FUNCTIONAL SAFETY
CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

*Digital Proximity System MX2033 and MX2034
(all configurations)*

Manufactured by:

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

suitable for the following safety function(s):

Programmable multiple measurement of safety parameters to rotating machinery.

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 3

and meets the requirements providing the following:

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.

Systematic Capability:

SC 2

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.

Hardware Safety Integrity:

Type B

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.

Random Safety Integrity:

See page 2

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

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.

BYHON SIL ✓
ID.N° 010523ES01A

Certified by:

BYHON

BYHON Certification Director:

Rosati Francesco

ANSI ACCREDITED
#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 MX2033

Configuration	λ_{SU}	λ_{SD}	λ_{DU}	λ_{DD}	λ_{RES}
ALL CONFIGURATION	0	0	595	1210	452

Failure rate for MX2034

Configuration	λ_{SU}	λ_{SD}	λ_{DU}	λ_{DD}	λ_{RES}
ALL CONFIGURATION	0	0	644	1349	455

Notes:
1. The firmware releases covered by the present certificate are:
   o 1353.10.XX for the MX2033
   o 1354.20.XX for the MX2034
2. The prescriptions contained in the safety manual QP064-42 shall be followed.
3. The devices can be used in SIL 1 applications with HFT=0, and SIL 2 applications with HFT=1.

The following pages are the prior revisions of this certificate.

FUNCTIONAL SAFETY
CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

*Digital Proximity System MX2033 and MX2034
(all configurations)*

Manufactured by:

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

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.

suitable for the following safety function(s):

Programmable multiple measurement of safety parameters to rotating machinery.

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 7

and meets the requirements providing the following:

MX2033

BYHON SIL ✓
ID.N° 500719E05S

Systematic Capability: SC 2

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.

MX2034

BYHON SIL ✓
ID.N° 010519ES05B

Hardware Safety Integrity: Type B

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.

Random Safety Integrity: See page 2

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

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 Certification Director:

BYHON

Rosati Francesco

ANSI ACCREDITED
#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 MX2033

Configuration	λ_{SU}	λ_{SD}	λ_{DU}	λ_{DD}	λ_{RES}
ALL CONFIGURATION	0	0	595	1210	452

Failure rate for MX2034

Configuration	λ_{SU}	λ_{SD}	λ_{DU}	λ_{DD}	λ_{RES}
ALL CONFIGURATION	0	0	644	1349	455

Note:
The firmware release covered by the present certificate are:

- 1353.10.XX for the MX2033
- 1354.20.XX for the MX2034

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

DOCUMENT NO: 1890844
REV: B

The following pages are the prior revisions of this certificate.

CERTIFICATE

CERTIFICATO – ZERTIFIKAT – CERTIFICADO – CERTIFICAT

The product:

**Digital Proximity System MX2033 and MX2034
(all configurations)**

Manufactured by:

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

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.

suitable for the following safety function(s):

Programmable multiple measurement of safety parameters to rotating machinery.

has been assessed per the relevant requirements of

IEC 61508:2010 Parts 1 to 7

and meets the requirements providing the following:

MX2033

BYHON SIL ✓
ID.N° 500719E05S

Safety Aspect	Result
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 1ₛ.	SC 2
Software Systematic Capability: The MX2033 and MX2034 dedicated firmware have been designed, developed and validated at compliance with the requirements for the avoidance of software systematic faults following the compliance route 1ₛ.	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 1ₕ.	Type B
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).	See page 2

MX2034

BYHON SIL ✓
ID.N° 500719E04S

Certified by:
BYHON

BYHON Certification Director:
Rosati Francesco

ANSI ACCREDITED
#8914
ISO/IEC 17065
Product Certification Body

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.

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.

Where applicable, the compliance with all requirements established by specific sector standards, such as IEC 61511 or IEC 62061, shall be evaluated considering the constraints each specific application.

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 MX2033

Configuration	λ_{SU}	λ_{SD}	λ_{DU}	λ_{DD}	λ_{RES}
ALL CONFIGURATION	0	0	595	1210	452

Failure rate for MX2034

Configuration	λ_{SU}	λ_{SD}	λ_{DU}	λ_{DD}	λ_{RES}
ALL CONFIGURATION	0	0	644	1349	455

Note:
The firmware release covered by the present certificate are:

- 1353.10.XX for the MX2033
- 1354.10.XX for the MX2034

The prescriptions contained in the safety manual QP069-41 shall be followed.