstrasse 1, CH-8320 Fehraltorf, Switzerland |
| Applicant's name..... | Trafag AG |
| Address | Industriestrasse 11, 8608 Bubikon, SWITZERLAND |

| | |
|---|---|
| Standards associated with this ExTR package | IEC 60079-0:2011, 6 th Edition; IEC 60079-11:2011, 6 th Edition IEC 60079-26:2014, 3 rd Edition |
|---|---|

| | |
|-------------------------|------------------------|
| Clauses considered..... | All clauses considered |
|-------------------------|------------------------|

| | |
|----------------------------------|---|
| Test procedure..... | IECEX System (incl. group differences for ATEX) |
| Test Report Form Number..... | ExTR Cover_4 (released 2010-12) |
| Test item description | Pressure sensing device |
| Model/type reference | 8854.xx, 8859.xx |
| Code (e.g. Ex __ II__ T__) | See at general product information |
| Rating | $U_i \leq 28V$, $I_i \leq 93mA$, $P_i \leq 0.65W$, $C_i = 12 nF$, $L_i = 1.25 mH$ |

| | |
|-------------------------------------|---|
| All testing fully performed by ExTL | YES |
| staff at ExTL address above: | (Yes / No, See below for additional details.) |

Instructions for Intended Use of ExTR Cover:
An ExTR Cover is the sole top-level document to associate together all other parts of an IECEx Test Report (ExTR) package. An ExTR package is comprised of an ExTR Cover and one or more associated ExTR documents (which may include Ex Test Reports, ExTR Addendums and ExTR of National Differences). All ExTR package documents are compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the overall ExTR package on this ExTR Cover.

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Manufacturer's name: STS Sensortechnik Sirmach AG
 Address: Rütihofstrasse 8, CH-8370 Sirmach
 Trademark: ---

Particulars: Test item vs. Test requirements

Classification of installation and use: stationary
 Ingress protection: IP6X
 Rated ambient temperature range (°C).....: See table below

General remarks:

The test results presented in this ExTR package relate only to the item or product tested.

- "(see Attachment #)" refers to additional information appended to the ExTR package.
- "(see appended table)" refers to a table appended to the ExTR package.
- Throughout this ExTR package, a point is used as the decimal separator.
- *Where the term "N/A" appears in any part of an ExTR package, it indicates that the associated issue was considered "Not applicable" to the involved evaluation.*
- *In accordance with IECEx 02, a Receiving ExCB may request a sample of the Ex equipment and copies of the documentation referred to in an ExTR Cover.*

The technical content of this ExTR package shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

Copy of Marking Plate:

Copy of Marking Plate: The samples contain type designation ATM.xxx/ which is replaced by "ATM.1ST" or "ATM.ECO" on the real sensors. The reduced marking is applied acc. to clause 29.10 of IEC 60079-0. For reference only.



Legend:

xx = Product type
 nnnnnnn = Serial number (e.g. 9876541)
 cw = Calendar week of production (e.g. 01)
 yyyy = Year of production (e.g. 2016)
 hhh = housing material (SST or Ti)

More details see at the instruction manual:

Example for more details:

Identification for transmitter with cable outlet or metallic connector:

| | |
|--|------------------------------|
| | II 1G Ex ia IIC T3 ... T6 Ga |
| | II 1D Ex ia IIC T145 °C Da |
| | I M1 Ex ia I Ma |

Identification for other transmitters:

| | |
|--|------------------------------|
| | II 2G Ex ia IIB T3 ... T6 Gb |
| | II 1D Ex ia IIC T145 °C Da |
| | I M2 Ex ia I Mb |

Application schema

Explosionsgefährdeter Bereich

Nicht-explosionsgefährdeter Bereich

8854.xx, 8859.xx
 Drucktransmitter
 mit O-Ring, geschweisst oder
 elastomerfreie Variante

Zenerbarriere

Vmax (Ui) = 28 V
 Imax (Ii) = 93 mA
 Pi = 0.65 W
 Ci = 12 nF
 Li = 1.25 mH
 Ccable = 0.12 nF/m
 Lcable = 0.001 mH/m

+Vin

Pout

EP

Voc (Uo) ≤ 28 V
 Isc (Io) ≤ 93 mA
 Po ≤ 0.65 W
 Ca ≥ 12 nF + Ccable
 La ≥ 1.25 mH + Lcable

General product information:

The sensor series 8854.xx and 8859.xx... are pressure sensors for gasses or liquids designed according to requirements Ex ia.

