



IECE_x TEST REPORT



APPLICANT: Nidec Industrial Solutions

ExTR REFERENCE NUMBER: US/UL/ExTR17.0051/02

ExTR FREE REFERENCE NUMBER: 4788428714.4.1

PRODUCT: Encoder and Parts Kit

Ex TESTING LABORATORY (ExTL): UL LLC
333 Pfingsten Road
Northbrook, IL 60062
USA





IECEX TEST REPORT COVER

ExTR Reference Number.....: US/UL/ExTR17.0051/02

ExTR Free Reference Number: 4788428714.4.1

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Date of issue: 2019-07-25

Ex Testing Laboratory (ExTL).....: UL LLC

Address: 333 Pfingsten Road, Northbrook, IL 60062 USA

Ex Certification Body (ExCB).....: UL LLC

Address: 333 Pfingsten Road, Northbrook, IL 60062 USA

Applicant's name.....: Nidec Industrial Solutions

Address: 8901 E. Pleasant Valley Road, Independence, OH 44131 USA

Standards associated with this ExTR package: IEC 60079-0, 6th Edition (2011-06) + Corr. 1 (2012-01) + Corr. 2 (2013-12) + I-SH 01 (2013-11) + I-SH 02 (2014-10),

IEC 60079-1, 7th Edition (2014-06),

IEC 60079-11, 6th Edition (2011-06) + Corr. 1 (2012-01) + I-SH 01 (2014-10) + I-SH 02 (2016-07) + I-SH 03 (2016-07)


Clauses considered: All clauses considered



Test Report Form Number	ExTR Cover_7 (released 2018-02)
Related Amendments, Corrigenda or ISHs	See above

Test item description	Encoder and Parts Kit
Model/type reference	Series XP5 and XPH Modular Encoders
Code (e.g. Ex _ II_ T_)	Ex db ia IIB T4 Gb
Rating	24V, 500mA, Um = 250V

ExTR Package Contents	
Assembled ExTR documents and Additional reference material:	
IECEX Test Report Cover	
IECEX Test Report Addendum: IEC 60079-0, Edition 6, IEC 60079-1, Edition 7, IEC 60079-11, Edition 6	

Manufacturer's name	Nidec Industrial Solutions
Address	8901 E. Pleasant Valley Road, Independence, OH 44131 USA
Manufacturer's name	Nidec Industrial Solutions
Address	7555 E. Pleasant Valley Road, Building 100, Independence, OH 44131 USA
Trademark	
Certificate No. (optional)	IECEX UL 17.0049X Issue 2, DEMKO 17 ATEX 1880X Rev. 2
QAR Reference No. (optional)	US/UL/QAR12.0002/05
Particulars: Test item vs. Test requirements	
Classification of installation and use	Stationary
Ingress protection	N/A
Rated ambient temperature range (°C)	-50 °C ≤ Tamb ≤ +85 °C

**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.

This ExTR Package was created using the ATEX/IECEX Document Generator Rev. 23.

General product information:

The XP5 is a series of magnetic flameproof and intrinsically safe encoders designed for rotational sensing. The equipment is comprised of two compartments, and flameproof enclosure housing the galvanic isolator (associated apparatus) and drive electronics, and a second compartment containing the intrinsically safe sensor circuitry. The flameproof enclosure of the XP5 is comprised of the housing and cover, secured together by four metal M5 cover screws. Encapsulation is provided within the flameproof enclosure, and completely fills the intrinsically safe compartment.

The XPH is an assembly of components including the series XP5 sensor, rotor, adapter bracket/housing, adapter housing cover, and sensor cover.

Nomenclature :

