

Nexus OnCore Modules ATEX/IECEX/UL/CAN/UKCA Manual Addendum

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DOCUMENT REVISION HISTORY

Revision	Description of Changes
-	Initial Release
A	Add certification/label details and small module label
B	ECM 500000409147: Update Special Conditions of Use; Add Torque Spec Table
C	ECM 500000415828: Add UKCA mark to labels;
D	ECM 500000418940: Add MVP50-CBBCN

REFERENCE DOCUMENTS

Drawing Number	Title
NCM118586	Nexus Hardware Manual
NCM118617	Nexus OnCore™ Safety System Hardware Manual
153M5823	DOFC CE OnCore Contr Ex Modules w RoHS
153M5824	DOFC CE OnCore Contr Ex Modules no RoHS
153M5825	DOFC CE OnCore Contr SIL Ex Module
153M5827	IECEX Certificate, Nexus OnCore Modules
153M5828	ATEX Certificate, Nexus OnCore Modules
153M5830	UL/CAN Certificate, Nexus OnCore Modules

The following notices will be found throughout this publication. It is important that the significance of each is thoroughly understood by those using this document. The definitions are as follows:

NOTE

Highlights an essential element of a procedure to ensure correctness

CAUTION

Indicates a potentially hazardous situation, which, if not avoided, could result in minor or moderate injury or equipment damage

WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION, WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY

*****DANGER*****

INDICATES AN IMMINENTLY HAZARDOUS SITUATION, WHICH, IF NOT AVOIDED WILL RESULT IN DEATH OR SERIOUS INJURY

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1.0 SCOPE

This Nexus Controls Manuals (NCM) Addendum applies only to Nexus OnCore modules that are certified to ATEX/IECEX/UL/CAN certifications. Refer to the IECEX certificate of the Nexus OnCore modules listed in the reference documents above for all the standards to which the modules have been assessed.

This manual addendum includes only the information necessary to be included in a user's manual for the hazardous area certifications of the modules. For all other information related to the Nexus OnCore modules, please reference the full Nexus OnCore Manuals listed in the Reference Documents section above.

The design of the Nexus Controls modules addresses many potential safety hazards to ensure that the user is not placed in peril by using the device. In the spectrum of potential electrical, environmental, and mechanical hazards, these hazardous area certifications address the dangers posed by explosive atmospheres.

For hazardous area applications, the measures required to ensure safety will be dependent on the nature of the site itself. Rules surrounding installation methods must be adhered to in these applications because the design of the system itself cannot fully ensure safety without correct implementation.

The Nexus OnCore Modules that are certified to ATEX/IECEX/UL/CAN/UKCA are listed below in Table 1.

NOTE

This manual addendum cannot be modified or revised without review and approval by the notified body.

WARNING

NEXUS ONCORE MODULES NOT INSTALLED AND/OR OPERATED PER INSTRUCTIONS FOUND IN THIS MANUAL ADDENDUM MAY RESULT IN DANGEROUS HAZARDOUS CONDITIONS.

Table 1: Certified Nexus OnCore Modules

MODULE PART NUMBER	MODULE DESCRIPTION	VOLTAGE RATING	MAX RATED POWER
MAI50-CBACN	ma/V analog input module 16 channels	21.6-26.4VDC	11W
MAI51-CBACN	TC/RTD analog input module 16 channels	21.6-26.4VDC	1.8W
MAI52-CBACN	mA/V Analog input module 8 channels	21.6-26.4VDC	6.5W