The temperature class depends on ambient-temperature and medium-temperature on the sensor. This relations are shown in the following tables:

| | | | | |
|--------------|--------------------------|----|-----|-----|
| Type 8854.xx | Temperature class | T6 | T4 | T3 |
| | Ambient temperature [°C] | 50 | 85 | 125 |
| | Medium temperature [°C] | 50 | 110 | 150 |
| Type 8859.xx | Temperature class | T6 | T4 | T3 |
| | Ambient temperature [°C] | 50 | 80 | 80 |
| | Medium temperature [°C] | 50 | 80 | 80 |

The relationship between the max. ambient temperature and surface temperature for dust environment is shown in the following table:

| | | | |
|--------------------------|----|----|-----|
| Ambient temperature [°C] | 50 | 60 | 125 |
| Surface temperature [°C] | 70 | 80 | 145 |

See also Risk-analysis and Operating- and Safety- instructions 10.88.0092. from STS

Sensors with plug connection are delivered without the cable and the connector's counterpart. The end-user must install correct connector type and cable for the appliance and must check that no additional ignition risks occur with these parts.

The manual contains information about the risks of materials of the connector.

Code (e.g. Ex __ II__ T__):

Only versions with cable outlet (cable jacket with metal mesh) or metallic plug.

Ex ia IIC T3 ...T6 Ga

Ex ia IIIC T145 °C Da

Ex ia I Ma

For all other versions:

Ex ia IIB T3 ...T6 Gb

Ex ia IIIC T145 °C Da

Ex ia I Mb

Remark : Without the European Group Ex code marking the code (same) is unclear for the different types.. Therefore it would be better if is not used the alternative name design by IEC 60079-0: 2012. Better use equipment protection level (Ga for first group types, Gb for the others).

In accordance with OD 024, testing not fully performed by ExTL staff at the above ExTL address:

YES

National differences considered as part of this evaluation, if any:

- The common European group differences are reported and appended in this report.
- The common European group differences for the type of protection are reported and appended in the specific report.

“Conditions of Use” for Ex Equipment or “Schedule of Limitations” for Ex Components, if any:

Pressure transmitters made with titanium housing must be adequately protected by appropriate measures in addition to mechanically generated impact and friction sparks.

Routine tests, if any:

The routine test and/or necessary tests must be carried out by the manufacturer in order to verify that the design, components and materials of each produced device correspond with the test documents.

Additional information:

The pressure transmitter Trafag 8854.xx and 8859.xx measure the signal of a piezo-resistive pressure measurement bridge and converts it into a standard signal. Input and signal transmission take place via an intrinsically safe three-wire 4-20 mA current loop circuit.

8854.xx are types featuring a screw-in flange, 8859.xx represent dive probes.

Type Description

Placeholders "xx" stand for the accuracy level of the sensor exhibits. They do not have any impact on explosion protection and general security.

Assessment data

Measurement and power supply circuit of the ignition protection type intrinsic security Ex ia IIC, Ex ia IIIC and Ex ia I is only for connection to a certified and intrinsically safe electric circuit.

The pressure transmitter must be connected to a intrinsic safety certified barrier.

Maximum ratings:

| | | |
|-------|--------|--------|
| U_i | \leq | 28 V |
| I_i | \leq | 93 mA |
| P_i | \leq | 0.65 W |

| | |
|---|--------------------------|
| Effective internal capacitance | $C_i = 12 \text{ nF}$ |
| plus per meter length of connecting cable | $C_K = 0.12 \text{ nF}$ |
| Effective internal inductance | $L_i = 1.25 \text{ mH}$ |
| plus per meter length of connecting cable | $L_K = 0.001 \text{ mH}$ |

Verification of intrinsically safe circuit:

With the usage of the Trafag sensor cable types "cable relative PUR" and "cable relative FEP" a maximum cable length up to 300 m is allowed even the abovementioned values of maximum permissible capacitance and inductance are greater than mentioned. This type of installation with cables up to 300 m was assessed as complete intrinsically safe system itself.

| Related Test Reports etc. | | | |
|---|-----------------------|--------------|------------|
| Title: | Reference Number: | No. of pages | Date: |
| IEC 60079-0 (General requirements) | CH/SEV/ExTR10.0003/01 | 15 | 2014-01-15 |
| IEC 60079-11 (Intrinsic safety "i"); | CH/SEV/ExTR10.0003/01 | 15 | 2014-01-15 |
| IEC 60079-26 (Requirements for EPL Ga) | CH/SEV/ExTR10.0003/01 | 7 | 2014-01-15 |
| Report of measurement spark ignition test | CH/SEV/ExTR10.0003/01 | 7 | 2014-01-15 |
| Appendix Photo | CH/SEV/ExTR10.0003/01 | 3 | 2014-01-15 |
| IEC cover Trafag AG | CH/SEV/ExTR12.0007/00 | 7 | 2012-12-04 |
| IECEX Test Report Cover | CH/SEV/ExTR10.0003/02 | 6 | 2016-07-13 |
| Addendum | CH/SEV/ExTR10.0003/02 | 2 | 2016-07-13 |
| Addendum | CH/SEV/ExTR12.0007/01 | 2 | 2017-03-07 |

| Manufacturer's Documents | | | | |
|--|---------------|--------------|-------------|-------|
| Title: | Document No.: | No. of pages | Rev. Level: | Date: |
| Same as before: See the list at Ex test report cover 09-IK-0051.03 date 2014-01-14 | | | | |

The above listed documents are provided with a stamp Electrosuisse dated 15.01.14.

| Manufacturer's Documents | | | | |
|--|---------------------|--------------|-------------|------------|
| Title: | Document No.: | No. of pages | Rev. Level: | Date: |
| Same as before: See the list at Ex test report cover 09-IK-0051.03 date 2014-01-14 | | | | |
| Operating and safety instruction manual | 10.88.0440.A_DMM045 | 1 | A | 2016-10-30 |
| Marking plate for types 8854.xx and 8859.xx | 9.99.0134.B | 1 | --- | 2016-11-23 |










EUROPEAN GROUP DIFFERENCES ATEX

Used Standards

EN 60079-0:2012 + A11:13, EN 60079-11:2012, EN 60079-26:2015; EN 50303:2000

ATEX Marking according to directive RL2014/34/EU

| | | |
|--|---|------|
| - Name and address of the manufacturer | OK | PASS |
| - CE marking | OK | PASS |
| - designation of series or type | OK | PASS |
| - serial number, if any | OK | PASS |
| - year of construction | OK | PASS |
| - the specific marking of explosion protection  followed by the symbol of the equipment group and category, | OK | PASS |
| - for equipment-group II, the letter 'G' (concerning explosive atmospheres caused by gases, vapours or mists), and/or the letter 'D' (concerning explosive atmospheres caused by dust). | <p>Only versions with cable outlet (cable jacket with metal mesh) or metallic plug.</p> <p> II 1G Ex ia IIC T3 ...T6 Ga</p> <p> II 1D Ex ia IIIC T145 °C Da</p> <p> I M1 Ex ia I Ma</p> <p>(complete code including Europ. Deviation)</p> <p>For all other versions:</p> <p> II 2G Ex ia IIB T3 ...T6 Gb</p> <p> II 1D Ex ia IIIC T145 °C Da</p> <p> I M2 Ex ia I Mb</p> <p>(complete code including Europ. Deviation)</p> <p>See Operating and safety instructions for different configurations and applications</p> | PASS |

Conformity with the documentation

The manufacturer shall carry out the verifications or tests necessary to ensure that the electrical equipment produced complies with the documentation.

Routine test

The manufacturer shall also carry out any routine tests required by any of the standards listed in EN 60079-0 Clause 1 which were used for the examination and testing of the equipment.





Additional Narrative Remarks to ATEX (as deemed applicable)

The test report 09-IK-0051.02 ATM.xxx/Ex, ATM.xxx/N/Ex EN 50303 (file description 09-IK-0051.02 STS ATM_Ex EN 50303) is only valid for ATEX Certification.