I	II	III	IV	V	VI
XP5	2	6	AY	A	000

I – Model DesignationCodeDescription

-

XP5

II - Style

* -

Rotor Size and Adapter Configuration

III - Line Driver

2 -

5 to 24V in / OC out

6 -

5 to 24V in / 5 to 24V out

8 -

5 to 24V in / 5 to 24V out high power

IV- PPR Left

** -

Pulse Per Revolution to Drive

V - Connector

** -

M25, ½ NPT, ¾ NPT Connection on the Left, Right, or Both Sidewalls of Housing

VI - Mod Code



*** - Optional Features

I	II	III	IV	V	VI	VII	VIII	IX
XPH	1	TM	F	6	AY	AY	A	000

<u>I – Model Designation</u>	<u>Code</u>	<u>Description</u>
-	XPH	
<u>II - Style</u>	* -	Rotor Size and Adapter Configuration
<u>III – Rotor Type & Size</u>	** -	Rotor Bore Size and Connection to Shaft
<u>IV – Housing Cover Type</u>	* -	XPH Cover Configuration
<u>V – Line Driver</u>	2 -	5 to 24V in / OC out
	6 -	5 to 24V in / 5 to 24V out
	8 -	5 to 24V in / 5 to 24V out high power
<u>VI – PPR Left</u>	** -	Pulse Per Revolution
<u>VII – PPR Right</u>	** -	Pulse Per Revolution
<u>VIII – Connector</u>	** -	M25, 1/2 NPT, 3/4 NPT Connection on the Left, Right, or Both Sidewalls of Housing
<u>IX – Mod Code</u>	*** -	Optional Features

- * - A single number or letter
- ** - Any two-digit combination of numbers and letters
- *** - Any three-digit combination of numbers and letters

Details of change (applicable only when revising an existing ExTR package):

This update includes minor editorial changes to the drawings, the addition of alternate components, and modification of the PCB layouts.



Copy of Marking Plate:

NIDEC INDUSTRIAL SOLUTIONS
INDEPENDENCE, OHIO 44131, USA REV S/N DATE
MFG.

Max. safe area
MODEL OPTIONS PPR V mA voltage $U_m = 250V$

CE 0539 **Ex** II 2G Ex db ia IIB T4 Gb **DEMKO 17 ATEX 1880X** $-50^{\circ}C \leq Tamb \leq 85^{\circ}C$
IECEx UL 17.0049X $-50^{\circ}C \leq Tamb \leq 85^{\circ}C$

Telemetry Equipment for use in Hazardous Locations:
Class I, Division 1, Groups C and D
Ex db ia IIB T4 Gb
Class I Zone 1, AEx db ia IIB T4 Gb
 $-50^{\circ}C \leq Tamb \leq 85^{\circ}C$ T-Code T4
See installation instructions XP5CRT05. Voir les instructions d'installation XP5CRT05.
WARNING/AVERTISSEMENT: A seal shall be installed within 25mm of the enclosure.
+ Un joint doit être installé à moins de 25 mm de l'enveloppe. +
To reduce the risk of ignition of hazardous atmospheres, disconnect the equipment
from the supply circuit before opening enclosure. Keep enclosure tightly closed when in operation.
Pour réduire le risque d'inflammation des atmosphères dangereuses, débranchez l'appareil du circuit
d'alimentation avant d'ouvrir le boîtier. Garder le boîtier hermétiquement fermé en fonctionnement.

UL **US**
LISTED
E364384
WYMV/WYMV7
WYMG/WYMG7

Details regarding 'trade agent' / 'local assembler' application in accordance with OD 203:

N/A

Testing not fully performed by ExTL staff at the above ExTL address:

N/A

National differences considered as part of this evaluation:

This equipment also complies with EN 60079-0:2012+A11:2013, EN 60079-1:2014 and EN 60079-11:2012.

The revision does not affect any national differences between IEC 60079-0, 6th Edition and EN 60079-0:2012+A11:2013; IEC 60079-1, 7th Edition and EN 60079-1:2014 and IEC 60079-11, Ed. 6 and EN 60079-11:2012.

"Specific Conditions of Use":

This product has no user serviceable parts. Care must be taken during use to ensure that flameproof joints on the Cover and Housing are not damaged. Repair of flameproof joints is not permissible. Contact Nidec Industrial Solutions for dimensions of flameproof joints.

The circuits shall be limited to overvoltage category I/II/II as defined in IEC/EN 60664-1.

The (4) screws that secure the XP5 cover onto the XP5 enclosure require the minimum tensile strength shown below:

MATERIAL	GRADE	MINIMUM TENSILE STRENGTH
A2 Stainless Steel	A-70	700 MPa (101.5 KSI)
A4 Stainless Steel	A-80	800 MPa (116.0 KSI)
Carbon Steel	8.8	800 MPa (116.0 KSI)
Alloy Steel	12.9	1220 MPa (176.9 KSI)

Protect the cover seal from sunlight during storage and installation.

