

FUNCTIONAL SAFETY CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

Seismic Velocity Transmitter ST5484E
Vibration Transmitter ST5491E (All configurations)

Manufactured by:

Metrix Instruments Co., L.P.
18824 Fallbrook Drive
Houston, TX 77064
United States of America

Metrix Instruments Co., L.P.
No. 7 Building, no. 568 Longpan road,
Malu town, Jiading district, Shanghai
China

suitable for the following safety function(s):

To provide a 4-20mA DC signal output proportional to the vibration amplitude of rotating equipment portion where installed

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 2

and meets the requirements providing the following:

Systematic Capability:

The compliance with the requirements for the avoidance of systematic faults and the requirements for the control of systematic faults have been achieved following the compliance Route 1_S.

SC 2

Hardware Safety Integrity:

The constraints on hardware safety integrity have been verified in order to achieve a sufficiently robust architecture taking into account the level of element and subsystem complexity following the compliance Routes 1_H and 2_H.

Type
A

Random Safety Integrity:

The estimated safety integrity, for each safety function, due to random hardware safe and dangerous failures rates (excluding "no part" and "no effect" contribution).

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page
2

The architectural constraints and the effects of random failures (PFH/PFD_{AVG}) must be verified for each specific application and safety function implemented by the E/E/PE safety-related system.

Certified by:

BYHON

BYHON Certification Director:

Rosati Francesco

CERTIFICATE No:

MTXI-5484E-ENS-B02

Issued:

April 29th, 2026

Valid until:

May 22nd, 2028

The owner of a valid certificate for an assessed product is authorized to affix the following mark to all recognized devices which are identical to the product assessed.

BYHON
SIL ✓



ANSI National Accreditation Board

ACCREDITED

ISO/IEC 17065

**PRODUCT CERTIFICATION
BODY**

#8914

*The Certificate shall be reproduced only in its original entirety

The design of each Safety Instrumented Function (SIF) shall meet the requirements listed in the reference standards that shall be selected by taking into account the specific application. Specific activities necessary to investigate and reach a judgment on the adequacy of the functional safety achieved by the E/E/PE safety-related system or compliant items (elements/subsystems) has been conducted by an independent assessor.

The following failure rates data shall be used to the PFH/PFD_{AVG} estimation, taking into consideration all parameters such as redundancy, architectural constraints, diagnostic capability, also introduced by the whole system, including the considerations about the proof test and its effectiveness, mean time of restoration, up to the maintenance capability and its minimum characteristics.

Failure rate for ST5484E and ST5491E - All configurations

Product	Series	λ_s	λ_{DU}	λ_{DD}
Seismic Velocity Transmitter	ST5484E	94	117	114
Vibration Transmitter	ST5491E			

Note:

- All failure rates are in FIT (Failure In Time 1 FIT = 1 failure / 10⁹ hours).
- The prescriptions contained in the safety manual QP064-42 shall be followed.
- The device can be used in SIL 2 application with HFT=0. In any case, the SIL reached by the entire Safety Instrumented Function (SIF) must be verified by the System Integrator / Final User considering demand mode, architectures, proof test interval and effectiveness, availability of diagnostics.

CERTIFICATE NO:
MTXI-5484E-ENS-B02

Issued:
April 29th, 2026

Valid until:
May 22nd, 2028

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25-MTX-5484E-FSA-02

dated:
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certificate



Mod_12_CB Rev09

BYHON
Via Lepanto 23, 59100
Prato (PO)
ITALY

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The following pages are the prior revisions of this certificate.

FUNCTIONAL SAFETY CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

Seismic Velocity Transmitter ST5484E
Vibration Transmitter ST5491E (All configurations)

Manufactured by:

Metrix Instruments Co.
18824 Fallbrook Dr. Houston, TX 77064
United States of America

suitable for the following safety function(s):

To provide a 4-20mA DC signal output proportional to the vibration amplitude of rotating equipment portion where installed

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 2

and meets the requirements providing the following:

Systematic Capability:

The compliance with the requirements for the avoidance of systematic faults and the requirements for the control of systematic faults have been achieved following the compliance Route 1_S.

