IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	**IECEx CML 23.0096X**	Page 1 of 3	Certificate history:
Status:	**Current**	Issue No: 0	
Date of Issue:	2023-09-06		
Applicant:	**METRIX INSTRUMENT CO.** 8824 Fallbrook Houston TEXAS 77064 USA **United States of America**		
Equipment:	**Vibration transmitter type ST5484E-***-****-** and Vibration switches type SW5484E-***-****-****		
Optional accessory:			
Type of Protection:	**Intrinsic Safety Ex "i", Flameproof Ex "d", Increased Safety Ex "e"**		
Marking:	Ex ia IIC T4 Ga Ta = -40 °C to +100 °C Ex db IIC T* Gb where T4: Ta = -40°C to +100°C T6: Ta = -40°C to +73°C Ex ec IIC T* Gc where T4: -40°C ≤ Tamb ≤ +100°C T6: -40°C ≤ Tamb ≤ +73°C		

Approved for issue on behalf of the IECEx Certification Body:	**Ben Trafford**
Position:	**Certification Officer**
Signature: (for printed version)	
Date: (for printed version)	2023-09-06

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Eurofins E&E CML Limited
Unit 1, Newport Business Park
New Port Road
Ellesmere Port, CH65 4LZ
United Kingdom

METRIX DOC NO: 1185352
REV: D

IECEx Certificate of Conformity

Certificate No.: **IECEx CML 23.0096X** Page 2 of 3

Date of issue: 2023-09-06 Issue No: 0

Manufacturer: **METRIX INSTRUMENT CO.**
8824 Fallbrook
Houston
TEXAS 77064
USA
United States of America

Manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

GB/CML/ExTR23.0131/00

Quality Assessment Report:

GB/BAS/QAR10.0017/08

METRIX DOC NO: 1185352
REV: D

IECEx Certificate of Conformity

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Vibration transmitter type ST5484E-*-****-** (Ex ia IIC T4 Ga)**

The **ST5484E Vibration Transmitter** is used to detect vibration level of machine. It provides an output current in the range 4-20 mA proportional to the vibration level.

Vibration transmitters type ST5484E–*–****–** & Vibration switches type SW5484E–***–****–** (Ex db IIC T* Gb)**

The **ST5484E Vibration Transmitter** is used to detect vibration level of machines and combines an accelerometer and a signal conditioner in a single unit. It provides an output a current in the range 4-20 mA, proportional to the vibration level. Additionally, it can also be provided with an optional dynamic output.

The **SW5484E Vibration Switch** adds switching features, when compared to the **ST5484E Vibration Transmitter** which can be used in auto-shutdown circuit that trips the machine under high vibration conditions.

Vibration transmitters type ST5484E–*–****–** & Vibration switches type SW5484E–***–****–** (Ex ec IIC T* Gc)**

The **ST5484E Vibration Transmitter** is used to detect vibration level of machines and combines an accelerometer and a signal conditioner in a single unit. It provides an output a current in the range 4-20 mA, proportional to the vibration level. Additionally, it can also be provided with an optional dynamic output.

The **SW5484E Vibration Switch** adds a switching feature, when compared to the **ST5484E Vibration Transmitter** which can be used in auto-shutdown circuit that trips the machine under high vibration conditions.

SEE ANNEX for DETAILS

SPECIFIC CONDITIONS OF USE: YES as shown below:
SEE ANNEX for DETAILS

Annex:

Certificate Annex IECEx CML 23.0096X Issue 0.pdf

METRIX DOC NO: 1185352
REV: D

Annexe to:	IECEx CML 23.0096X Issue 00
Applicant:	Metrix Instrument Co.
Apparatus:	Vibration transmitter type ST5484E-***-****-** and Vibration switches type SW5484E-***-****-**

Description

Vibration transmitter type ST5484E-***-****-** (Ex ia IIC T4 Ga)

The **ST5484E Vibration Transmitter** is used to detect vibration level of machine. It provides an output current in the range 4-20 mA proportional to the vibration level.

The sensor printed circuit boards are installed inside a stainless-steel enclosure which may be optionally mounted on an 8200 series Killark metallic enclosure. The entire sensor unit is encapsulated.

The equipment provides different connection types: 2 or 4-wire flying leads, 2 or 4-pin terminal block, 2-pin MIL terminal.

The equipment must be installed per drawing 9278.

Ratings

Vibration transmitter - Type : ST5484E-AAA-BBCD-EF

Intrinsic safety electrical parameters:

Ui:	29.6 V
Ii:	100 mA
Pi:	0.75 W
Ci:	70 nF
Li:	0.6 uH

Eurofins E&E CML Limited
Newport Business Park
New Port Road
Ellesmere Port
CH65 4LZ

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E info@cmlex.com

www.cmlex.com

Company Reg No. 8554022 VAT No. GB163023642

Vibration transmitters type ST5484E–***–****–** & Vibration switches type SW5484E–***–****–** (Ex db IIC T* Gb)

The **ST5484E Vibration Transmitter** is used to detect vibration level of machines and combines an accelerometer and a signal conditioner in a single unit. It provides an output a current in the range 4-20 mA, proportional to the vibration level. Additionally, it can also be provided with an optional dynamic output.