**Routine tests:**

N/A

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Technical Documents			
Title:	Drawing No.:	Rev. Level:	Date:
*Certification Drawing Top Level	XP5CRT01	A	2019-06-17
*Certification Drawing Mechanical Requirements	XP5CRT02	B	2019-05-31
Certification Drawing ID Plate	XP5CRT03	A	2018-03-09
Certification Drawing Transformer	XP5CRT04	-	2017-08-28
Certification Drawing User Instructions	XP5CRT05	A	2017-10-10
*Schematic, Sensor Board	XP5CRT11	A	2019-06-14
Layout and BOM, Sensor Board	XP5CRT21	-	2017-09-07
Schematic, Sensor Daughter PCB	XP5CRT12	-	2017-09-29
Layout and BOM, Sensor Daughter PCB	XP5CRT22	-	2017-09-08
Schematic, Interconnect PCB	XP5CRT13	-	2017-09-29
Layout and BOM, Interconnect PCB	XP5CRT23	-	2017-09-12
*Schematic, Galvanic Isolator/Driver PCB	XP5CRT14	A	2019-06-14
*Layout and BOM, Galvanic Isolator/Driver PCB	XP5CRT24	A	2019-06-28
Schematic, Galvanic Isolator AUX PCB	XP5CRT15	-	2017-09-29
*Layout and BOM, Galvanic Isolator AUX PCB	XP5CRT25	A	2019-06-28
Schematic, Terminal Block PCB	XP5CRT17	-	2017-09-29
Layout and BOM, Terminal Block PCB	XP5CRT27	-	2017-09-11

*Note: An * is included before the title of documents that are new or revised.*



IECEX TEST REPORT ADDENDUM

ExTR Reference Number.....:	US/UL/ExTR17.0051/02	
ExTR Free Reference Number	4788428714.4.1	
Compiled by + signature (ExTL).....:	Joshua Acocella	See IECEx Test Report Cover
Compiled by + signature (ExTL).....:	Bryan Huhn	See IECEx Test Report Cover
Compiled by + signature (ExTL).....:	Ben Carver	See IECEx Test Report Cover
Reviewed by + signature (ExTL).....:	Nicholas Voss	See IECEx Test Report Cover
Reviewed by + signature (ExTL).....:	Casey Martin	See IECEx Test Report Cover
Date of issue	See IECEx Test Report Cover	

Ex Testing Laboratory (ExTL)	UL LLC
Address	333 Pfingsten Road, Northbrook, IL 60062 USA

Applicant's name	Nidec Industrial Solutions
Address	8901 E. Pleasant Valley Road, Independence, OH 44131 USA

Standards	IEC 60079-0, 6th Edition IEC 60079-1, 7th Edition IEC 60079-11, 6th Edition
Test Report Form Number	ExTR Addendum_3 (released 2018-02)
Related Amendments, Corrigenda or ISHs	See IECEx Test Report 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.



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Clause	Requirement – Test	Result – Remark	Verdict
IEC 60079-0, 6th Ed.			
5.2	Service Temperature	A temperature test was not considered necessary because the heat producing electrical components have not been modified, and the equipment does not rely upon the O-rings for safety.	Pass
7.1.1	Applicability	Equipment does not rely on a non-metallic part of the flameproof enclosure, with the exception of the Ex Certified line bushing.	Pass
9.2	Special Fasteners	The alternate fastener maintains both an identical metric thread of coarse pitch in accordance with ISO 262 and an identical tolerance fit of 6g/6H in accordance with ISO 965-1 and ISO 965-3. The head of the screw is a Hexagon socket head cap screw in accordance with ISO 4762. The holes in the equipment remain unchanged and comply with Clause No. 9.3	Pass
IEC 60079-1, 7th Ed.			
5.4	Gaskets	O-rings are utilized between the line bushing and the enclosure. The O-rings do not interrupt the flameproof joints.	Pass
IEC 60079-11, 6th Ed.			
5.5	Spark ignition compliance	The maximum ratings of the alternate diodes are identical to those previously certified.	Pass
6.3	Separation distances	The footprint and package size of the alternate diodes are identical to those previously certified. PCB layout changes were implemented in non-critical areas and therefore do not affect the safety of the device.	Pass
7.1	Rating of components	The derating curves of the alternate diodes are identical or less onerous than those previously certified.	Pass



Clause	Requirement – Test	Result – Remark	Verdict
13	Documentation	Documentation was updated to include the alternate diodes and to reflect PCB changes.	Pass

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

N/A