MAI53-CBACN	mA/V Analog input module 16 channels with individual ADC	21.6-26.4VDC	12.7W
MAI54-CBACN	mA/V Analog Input Module 8 Channels with Individual ADC, fast sampling	21.6-26.4VDC	9.2W
MHT50-CBACN	mA/V Analog input module 8 channels with HART	21.6-26.4VDC	6.62W
MHO50-CBACN	mA/V Analog output module 8 channels with HART	21.6-26.4VDC	6.7W
MAO50-CBACN	mA/V analog output module 8 channels	21.6-26.4VDC	6.55W
MDI50-CBACN	Digital input Module 32 channels	21.6-26.4VDC	8.5W
MDI52-CBACN	Digital input module 16 channels	21.6-26.4VDC	5.0W
MDI53-CBACN	Digital input module 16 channels 24VDC	21.6-26.4VDC	3.8W
MDI50A-CBACN	Option board to MDI50 module, 32CHs 24VDC Digital Input	21.6-26.4VDC	24VDC/5mA (each)
MDO53-CBACN	Digital output module 16 AC relay channels	Supply: 21.6-26.4VDC Load: 8A/30VDC	Supply: 11.0W Load: 8A/30VDC
MDO55-CBACN	Digital output 16 channels with source transistor output	21.6-26.4VDC	2.6W Output: 24VDC, 48W
MVP50-CBACN	Valve position control module	21.6-26.4VDC	11.0W
MVP50-CBBCN	Valve position control module (highspeed)	21.6-26.4VDC	11.0W
MVP51-CBACN	Triple redundant LVDT valve position Control Module	21.6-26.4VDC	11.0W
MVP52-CBACN	Valve Position Control Module, dual redundant servo control application	21.6-26.4VDC	11.0W
MVP53-CBACN	TMR Valve Position Control Module	21.6-26.4VDC	6.0W
MSP50-CBACN	Speed Measurement and protection module	21.6-26.4VDC	7.6W
MSP51-CBACN	Speed Measurement and Logic Protection Module (MSP50 hardware, different firmware)	21.6-26.4VDC	7.6W
MLP50-CBACN	TMR programable logic control module	21.6-26.4VDC	6.8W
MCD50-CBACN	iLink & 24VDC Extension Module	21.6-26.4VDC	0.1W
MCD51-CBACN	iLink & 24VDC Extension Module	21.6-26.4VDC	0.1W
MPU55-CBACN	Controller Module	21.6-26.4VDC	7.2W
MPU56-CBACN	Controller Module	21.6-26.4VDC	7.2W
MPU57-CBACN	Controller Module	21.6-26.4VDC	7.2W
BLP50-CBACN	TMR Programmable Logic Protection Base Module	21.6-26.4VDC	9.5W

BVP53-CBACN	TMR Valve Position Control Base Module (for MVP53)	21.6-26.4VDC	0.1W
2oo3-CBACN	2oo3 Relay module	21.6-26.4VDC	1.5W
TCBT-CBACN	Top Train Connection Board	20.4-28.8VDC	<0.1W
TCBB-CBACN	Bottom Train Connection Board	20.4-28.8VDC	<0.1W
SDO60-CBACN	SIL Digital Output Module	20.4-28.8VDC	2W
BSDO60-CBACN	SIL 6CHs Base Board Module	20.4-28.8VDC	12W
SPU60-CBACN	SIL Control Module	20.4-28.8VDC	5W
BSPU60-CBACN	SIL Base Board Module	20.4-28.8VDC	<0.1W
SAI60-CBACN	SIL 8 Channel Analog Input Module	20.4-28.8VDC	5W
BSAI60-CBACN	SIL 8 Channel Analog Input Base Board Module	20.4-28.8VDC	6W
SDI60-CBACN	SIL 24 Channel Digital Input Module	20.4-28.8VDC	5W
BSDI60-CBACN	SIL 24 Channel Digital Input Base Board Module	20.4-28.8VDC	2W

2.0 MODULE INFORMATION

2.1 Ordering Information

The ordering information for the modules following hazardous area modules that are different than the ordering information in the Nexus Hardware Manual, NCM118586, are shown below in Table 2.

Table 2: Ordering Information

Item Code	Module Name	Description
MDO53-CBACN	MDO53	MDO53 DO Module, AC Relay 16CH, CN, IECEx
BLP50-CBACN	BLP50	BLP50, Prog. Logic Prot. Base, CN, IECEx
BSDO60-CBACN	BSDO60	SDO60 6CHs BASE BOARD MODULE, CN, IECEx

For all other module ordering information please refer to the Nexus Hardware Manual, NCM118586.

2.2 Specifications

The following specifications are unique to the IECEx certified Nexus OnCore modules, covered by this manual addendum:

The MDO53-CBACN module has all the same specifications as 369B1844G5004, except the relay parameters. The features of 369B1844G5004 can be found in NCM118586. The relays on the MDO53-CBACN modules that are certified to IECEx have the following specifications:

- Resistive Load Limited to: 8A/30VDC
- Inductive Load Limited to: 4A/30VDC

The BLP50-CBACN module has all the same features as 369B1877G0007, except the relay parameters. The features of 369B1877G0007 can be found in NCM118586. The relays on the BLP50-CBACN modules that are certified to IECEX have the following specifications:

- Resistive Load Limited to: 4A/30VDC
- Inductive Load Limited to: 2.5A/30VDC

The BSDO60-CBACN module has all the same specifications as 369B1844G5010, except the relay parameters. The features of 369B1844G5010 can be found in NCM118617. The relays on the BSDO60-CBACN modules that are certified to IECEX have the following specifications:

- Resistive Load Limited to: 4A/30VDC
- Inductive Load Limited to: 2.5A/30VDC

For all other module specifications please refer to the Nexus OnCore Hardware Manual and Nexus OnCore Safety System Hardware Manual, NCM118586 and NCM118617.