The **SW5484E Vibration Switch** adds a switching feature, when compared to the **ST5484E Vibration Transmitter** which can be used in auto-shutdown circuit that trips the machine under high vibration conditions.

Each device consists of a stainless-steel cylindrical housing, with 1 inch NPT external thread.

Printed circuit boards are mounted in the metallic housing and filled with potting compound to totally encase the electronics. The device is secured into a certified conduit capped elbow of type Y-3-EX from Killark that provides the flameproof protection.

The electrical connections to the ST5484E Vibration Transmitter are either:

- 2-Pin or 4-Pin terminal block, or
- Flying leads (2-wire or 4-wire),

A terminal block may also be mounted inside the conduit capped elbow to facilitate electrical connections.

The **SW5484E Vibration Switch** has a permanent cable (flying leads).The cable entry has a 5 K thermal rise above the ambient operating temperature of the device.

Ratings

ST5484E–*–****–** Vibration transmitters & SW5484E–***–**8*–** Vibration switches, with conduit capped elbow**	
Supply voltage: 11-30 V DC	For SW5484E, the maximum current which can pass through each solid-state switch is 100 mA DC only.

Vibration transmitters type ST5484E–***–****–** & Vibration switches type SW5484E–***–****–** (Ex ec IIC T* Gc)

The **ST5484E Vibration Transmitter** is used to detect vibration level of machines and combines an accelerometer and a signal conditioner in a single unit. It provides an output a current in the range 4-20 mA, proportional to the vibration level. Additionally, it can also be provided with an optional dynamic output.

The **SW5484E Vibration Switch** adds a switching feature, when compared to the **ST5484E Vibration Transmitter** which can be used in auto-shutdown circuit that trips the machine under high vibration conditions.

Each device consists of a stainless-steel cylindrical housing, with 1 inch NPT external thread.

Printed circuit boards are mounted in the metallic housing and filled with potting compound to totally encase the electronics. The device is secured into a certified conduit capped elbow of type Y-3-EX from Killark that provides a degree of Ingress Protection IP66. The assembly forms the complete ST5484E transmitter.

The electrical connections to the ST5484E Vibration Transmitter are either:

With certified conduit elbow of type Y-3-EX

- 2-Pin or 4-Pin terminal block, or
- Flying leads (2-wire or 4-wire), or

Without certified conduit elbow of type Y-3-EX

- 2-Pin MIL terminal

A terminal block may also be mounted inside the conduit capped elbow to facilitate electrical connections.

The **SW5484E Vibration Switch** is provided with either an 8-Pin M12 connector (laser welded to housing), or with a permanently connected cable (flying leads and a certified cable gland. The cable entry has a 5 K thermal rise above the ambient operating temperature of the device.

Ratings

ST5484E–*–****–** Vibration transmitters & SW5484E–***–****–** Vibration switches**	
Supply voltage: 11-30 V DC	For SW5484E, the maximum current which can pass through each solid-state switch is 100 mA DC only.

Nomenclature

ST5484E Vibration Transmitter (ST5484E-AAA-BBCD-EF, with AAA, BBCD and EF)			
AAA (3 digits): Range			
Model ST5484E-		**A1**	**A2**
Peak	**RMS**		
121	151	1.0 IPS	25.4 mm/s
122	152	0.5 IPS	12.7 mm/s
123	153	2.0 IPS	50.8 mm/s
124	154	5.0 IPS	125 mm/s
126	156	0.8 IPS	20.3 mm/s
132	162	3.0 IPS	76.2 mm/s
BB (2 digits): housing material and stud size			
10-19, 30	316 SST housing, multiple stud sizes		
C (1 digit): hazardous area certification			
7	ATEX/IECEx, Ex ia IIC T4 Ga		
8	ATEX/IECEx, Ex db IIC T4 Gb (includes elbow)		
C	ATEX, Ex ec IIC T4 Gc (includes elbow when (D) = 0, 1, 2, 3, 5, or 6		
D	IECEx, Ex ec IIC T4 Gc (includes elbow when (D) = 0, 1, 2, 3, 5, or 6		
D: Connection type			
0	24”Flying Leads, 2-wire (4-20 mA output only)		
1	24”Flying Leads, 4-wire (4-20 mA output and dynamic raw acceleration signal)		
2	Terminal Block, 2-wire (4-20 mA output only)		
3	Terminal Block, 4-wire (4-20 mA outputand dynamic raw acceleration signal)		
4	2-Pin MIL-style (4-20 mA output only)		
5	72”Flying Leads, 2-wire (4-20 mA output only)		
6	72”Flying Leads, 4-wire (4-20 mA output and dynamic raw acceleration signal)		
6	10 meter (33 feet) Flying leads, 8-wire (when option C = C or D)		
7	5 meter (16.5 feet) Flying leads, 8-wire (when option C = C or D)		