IECEx TEST REPORT ADDENDUM



| | | |
|-------------------------------------|---|---|
| ExTR Reference Number | CH/SEV/ExTR12.0007/01 | |
| ExTR Free Reference Number | 09-IK-0051.42 E1 | |
| Compiled by + signature (ExTL) | Urban Strebel Product Qualification |  |
| Reviewed by + signature (ExTL) | Stefan Hartmann Product Qualification |  |
| Date of issue | 2017-03-07 | |
| CB Testing Laboratory | Electrosuisse | |
| Address | Luppenstrasse 1, 8320 Fehraltorf SWITZERLAND |   |
| Applicant's name | Trafag AG | |
| Address | Industriestrasse 11, 8608 Bubikon, SWITZERLAND | |
| Standards | IEC 60079-0:2011, 6 th Edition (EN 60079-0:2012+A11:2013) IEC 60079-11:2011, 6 th Edition (EN 60079-11:2012) IEC 60079-26:2014, 3 rd Edition (EN 60079-26:2015) EN 50303:00 | |
| Test procedure | IECEx/ATEX System | |
| Test Report Form Number | ExTR Addendum_2B (released 2015-07) | |

Instructions for Intended Use of ExTR Addendum:

An ExTR Addendum is to supplement a previously issued ExTR package. Only those clauses applicable to the supplemental issue being addressed are to be tabulated and remarked upon as part of this document. An ExTR of National Differences may also supplement this document. An ExTR Addendum is to be compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the ExTR Addendum as part of the overall ExTR package on the associated ExTR Cover.

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Possible test case verdicts:

- test case does not apply to the test item : N/A
- test item does meet the requirement : Pass

General remarks:

The test results presented in this ExTR Addendum relate only to the item or product tested, and are only valid when considered together with the related Ex Test Report that was previously issued, along with any previously issued ExTR Addendums for the same item or product.

Only clauses and manufacturer's documents impacted by this document are detailed.

- "(see Attachment #)" refers to additional information appended to this document.
- "(see appended table)" refers to a table appended to this document.
- Throughout this document, a point is used as the decimal separator.

The technical content of this ExTR Addendum shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

The common European group differences to this standard are reported and appended at the end of this report.

Addendum E1 Report:

The information contained in the basic test report Ref. 09-IK-0051.03 issued 15-01-2014 remains unchanged, followed with Ref. 09-IK-0051.03 E1 13-07-2016 issued with the exception of the sections and reports specified below, and apply to this addendum.

| IEC 60079-26:2007 edition 2.0 to IEC 60079-26:2014 edition 3.0 | | | |
|---|---|---|---------|
| Clause | Requirement – Test | Result – Remark | Verdict |
| 4.1.3.2 | Requirement for separation element detailed regarding external influences | See at the test report "ExTR10.0003/01 of 09-IK-0051.03 IEC 60079-26 clause 4.2.5.2 partition wall: Intrinsic safety as a sole means of protection. | Pass |
| 4.3 | Process connections requires a sufficiently tight joint: IP66 added alternatively to IP67 | See at the test report "ExTR10.0003/01 of 09-IK-0051.03 IEC 60079-26 clause 4.6.: Versions are intended for installation in the boundary wall between an area requiring EPL Ga and less hazardous areas. Standardized process connections are used (Sentence was easily corrected). | Pass |
| 5.2 | Test of partition walls according to 4.1.3.2 b) is specified in more detail | See at the test report "ExTR10.0003/01 of 09-IK-0051.03 IEC 60079-26 clause 4.6.: Not used | N/A |
| 7 | Specification of material of partition wall required in instructions (also required in 4.1.3.2) | The sensors have intrinsic safety as a sole means of protection. The sensors do not have a partition wall within the meaning of this standard or by this clause 7. | N/A |

Measurement Section, including Additional Narrative Remarks (as deemed applicable)

See at the test report cover 09-IK-0051.03 related Test reports.

**EUROPEAN GROUP DIFFERENCES ATEX**

See at the test report cover 09-IK-0051.42 E1.