3.0 HAZARDOUS AREA STANDARDS

The Nexus OnCore modules listed in Table 1 above are certified to the following standards:

- IEC/EN 60079-0; CSA STD C22.2# 60079-0; UL STD 60079-0
- IEC/EN/UL/CSA 60079-7; CSA STD C22.2# 60079-7; UL STD 60079-7
- IEC/EN/UL/CSA 60079-15; CSA STD C22.2# 60079-15; UL STD 60079-15

4.0 AREAS OF APPROVED USE

The Nexus OnCore modules listed in Table 1 are certified for use in Class I, Division 2 or Class I, Zone 2 environments. Environments classified as Class I, Division 2 or Class I, Zone 2 restrict the presence of hazardous gasses, liquids, or vapors to occasional unique conditions outside of normal operation. As such, the instrumentation in these environments must be rated against ingress protection to a level of IP54. In the case of the Nexus OnCore modules, this requires use of a weatherproof enclosure with sufficient clearance to provide heat dissipation. Requirements surrounding instrumentation installation in Zone 2 or Div 2 environments are derived from IEC 60079-0 and IEC 60079-15 standards.

The Nexus OnCore Modules are certified for operation in environments within an ambient temperature rating of -20°C to +50°C. The recorded maximum surface temperature of the Nexus

OnCore modules is below the values stated within Table 2 of IEC 60079-0 after the 5K de-rating factor called out for 135°C and 200°C (T4) for all the small components.

Regardless of operating environment, these maximum surface temperatures should be considered by anyone performing maintenance procedures that may require handling system components as the hazard of burns may exist.

5.0 HAZARDOUS AREA INSTALLATION REQUIREMENTS

NOTE

The agencies and authorities charged with enforcement for a region or site category are the final dictators of whether a system is suitable for installation. Changing regulations, or regional variation in regulations may put installation requirements on a system that diverge from the recommendations in this manual.

Installation of a system in a Division 2 or Zone 2, hazardous area environment should adhere to best practices listed below. Additionally, most sites will have specific requirements that address the unique features of the specific application. Site specific requirements will be established at the time that the installation is certified.

- 1) The Nexus OnCore modules have been assessed for use in Group IIC Division 2 or Zone 2 environments. The modules must be installed in a suitable IECEx certified Ex e enclosure and minimum ingress protection IP54 enclosure. The enclosure shall be suitable for an ambient temperature range of -20°C to +50°C and a service temperature of 90°C. It is the responsibility of the end user to maintain the ambient conditions for the equipment. It is also the end users' responsibility to choose the appropriate enclosure.
- 2) Follow the installation wiring diagrams, specific conditions of safe use, and hazardous area certificates, that come with the product when installing in hazardous areas.
- 3) Appropriate relevant authorities must review and approve all hazardous area installations prior to energizing the product. These authorities should also be consulted in the occurrence of significant system upgrades or parts replacement as well.
- 4) Relay contacts may be energized by potentially hazardous voltages even when power to the modules has been disconnected. Take proper precautions to ensure that these voltages do not pose a hazard when maintenance or system upgrades are performed.
- 5) The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.
- 6) When installed in a metal enclosure, the enclosure shall have an external facility for an earth bonding connection, which complies with IEC 60079-0:2011 clause 15.1.2 / EN 60079-0:2012/A11:2013 clause 15.1.2 and which is electrically in contact with the internal earth connection facility on the equipment.
- 7) Cable and cable entry devices shall be suitable for a maximum ambient temperature of 90°C.