ST5484E Vibration Transmitter (ST5484E-AAA-BBCD-EF, with AAA, BBCD and EF)	
8	88-Pin M12 (when option C = C or D)
E : high pass (-3db)	
0	2 Hz
1	5 Hz
2	10 Hz
3	20 Hz
4	50 Hz
5	100 Hz
6	200 Hz
X	CUSTOM
F : low pass (-3db)	
0	1500 Hz
1	500 Hz
2	1000 Hz
3	2000 Hz
4	250 Hz
5	230 Hz
X	CUSTOM

SW5484E Vibration Switch (SW5484E-AAA-BBCD-EF, with AAA, BBCD and EF)			
AAA (3 digits): range			
Model SW5484E-		**A1**	**A2**
Peak	**RMS**		
121	151	1.0 IPS	25.4 mm/s
122	152	0.5 IPS	12.7 mm/s
123	153	2.0 IPS	50.8 mm/s
124	154	5.0 IPS	125 mm/s
126	156	0.8 IPS	20.3 mm/s
132	162	3.0 IPS	76.2 mm/s
BB (2 digits): housing material and stud size			
10-19, 30	316 SST housing, multiple stud sizes		
C (1 digit): hazardous area certification			
8	ATEX/IECEx Ex db IIC T4 Gb (explosion proof, includes Y-3-EX capped elbow)		
C	ATEX, Ex ec IIC T4 Gc		
D	IECEx, Ex ec IIC T4 Gc		
D: Connection type			
0	24”Flying Leads, 2-wire (4-20 mA output only)		
1	24”Flying Leads, 4-wire (4-20 mA output and dynamic raw acceleration signal)		
2	Terminal Block, 2-wire (4-20 mA output only)		
3	Terminal Block, 4-wire (4-20 mA outputand dynamic raw acceleration signal)		
4	2-Pin MIL-style (4-20 mA output only)		
5	72”Flying Leads, 2-wire (4-20 mA output only)		
6	72”Flying Leads, 4-wire (4-20 mA output and dynamic raw acceleration signal)		
6	10 meter (33 feet) Flying leads, 8-wire (when option C = C or D)		
7	5 meter (16.5 feet) Flying leads, 8-wire (when option C = C or D)		
8	88-Pin M12 (when option C = C or D)		
E : high pass (-3db)			

SW5484E Vibration Switch (SW5484E-AAA-BBCD-EF, with AAA, BBCD and EF)	
0	2 Hz
1	5 Hz
2	10 Hz
3	20 Hz
4	50 Hz
5	100 Hz
6	200 Hz
X	CUSTOM
F : low pass (-3db)	
0	1500 Hz
1	500 Hz
2	1000 Hz
3	2000 Hz
4	250 Hz
5	230 Hz
X	CUSTOM

Ratings

ST5484E Vibration Transmitter: Ex ia IIC T4 Ga

Intrinsic safety electrical parameters:	Ui:	29.6 V
	Ii:	100 mA
	Pi:	0.75 W
	Ci:	70 nF
	Li:	0.6 µH

ST5484E Vibration Transmitter and SW5484E Vibration Switch: Ex dB IIC T4 Gb

Supply voltage:	11-30 VDC
For SW5484E, the maximum current which can pass through each solid-state switch is 100 mA DC only.	

ST5484E Vibration Transmitter and SW5484E Vibration Switch: Ex ec IIC T4 Gc

Supply voltage:	11-30 VDC
For SW5484E, the maximum current which can pass through each solid-state switch is 100 mA DC only.	

Conditions of Manufacture

All versions

i. Where the product incorporates certified parts or safety critical components, the manufacturer of the product defined on this certificate shall continually monitor these parts/components for any modifications introduced by the manufacturer(s) of these constituent parts. If the manufacturer of any constituent part introduces any changes which affect the compliance of the certified product that is the subject of this certificate, the manufacturer is required to have this certificate updated.

Vibration transmitters type ST5484E–***–****–** & Vibration switches type SW5484E–***–****–** (Ex ec IIC T4 Gc):

ii. In accordance with clause 7.1 of standard IEC 60079-7, each product manufactured shall be subjected to a dielectric strength test at 500 V a.c. for 1 minute. Alternatively, the test may be carried out at 600 V a.c. for 100 ms. No breakdown shall occur.