SC 2

Hardware Safety Integrity:

The constraints on hardware safety integrity have been verified in order to achieve a sufficiently robust architecture taking into account the level of element and subsystem complexity following the compliance Routes 1_H and 2_H.

Type
A

Random Safety Integrity:

The estimated safety integrity, for each safety function, due to random hardware safe and dangerous failures rates (excluding "no part" and "no effect" contribution).

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page
2

The architectural constraints and the effects of random failures (PFH/PFD_{AVG}) must be verified for each specific application and safety function implemented by the E/E/PE safety-related system.

Certified by:

BYHON

BYHON Certification Director:

Rosati Francesco

Rosati Francesco

CERTIFICATE No:

MTXI-5484E-ENS-B01

Issued:

May 23rd, 2025

Valid until:

May 22nd, 2028

The owner of a valid certificate for an assessed product is authorized to affix the following mark to all recognized devices which are identical to the product assessed.

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SIL ✓



ANSI National Accreditation Board

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ISO/IEC 17065

**PRODUCT CERTIFICATION
BODY**

#8914

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The design of each Safety Instrumented Function (SIF) shall meet the requirements listed in the reference standards that shall be selected by taking into account the specific application. Specific activities necessary to investigate and reach a judgment on the adequacy of the functional safety achieved by the E/E/PE safety-related system or compliant items (elements/subsystems) has been conducted by an independent assessor.

The following failure rates data shall be used to the PFH/PFD_{AVG} estimation, taking into consideration all parameters such as redundancy, architectural constraints, diagnostic capability, also introduced by the whole system, including the considerations about the proof test and its effectiveness, mean time of restoration, up to the maintenance capability and its minimum characteristics.

Failure rate for ST5484E and ST5491E - All configurations

Product	Series	λ_s	λ_{DU}	λ_{DD}
Seismic Velocity Transmitter	ST5484E	94	117	114
Vibration Transmitter	ST5491E			

Note:

- All failure rates are in FIT (Failure In Time 1 FIT = 1 failure / 10⁹ hours).
- The prescriptions contained in the safety manual QP064-42 shall be followed.
- The device can be used in SIL 2 application with HFT=0. In any case, the SIL reached by the entire Safety Instrumented Function (SIF) must be verified by the System Integrator / Final User considering demand mode, architectures, proof test interval and effectiveness, availability of diagnostics.

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MTXI-5484E-ENS-B01

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Mod_12_CB Rev09

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FUNCTIONAL SAFETY CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

*Seismic Transmitters ST5484E and ST5491E
(all configurations)*

Manufactured by:

*Metrix Instruments Co.
8824 Fallbrook Dr. Houston, TX 77064
United States of America*

suitable for the following safety function(s):

- . Provides a 4-20mA DC signal output proportional to the vibration amplitude of rotating equipment portion where installed.

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 7

and meets the requirements providing the following:

Systematic Capability:

The compliance with the requirements for the avoidance of systematic faults and the requirements for the control of systematic faults have been achieved following the compliance route 1_S.

SC 2

Hardware Safety Integrity:

The constraints on hardware safety integrity have been verified in order to achieve a sufficiently robust architecture taking into account the level of element and subsystem complexity following the compliance route 1_H.

Type
A

Random Safety Integrity:

The estimated safety integrity, for each safety function, due to random hardware safe and dangerous failures rates (excluding "no part" and "no effect" contribution).

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page
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The architectural constraints and the effects of random failures (PFH/PFD_{AVG}) must be verified for each specific application and safety function implemented by the E/E/PE safety-related system.

Certified by:

BYHON

BYHON Certification Director:


Rosati Francesco

CERTIFICATE No:

MTXI-5484E-ENS-E01

Revision: A

Issued:

February 16th, 2022

Valid until:

February 15th, 2025

The owner of a valid certificate for an assessed product is authorized to affix the following mark and relative ID number, to all recognized devices which are identical to the product assessed.