- 8) All connectors used with the Nexus OnCore Modules shall meet the requirements shown below
- a) Terminal blocks and DB connection used metallic screws to secure.
 - b) Ethernet cable connectors secured by latch. For all those connectors, there is no risk for loosening of the connection in service.
 - c) Conductors are present within plastic material that protects the conductors.
 - d) Connectors provide positive compression force upon connection.
 - e) Connector body is metallic and plastic material holds conductors in place. Temperature changes are not expected to impair performance.
 - f) Contact pressure does not depend on structural integrity of insulating materials.
 - g) Not this type – connector is prefabricated with conductors.
 - h) Not intended for stranded conductors.
 - i) Torque were specified by manufacturer.
 - j) Not class 5 or class 6 conductors.

6.0 CONNECTOR TORQUE SPECIFICATIONS

The following table shows all the torque specifications for the screw type connectors used on the hazardous area Nexus OnCore modules:

Table 3: Connector Torque Specifications

MODULE PART NUMBER	CONNECTOR PART NUMBER	TORQUE VALUES (N-m)
MAI50-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MAI51-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MAI52-CBACN	369B1690P0327	0.79
	369B1690P0328	
MAI53-CBACN	369B1690P0327	0.79
	369B1690P0328	

	369B1690P0329	
	369B1690P0330	
MAI54-CBACN	369B1690P0327	0.79
	369B1690P0328	
MHT50-CBACN	369B1690P0327	0.79
	369B1690P0328	
MHO50-CBACN	369B1690P0327	0.79
	369B1690P0328	
MAO50-CBACN	369B1690P0327	0.79
	369B1690P0328	
MDI50-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MDI52-CBACN	369B1690P0327	0.79
	369B1690P0328	
MDI53-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MDI50A-CBACN	369B1690P0329	0.79
	369B1690P0330	
	369B1690P0331	
	369B1690P0332	
MDO53-CBACN	369B1690P0331	0.79
	369B1690P0332	
	369B1690P0333	
	369B1690P0334	
MDO55-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MVP50-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MVP50-CBBCN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MVP51-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MVP52-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	

MVP53-CBACN	N/A	N/A
MSP50-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MSP51-CBACN	369B1690P0327	0.79
	369B1690P0328	
	369B1690P0329	
	369B1690P0330	
MLP50-CBACN	N/A	N/A
MCD50-CBACN	N/A	N/A
MCD51-CBACN	369B1690P0352	0.56
MPU55-CBACN	N/A	N/A
MPU56-CBACN	N/A	N/A
MPU57-CBACN	N/A	N/A
BLP50-CBACN	369B1690P0331	0.79
	369B1690P0332	
BVP53-CBACN	369B1690P0331	0.79
	369B1690P0332	
	369B1690P0333	
	369B1690P0334	
2003-CBACN	369B1690P0201	0.56
	369B1690P0230	1.02
TCBT-CBACN	N/A	N/A
TCBB-CBACN	N/A	N/A
SDO60-CBACN	N/A	N/A
BSDO60-CBACN	369B1690P0370	0.79
	369B1690P0371	
	369B1690P0372	
	369B1690P0373	
SPU60-CBACN	N/A	N/A
BSPU60-CBACN	N/A	N/A
SAI60-CBACN	N/A	N/A
BSAI60-CBACN	369B1690P0327	0.79
	369B1690P0328	
SDI60-CBACN	N/A	N/A
BSDI60-CBACN	369B1690P0366	0.79
	369B1690P0367	
	369B1690P0368	
	369B1690P0369	

7.0 HAZARDOUS AREA OPERATION AND MAINTENANCE

Disconnecting the Nexus OnCore modules' signals or power inputs in hazardous areas has the possibility of creating dangerous spark conditions. Installations and maintenance tasks performed in potentially hazardous areas must be performed only after the area has been verified to be free of hazardous materials, atmospheres, and conditions.

Multiple energy sources may be connected to the Nexus OnCore modules. Ensure that all relay contacts, signals, and power inputs have been de-energized whenever operations requiring the Nexus OnCore modules to be powered down are performed.

The Nexus OnCore Modules do not utilize hazardous materials in its construction. In the event of a catastrophic failure, there are no unique measures to be undertaken in order to contain hazardous materials.

The Nexus OnCore modules meet the requirements for application in T4 environments. Regardless of operating environment, caution should be taken related to surface temperature by anyone performing maintenance procedures that may require handling system components as the hazard of burns may exist.

Wiring to or from the Nexus OnCore modules, which enters or leaves the system enclosure, must utilize wiring methods suitable for Class I, Division 2, and Class I, Zone 2 hazardous locations as appropriate for the installation.