Specific Conditions of Use

Vibration transmitter type ST5484E-***-****-** (Ex ia IIC T4 Ga)

i. The intrinsically safe apparatus shall only be connected to associated intrinsically safe apparatus certified for the intended use. This association shall comply with the requirements of EN/IEC 60079-25 standard.
ii. Ambient temperature range: -40 °C to +100 °C
iii. When the optional aluminum elbow enclosure is used, the equipment must be installed in such a way that, even in the event of rare incidents, the aluminum enclosure cannot be an ignition source due to impacts or frictions.
iv. The models equipped with terminals or flying leads shall be mounted on an additional enclosure having a protection degree of at least IP20 and conform to EN/IEC 60079-0.
v. For the models equipped with additional dynamic output, this output cannot be used when the equipment is situated in hazardous area.
vi. The equipment must be installed in accordance with drawing 9278.

Vibration transmitters type ST5484E–***–****–** & Vibration switches type SW5484E–***–****–** (Ex db IIC T4 Gb)

i. The final user shall use an Ex d certified entry device at the elbow's entry while respecting the installation requirements of EN/IEC 60079-14. For ST5484E transmitters with flying leads, a flameproof entry device with sealing compound (barrier seal) shall be used.
ii. The equipment does not incorporate an external earth facility. It is the responsibility of the user to ensure adequate earth continuity.
iii. The disassembling of the device from its conduit capped elbow is not allowed.
iv. Ambient temperature range for T4 Temperature Code: -40 °C to +100 °C

Ambient temperature range for T6 Temperature Code: -40 °C to +73 °C

Vibration transmitters type ST5484E–***–****–** & Vibration switches type SW5484E–***–****–** (Ex ec IIC T4 Gc)

i. Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the device.
ii. The device does not incorporate an external earth facility. It is the responsibility of the user to ensure adequate earth continuity.
iii. For ST5484E transmitters with certified capped elbow:
- The user shall use an Ex eb certified entry device at the capped elbow's entry while respecting the installation requirements of EN/IEC 60079-14.
- Disconnect the device from supply circuit before opening the capped conduit elbow.
- The disassembling of the transmitter from its capped elbow is not allowed.

iv. For ST5484E transmitters with 2-Pin MIL connector: the mating female connector provided by the end user shall be in accordance with all applicable clauses of IEC 60079-0 and IEC 60079-7. A minimum degree of protection IP54 according to EN/IEC 60529 shall be ensured.
The mating connector shall not be connected or disconnected when energized.

v. For ST5484E transmitters with flying leads: the flying leads shall be suitably protected from impact and shall be terminated within a suitably certified enclosure or in safe area. The installation shall guarantee that no pulling force will be applied to the leads.

vi. For SW5484E with 8-Pin M12 connector: the mating female connector provided by the end user shall be in accordance with all applicable clauses of EN/IEC 60079-0 and EN/IEC 60079-7. A minimum degree of protection IP54 according to EN/IEC 60529 shall be ensured.
The mating connector shall not be connected or disconnected when energized.

vii. For SW5484E with permanent cable and separately certified cable gland: according to specific conditions of use of certificates IECEx CML 19.0062X of TRUSEAL TSMe M16x1.5 cable gland, the end user shall provide suitable additional clamping of the cable to ensure that pulling is not transmitted to the terminations.

viii. Ambient temperature range for T4 Temperature Code: -40 °C to +100 °C
Ambient temperature range for T6 Temperature Code: -40 °C to +73 °C

The following pages are the prior revisions of this certificate.

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx LCI 10.0035X**

Page 1 of 4

Certificate history:
Issue 3 (2013-11-29)
Issue 2 (2011-11-17)
Issue 1 (2011-04-11)
Issue 0 (2010-10-19)

Status: **Current**

Issue No: 4

Date of Issue: 2020-09-15

Applicant: **Metrix Instrument Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Equipment: **Vibration transmitter - Type : ST5484E-AAA-BBCD-EF**

Optional accessory:

Type of Protection: **Ex ia**

Marking:
Ex ia IIC T4 Ga

(Refer to the annex of the certificate for the full marking)

Approved for issue on behalf of the IECEx Certification Body: **Julien Gauthier**

Position: **Certification officer**

Signature: (for printed version)

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
S.A.S au capital de 15.745.984 €
RCS Nanterre B 408 363 174
33 avenue du Général Leclerc
F - 92266 FONTENAY AUX ROSES

Date: 2020-09-15

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
Fontenay-aux-Roses FR-92260
France

METRIX DOC NO: 1185352
REV: C

IECEx Certificate of Conformity

Certificate No.: **IECEx LCI 10.0035X**

Date of issue: 2020-09-15 Issue No: 4

Manufacturer: **Metrix Instrument Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Additional manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

FR/LCI/ExTR10.0037/00
FR/LCI/ExTR10.0037/01
FR/LCI/ExTR10.0037/02
FR/LCI/ExTR10.0037/03
FR/LCIE/ExTR18.0031/00

Quality Assessment Report:

GB/BAS/QAR10.0017/06

METRIX DOC NO: 1185352
REV: C

IECEx Certificate of Conformity

Certificate No.: **IECEx LCI 10.0035X** Page 3 of 4

Date of issue: 2020-09-15 Issue No: 4

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The vibration transmitter is used to detect vibration level of machine. It provides at the output a current, in the range 4-20 mA, function of the vibration level.