BYHON
SIL ✓

ID.N° 010522E03N



#8914
ISO/IEC 17065
Product Certification Body

The design of each Safety Instrumented Function (SIF) shall meet the requirements listed in the reference standards that shall be selected by taking into account the specific application. Specific activities necessary to investigate and reach a judgment on the adequacy of the functional safety achieved by the E/E/PE safety-related system or compliant items (elements/subsystems) has been conducted by an independent assessor.

The following failure rates data shall be used to the PFH/PFD_{AVG} estimation, taking into consideration all parameters such as redundancy, architectural constraints, diagnostic capability, also introduced by the whole system, including the considerations about the proof test and its effectiveness, mean time of restoration, up to the maintenance capability and its minimum characteristics.

Failure rate for Seismic Transmitters ST5484E and ST5491E– All configurations

λ_{SU}	λ_{SD}	λ_{DU}	λ_{DD}	λ_{RES}
94	0	117	114	640

Note:

- The λ_{RES} (RESIDUAL) failure rates includes the NO PART and NO EFFECT failure rates.
- All failure rates are in FIT (Failure In Time 1 FIT = 1 failure / 10⁹ hours).

The prescriptions contained in the safety manual QP064-42 shall be followed.

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Revision: A

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Mod_12_CB Rev03

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Via Lepanto 23, 59100
Prato (PO)
ITALY



The following pages are the prior revisions of this certificate.

CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

**Seismic Transmitters STS484E and STS491E
(all configurations)**

Manufactured by:

Metrix Instruments Co.
8824 Fallbrook Dr. Houston, TX 77064
United States of America

suitable for the following safety function(s):

Provides a 4-20mA DC signal output proportional to the vibration amplitude of rotating equipment portion where installed.

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 7

and meets the requirements providing the following:

Systematic Capability:

The compliance with the requirements for the avoidance of systematic faults and the requirements for the control of systematic faults have been achieved following the compliance route 1:

SC 2

Hardware Safety Integrity:

The constraints on hardware safety integrity have been verified in order to achieve a sufficiently robust architecture taking into account the level of element and subsystem complexity following the compliance route 1:

Type
A

Random Safety Integrity:

The estimated safety integrity, for each safety function, due to random hardware safe and dangerous failures rates (excluding "no part" and "no effect" contribution),

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The architectural constraints and the effects of random failures (PRH/PPD_{AVL}) must be verified for each specific application and safety function implemented by the E/E/PE safety-related system.

Certified by:

BYHON

BYHON Certification Director:



Rosati Francesco

CERTIFICATE No:

MTXI-5484E-ENS-E01

Revision: A

Issued:

July 31st, 2019

Valid until:

July 30th, 2022

The owner of a valid certificate for an assessed product is authorized to affix the following mark and relative ID number, to all recognized devices which are identical to the product assessed.

BYHON
SIL ✓

ID.N° 500719E01N

The design of each Safety Instrumented Function (SIF) shall meet the requirements listed in the reference standards that shall be selected by taking into account the specific application. Specific activities necessary to investigate and reach a judgment on the adequacy of the functional safety achieved by the E/E/PE safety-related system or compliant items (elements/subsystems) has been conducted by an independent assessor.

The following failure rates data shall be used to the PFH/PFD_{RMS} estimation, taking into consideration all parameters such as redundancy, architectural constraints, diagnostic capability, also introduced by the whole system, including the considerations about the proof test and its effectiveness, mean time of restoration, up to the maintenance capability and its minimum characteristics.

Failure rate for Seismic Transmitters STS484E and STS491E– All configurations

λ_{SU}	λ_{SD}	λ_{OU}	λ_{OD}	λ_{RES}
94	0	117	114	640

- Note:
- All failure rates are in FIT (Failure In Time 1 FIT = 1 failure / 10⁹ hours).
 - The λ_{RES} (RESIDUAL) failure rates includes the NO PART and NO EFFECT failure rates.

The prescriptions contained in the safety manual QP064-42 shall be followed.

CERTIFICATE NO:
MTXI-5484E-ENS-E01

Revision: A

Issued:
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Valid until:
July 30th, 2022

The Functional Safety
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July 29th, 2019

is an integral part of this
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