8.0 SPECIFIC CONDITIONS OF SAFE USE

The specific conditions of safe use that must be followed, observed, and maintained by manufacturer, installer, and/or operator of the Nexus OnCore modules are shown below:

- The Programmable Control and I/O Modules shall be installed in a suitable ATEX certified Ex e, and minimum ingress protection IP54 enclosure as per the instructions, parts, and specifications provided in Service Manual.
- The end use enclosure shall be tool secured and shall not be opened in the presence of ignitable concentration of explosive gas atmosphere and do not connect/ disconnect this device unless the power has been switched off or the area is deemed to be non-hazardous. Grounding/Bonding wire shall be provided.
- The Programmable Control and I/O Modules shall only be powered by a secondary circuit not exceeding 24V.

9.0 MARKING INFORMATION

9.1 Marking Requirements

Labels and markings are provided on the Nexus OnCore modules to guide the system integrator in the processes of choosing appropriate interface equipment, determining safe use conditions, and identifying recommended installation procedures. The areas where the Nexus OnCore modules are certified for use are marked in a prominent location.

The Marking on the Nexus OnCore modules shall contain the following:

- a) Manufacturer's name
- b) Manufacturer's type identification
- c) The symbol Ex
- d) Ex "ec, nC", EPL: Gc
- e) Group IIC
- f) Certificate number
- g) The symbol "X"
- h) Ex ec nC IIC T4 Gc,
-20 °C ≤ Ta ≤ +50 °C
- i) Includes all required markings per IEC 60079-7 and IEC 60079-15.

9.2 Small Module Exception

For any modules that are too small to carry all of these markings (see Figure 2 below). The smaller label contains a minimum amount of information and an "X", and the certifications and markings that cannot fit on these small labels are listed in this section for reference:

II 3 G Ex ec nC IIC T4 Gc

Ex ec nC IIC T4 Gc

Class I Division 2, Group A, B, C, D T4

Class I, Zone 2, AEx ec nC IIC T4 Gc

-20°C ≤ Tamb ≤ +50°C

IECEX: IECEX ETL 20.0070X

ATEX: ITS-I21ATEX28912X

CAN: ETL21CA104403637

UKEX: ITS21UKEX0289

Cert. to CSA STD C22.2# 60079-0; Conf to UL STD 60079-0

Cert. to CSA STD C22.2# 60079-7; Conf to UL STD 60079-7

Cert. to CSA STD C22.2# 60079-15; Conf to UL STD 60079-15

Cert. to CSA STD C22.2# 61010-1-12; Conf to UL STD 61010-1

9.3 Label Examples

The Nexus OnCore module will have approvals labels which indicate the agencies that have approved the modules for use, displayed prominently. Examples of the full size approvals label is displayed below as Figure 1, and the reduced size label for small modules shown below as Figure 2:

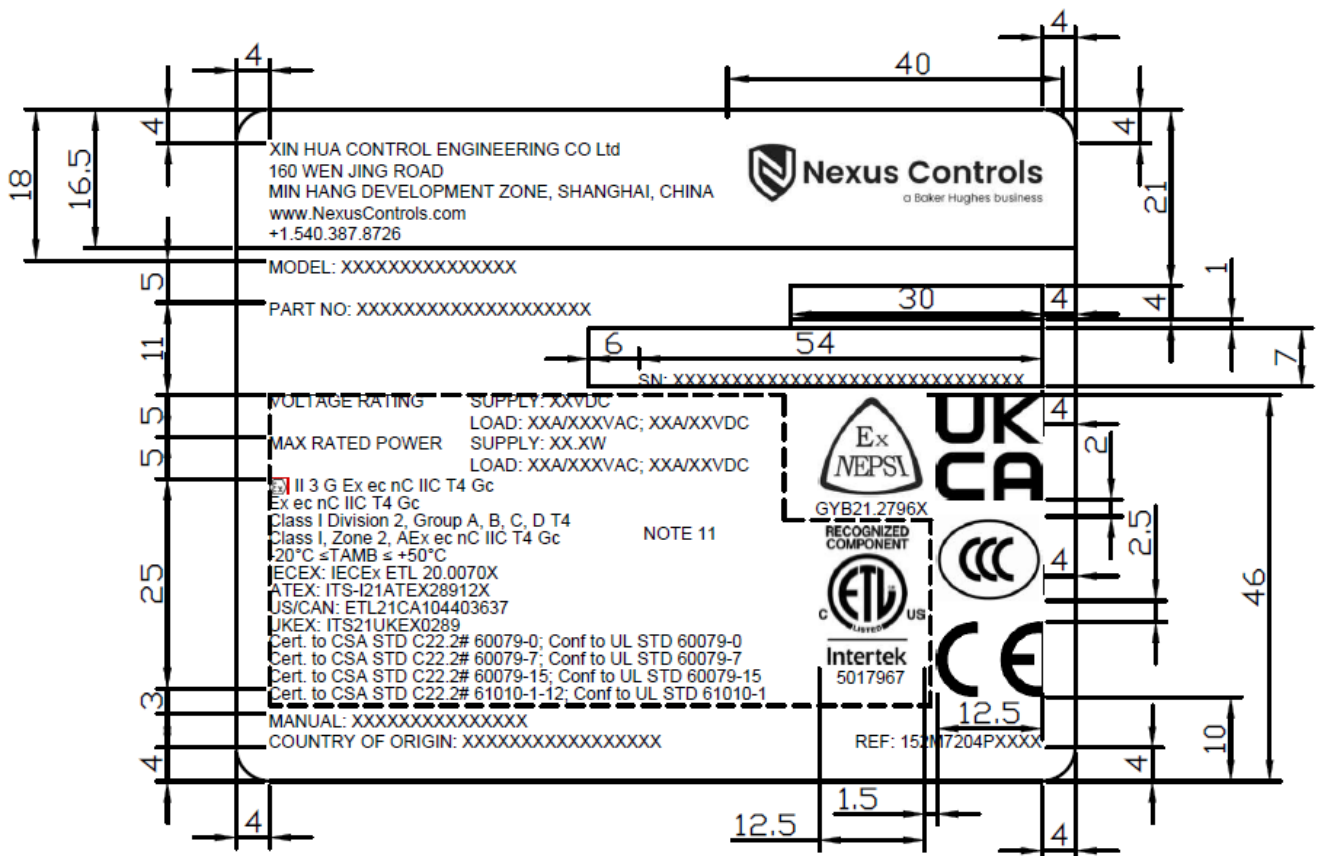


Figure 1: Example Nexus OnCore Module IECEx Nameplate

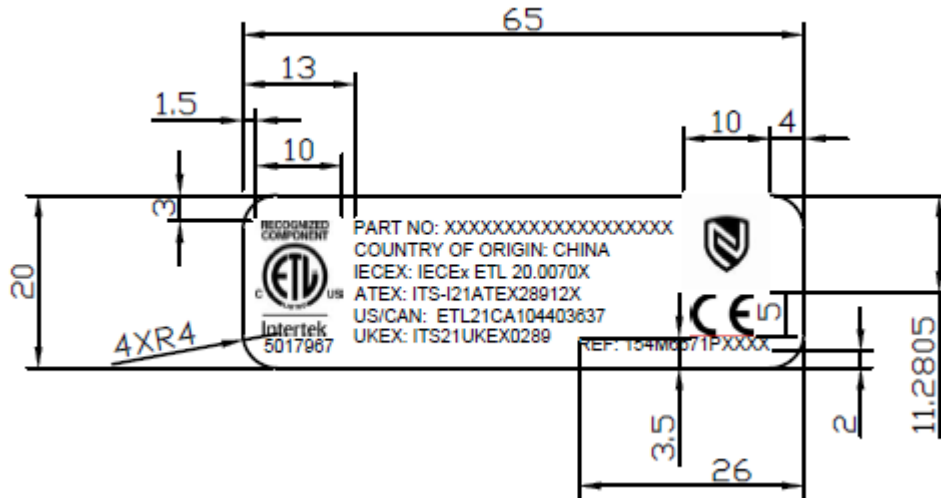


Figure 2: Example of Reduced Size Nexus OnCore Module IECEx Nameplate

The Nexus OnCore Modules will also have a warning label applied to them as shown as Figure 3 below:



Figure 3: Example Nexus OnCore Module Refer to Manual Label

Due to space limitations on the modules themselves the complete verbiage for this label is shown below in this manual in English and in French:

“WARNING – EXPLOSION HAZARD – Do not disconnect equipment unless the power has been switched off and the area is known to be non-hazardous.”

“L’AVERTISSEMENT – RISQUE d’EXPLOSION – ne déconnectent pas l’équipement à moins que le courant ait été coupé et le secteur est connu pour être non-dangereux.”

10.0 CONTACT INFORMATION

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