The sensor electronic boards are installed in a stainless steel enclosure which can be optionally monted on a 8200 series Killark metallic enclosure.

The entire sensor unit is encapsulated.

The equipment must be installed per drawing 9278.

The equipment provides different connection types: 2 or 4-wire flying leads, 2 or 4-pin terminal block, 2-pin MIL terminal.

See attachment for more details.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- The intrinsically safe apparatus shall only be connected to associated intrinsically safe apparatus certified for the intended use. This association shall comply with the requirements of IEC 60079-25 standard.
- Ambient temperature range: - 40°C to + 100°C
- When the optional aluminium elbow enclosure is used, the equipment must be installed in such a way that, even in the event of rare incidents, the aluminium enclosure cannot be an ignition source due to impacts or frictions.
- The models equipped with terminals or flying leads shall be mounted on an additional enclosure having a protection degree of at least IP20 and conform to IEC 60079-0, Edition 7.0.
- For the models equipped with additional dynamic output, this output cannot be used when the equipment is situated in hazardous area.

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Issue 00 :

Conformity assessment according to IEC 60079-0:2004 Ed 4.0 and IEC 60079-11:2006 Ed 5 standards.

Issue 01 :

Update of documents.

Issue 02 :

- Change of two EMI filters on input ports,
- Addition of a new casting compound as an alternative to thos previously used.

Issue 03 :

- Normative update according to IEC 60079-0 Ed 6.0 and IEC 60079-11 Ed 6 standards.
- Clarification of the model reference : ST5484E-XXX-Y3Z-WW or ST5484E-XXX-Y5Z-WW or ST5484E-Y7Z-WW mounted with optional conduit elbow 8200-001.

Issue 04 :

- Normative update according to IEC 60079-0 Ed. 7.0 standard
- Modification and clarification of the model reference : ST5484E-AAA-BB7D with AAA, BB, D, E and F variable parts, including the connection types as following : 2-wire or 4-wire flying leads, 2-pin or 4-pin terminal block, 2-pin MIL terminal.
- Conduit elbows (8200 series) could be used with flying leads and terminal blocks versions, excepted for MIL-connector (not compatible).
- Update of technical drawings and documents implementing RoHS compliance required.

Annex:

IECEx LCI 10.0035X - Issue 04 - Annex 01_1.pdf

Annex 01 to Certificate
IECEx LCI 10.0035X issue 04

FULL EQUIPMENT DESCRIPTION

The vibration transmitter is used to detect vibration level of machine. It provides at the output a current, in the range 4-20 mA, function of the vibration level.

The sensor electronic boards are installed in a stainless steel enclosure which can be optionally monted on a 8200 series Killark metallic enclosure.

The entire sensor unit is encapsulated.

The equipment must be installed per drawing 9278.

The equipment provides different connection types: 2 or 4-wire flying leads, 2 or 4-pin terminal block, 2-pin MIL terminal.

Title	Reference	Rev. Level	Date
Technical File	1891766	A	2020/02/04
Installation manual	M9162	--	--

MARKING

METRIX INSTRUMENT Co.
Address: …
Type: ST5484E-AAA-BBCD-EF (1)
Serial number: …
Year of construction: …
Ex ia IIC T4 Ga
-40°C ≤ T_{amb} ≤ +100°C
IECEx LCI 10.0035X
U_i : 29.6 V, I_i : 100 mA, P_i : 0.75 W, C_i : 70 nF, L_i : 0.6 µH
(1) Completed with the model.

RANGE DETAILS

ST5484E-AAA-BBCD-EF, with AAA, BBCD and EF variable digits defined as:

AAA (3 digits) : range

Model ST5484E-		A1	A2
Peak	RMS		
121	151	1.0 IPS	25.4 mm/s
122	152	0.5 IPS	12.7 mm/s
123	153	2.0 IPS	50.8 mm/s
124	154	5.0 IPS	125 mm/s
126	156	0.8 IPS	20.3 mm/s
132	162	3.0 IPS	76.2 mm/s

BB (2 digits) : housing material and stud size

00-09, 20	303 SST housing, multiple stud sizes
10-19, 30	316 SST housing, multiple stud sizes

C (1 digit) : hazardous area certification

3	ATEX, Ex ia IIC T4 Ga
7	ATEX/**IECEx**, Ex ia IIC T4 Ga
B	ATEX/EAC, Ex ia IIC T4 Ga

D : Connection type

0	24” Flying Leads, 2-wire (4-20 mA output only)
1	24” Flying Leads, 4-wire (4-20 mA output and dynamic raw acceleration signal)
2	Terminal Block, 2-wire (4-20 mA output only)
3	Terminal Block, 4-wire (4-20 mA output and dynamic raw acceleration signal)
4	2-Pin MIL-style (4-20 mA output only)
5	72” Flying Leads, 2-wire (4-20 mA output only)
6	72” Flying Leads, 4-wire (4-20 mA output and dynamic raw acceleration signal)

E : high pass (-3db)

0	2 Hz
1	5 Hz
2	10 Hz
3	20 Hz
4	50 Hz
5	100 Hz
6	200 Hz
X	CUSTOM

F : low pass (-3db)

0	1500 Hz
1	500 Hz
2	1000 Hz
3	2000 Hz
4	250 Hz
5	230 Hz
X	CUSTOM

RATINGS

Intrinsic safety electrical parameters **:** U_i : 29.6 V, I_i : 100 mA, P_i : 0.75 W, C_i : 70 nF, L_i : 0.6 µH

ROUTINE TESTS

None.

APPARATUS OVERVIEW

Flying Leads
(Option D=0, 1, 5, or 6) (2-wire shown; 4-wire also available)

4-Pin Terminal Block
(Option D=3)

2-Pin Terminal Block
(Option D=2)

2-Pin MIL Connector
(Option D=4)

ADDITIONAL MANUFACTURING LOCATIONS

None.

TEST & ASSESSMENT REPORTS

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR10.0037/00
FR/LCI/ExTR10.0037/01
FR/LCI/ExTR10.0037/02
FR/LCI/ExTR10.0037/03
FR/LCIE/ExTR18.0031/00

Quality Assessment Report:

GB/BAS/QAR10.0017/06

The following pages are the prior revisions of this certificate.

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx LCI 10.0035X issue No.:3	Certificate history: Issue No. 3 (2013-11-29) Issue No. 2 (2011-11-17) Issue No. 1 (2011-4-11) Issue No. 0 (2010-10-19)
Status:	**Current**	
Date of Issue:	**2013-11-29**	Page 1 of 4
Applicant:	**Metrix Instrument Co.** 8824 Fallbrook Drive Houston, Texas 77064 **United States of America**	
Electrical Apparatus: *Optional accessory:*	**Vibration transmitter type ST5484E-...**	
Type of Protection:	**ia**	
Marking:	METRIX INSTRUMENT Co. Address :... Type : ST5484E-... (1) Serial number : .... Year of construction : .... Ex ia IIC T4 Ga IECEx LCI 10. 0035 X -40℃ ≤ Tamb ≤ +100℃ Ui ≤ 29.6 V, Ii ≤ 100 mA, Pi ≤ 0,75 W, Ci ≤ 70 nF, Li ≤ 0.60 µH (1)see attachment	

Approved for issue on behalf of the IECEx Certification Body: Julien Gauthier

Position: Certification officer

Signature:
(for printed version)

Date: 2013-11-29

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

Documents relative to LCIE certification activites (Certificates, QARs, ExTRs) can be registered under the references "LCI" or "LCIE".

L C I E

METRIX DOC NO: 1185352
REV: B

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2013-11-29** Issue No.: **3**

Manufacturer: **Metrix Instrument Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
FR/LCI/ExTR10.0037/00 FR/LCI/ExTR10.0037/01 FR/LCI/ExTR10.0037/02
FR/LCI/ExTR10.0037/03

Quality Assessment Report:

GB/BAS/QAR10.0017/00 GB/BAS/QAR10.0017/01 GB/BAS/QAR10.0017/02

METRIX DOC NO: 1185352
REV: B

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2013-11-29** Issue No.: **3**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The vibration transmitter is used in detecting machine vibration and providing an indication of increased vibration levels by increasing current consumed by the device. It must be installed per drawing 9278.There is no free internal volume as the entire unit is encapsulated.

CONDITIONS OF CERTIFICATION: YES as shown below:

This transmitter must only be associated to IS certified apparatus, and this combination must be compatible as regards intrinsic safety.
The electrical parameters of certified equipment can be connected to the transmitter must not exceed any of these following values :
Uo ≤ 29.6V, Io ≤ 100mA, Po ≤ 0.75W.

METRIX DOC NO: 1185352
REV: B

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2013-11-29** Issue No.: **3**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 : update of documents.
Issue 2 : change of two EMI filters on input ports, addition of a new casting compound as an alternative to those previously used.
Issue 3 :
Normative update according to IEC 60079-0 Ed 6.0 and IEC 60079-11 Ed 6 standards.
Clarification of the model reference : ST5484E-XXX-Y3Z-WW or ST5484E-XXX-Y5Z-WW or ST5484E-XXX-Y7Z-WW mounted with optional conduit elbow 8200-001.

Annex: LCIE 10.0035X-attachment 1.pdf

METRIX DOC NO: 1185352
REV: B

IECEx LCI 10.0035 X issue 3
Attachment n°01

Designation of the model : ST5484-aaa-bcd-ef :

aaa : range

Model ST5484E-		A1	A2
Peak	RMS		
121	151	1,0 IPS	25,4 mm/s
122	152	0,5 IPS	12,7 mm/s
123	153	2,0 IPS	50,8 mm/s
124	154	5,0 IPS	125 mm/s
126	156	0,8 IPS	20,3 mm/s
132	162	3,0 IPS	76,2 mm/s

b : housing material and stud size

0-9, 20	303 SST housing, multiple stud sizes
10-19, 30	316 SST housing, multiple stud sizes

c : hazardous area certification

3	ATEX, Ex ia IIC T4 Ga
5	INMETRO, Ex ia IIC T4 Ga
6	INMETRO, Ex d IIC T4 Gb
7	IECEx, Ex ia IIC TA Ga
8	ATEX/IECEx, Ex d IIC T4 Gb

d : dynamic output

0, 2, 4, 5	4-20mA output only
1, 3, 6	Dynamic output = 100mV/g

e : high pass (-3db)

0	2 Hz
1	5 Hz
2	10 Hz
3	20 Hz
4	50 Hz
5	100 Hz
6	200 Hz
X	CUSTOM

f : low pass (-3db)

0	1500 Hz
1	500 Hz
2	1000 Hz
3	2000 Hz
4	250 Hz
5	230 Hz
X	CUSTOM

The following pages are the prior revisions of this certificate.

8824 Fallbrook Dr. ● Houston, TX 77064 USA ● Tel: (1) 281-940-1802 ● Fax: (1) 713-559-9417 ● info@metrixvibration.com ●
www.metrixvibration.com ISO 9001:2000 Certified

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx LCI 10.0035X issue No.:2	Certificate history: Issue No. 2 (2011-11-17) Issue No. 1 (2011-4-11) Issue No. 0 (2010-10-19)
Status:	**Current**	
Date of Issue:	**2011-11-17**	Page 1 of 4

Applicant: **METRIX INSTRUMENT Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Electrical Apparatus: **Vibration transmitter**
Optional accessory:

Type of Protection: **ia**

Marking: **METRIX INSTRUMENT Co.**
Address :...
Type : ST5484E
Serial number : ....
Year of construction : ....
Ex ia IIC T4
IECEx LCI 10. 0035 X
-40°C ≤ Tamb ≤ +100°C
Ui ≤ 29.6 V, Ii ≤ 100 mA, Pi ≤ 0,75 W,
Ci ≤ 70 nF, Li ≤ 0.60 µH

Approved for issue on behalf of the IECEx Certification Body: Michel Brenon

Position: Certification officer

Signature:
(for printed version)

Date: November 28, 2011

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

L C I E

METRIX DOC NO: 1185352
REV: A

IE-01

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2011-11-17** Issue No.: **2**

Manufacturer: **METRIX INSTRUMENT Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
FR/LCI/ExTR10.0037/02

Quality Assessment Report:

GB/BAS/QAR10.0017/00

METRIX DOC NO: 1185352
REV: A

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2011-11-17** Issue No.: **2**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The vibration transmitter is used in detecting machine vibration and providing an indication of increased vibration levels by increasing current consumed by the device. It must be installed per drawing 9278.There is no free internal volume as the entire unit is encapsulated.

CONDITIONS OF CERTIFICATION: YES as shown below:

This transmitter must only be associated to IS certified apparatus, and this combination must be compatible as regards intrinsic safety.
The electrical parameters of certified equipment can be connected to the transmitter must not exceed any of these following values :
Uo ≤ 29.6V, Io ≤ 100mA, Po ≤ 0.75W.

METRIX DOC NO: 1185352
REV: A

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2011-11-17** Issue No.: **2**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1: update of the technical file.
Issue 2:
- Change of two EMI filters on input ports.
- Addition of a new casting compound as an alternative to those previously used.

METRIX DOC NO: 1185352
REV: A

The following pages are the prior revisions of this certificate.

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx LCI 10.0035X issue No.:1	Certificate history: Issue No. 1 (2011-4-11) Issue No. 0 (2010-10-19)
Status:	**Current**	
Date of Issue:	**2011-04-11**	Page 1 of 4

Applicant: **METRIX INSTRUMENT Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Electrical Apparatus: **Vibration transmitter**
Optional accessory:

Type of Protection: **ia**

Marking: **METRIX INSTRUMENT Co.**
Address :...
Type : ST5484E
Serial number : ....
Year of construction : ....
Ex ia IIC T4
IECEx LCI 10. 0035 X.....
-40°C ≤ Tamb ≤ +100°C
Ui ≤ 30V, Ii ≤= 100mA, Pi ≤ 0,75W,
Ci ≤29nF, Li ≈ 0

Approved for issue on behalf of the IECEx Certification Body: Marc Gillaux

Position: Ex certification manager

Signature:
(for printed version)

Date: 11 AVR. 2011

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

L C I E

METRIX DOC NO: 1185352
REV: A

IE-01

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2011-04-11** Issue No.: **1**

Manufacturer: **METRIX INSTRUMENT Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR10.0037/01

Quality Assessment Report:

GB/BAS/QAR10.0017/00

METRIX DOC NO: 1185352
REV: A

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2011-04-11** Issue No.: **1**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The vibration transmitter is used in detecting machine vibration and providing an indication of increased vibration levels by increasing current consumed by the device. It must be installed per drawing 9278.There is no free internal volume as the entire unit is encapsulated.

CONDITIONS OF CERTIFICATION: YES as shown below:

This transmitter must only be associated to IS certified apparatus, and this combination must be compatible as regards intrinsic safety.
The electrical parameters of certified equipment can be connected to the transmitter must not exceed any of these following values :
Uo ≤ 30V, Io ≤= 100mA, Po ≤ 0,75W

METRIX DOC NO: 1185352
REV: A

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2011-04-11** Issue No.: **1**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- Update of documents

METRIX DOC NO: 1185352
REV: A

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx LCI 10.0035X issue No.:0	Certificate history:
Status:	**Current**	
Date of Issue:	**2010-10-19**	Page 1 of 3

Applicant: **METRIX INSTRUMENT Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Electrical Apparatus: **Vibration transmitter**
Optional accessory:

Type of Protection: **ia**

Marking: **METRIX INSTRUMENT Co.**
Address :...
Type : ST5484E
Serial number : ....
Year of construction : ....
Ex ia IIC T4
IECEx LCI 10. 0035 X.....
-40°C ≤ Tamb ≤ +100°C
Ui ≤ 30V, Ii ≤= 100mA, Pi ≤ 0,75W,
Ci ≤29nF, Li ≈ 0

Approved for issue on behalf of the IECEx Certification Body: Marc Gillaux

Position: Ex certification manager

Signature:
(for printed version)

Date: 19/10/10

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

L C I E

METRIX DOC NO: 1185352
REV: A

IE-01

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2010-10-19** Issue No.: **0**

Manufacturer: **METRIX INSTRUMENT Co.**
8824 Fallbrook Drive
Houston, Texas 77064
United States of America

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/LCI/ExTR10.0037/00

Quality Assessment Report:
GB/BAS/QAR10.0017/00

METRIX DOC NO: 1185352
REV: A

IECEx Certificate of Conformity

Certificate No.: IECEx LCI 10.0035X

Date of Issue: **2010-10-19** Issue No.: **0**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The vibration transmitter is used in detecting machine vibration and providing an indication of increased vibration levels by increasing current consumed by the device. It must be installed per drawing 9278.There is no free internal volume as the entire unit is encapsulated.

CONDITIONS OF CERTIFICATION: YES as shown below:

This transmitter must only be associated to IS certified apparatus, and this combination must be compatible as regards intrinsic safety.
The elctrical parameters of certified equipment can be connected to the transmitter must not exceed any of thse following values :
Uo ≤ 30V, Io ≤= 100mA, Po ≤ 0,75W

METRIX DOC NO: 1185352
REV: A

IE-01

IECEx Technical Report: FR/LCI/ExTR10.0037/00 details

ExTR :	
ExTR Reference Number *: (automatic numbering)	FR/LCI/ExTR10.0037/00
Status*:	Issued
ExTR Free Reference Number*:	101708-602234
Date of Issue*: (yyyy-mm-dd)	2010-10-19
List of Standards Covered*:	IEC 60079-0 (Ed.4.0); IEC 60079-11 (Ed.5)
Issuing ExTL*:	LCI - Laboratoire Central des Industries Electriques (LCIE)
Endorsing ExCB*:	LCI - Laboratoire Central des Industries Electriques (LCIE)
Manufacturer*:	METRIX INSTRUMENT Co. 8824 Fallbrook Drive Houston, Texas 77064
Country of Manufacture*:	United States of America
Ex Protection*:	ia
Ratings:	Ui ≤ 30V, Ii ≤ 100mA, Pi ≤ 0,75W, Ci ≤ 29nF, Li ≈ 0
Product*:	Vibration transmitter
Model Reference*:	ST5484E
Related IECEx Certificates:	IECEx LCI 10.0035X issue: 0 [Current]
Comment:	
Attachment:	

Last modified: 22/10/2010 08:24:24

METRIX DOC NO: 1185352
REV: A