

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

TRICONEX

3008N

ENHANCED MAIN PROCESSOR MODULE

Used with the applicable Triconex safety system configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

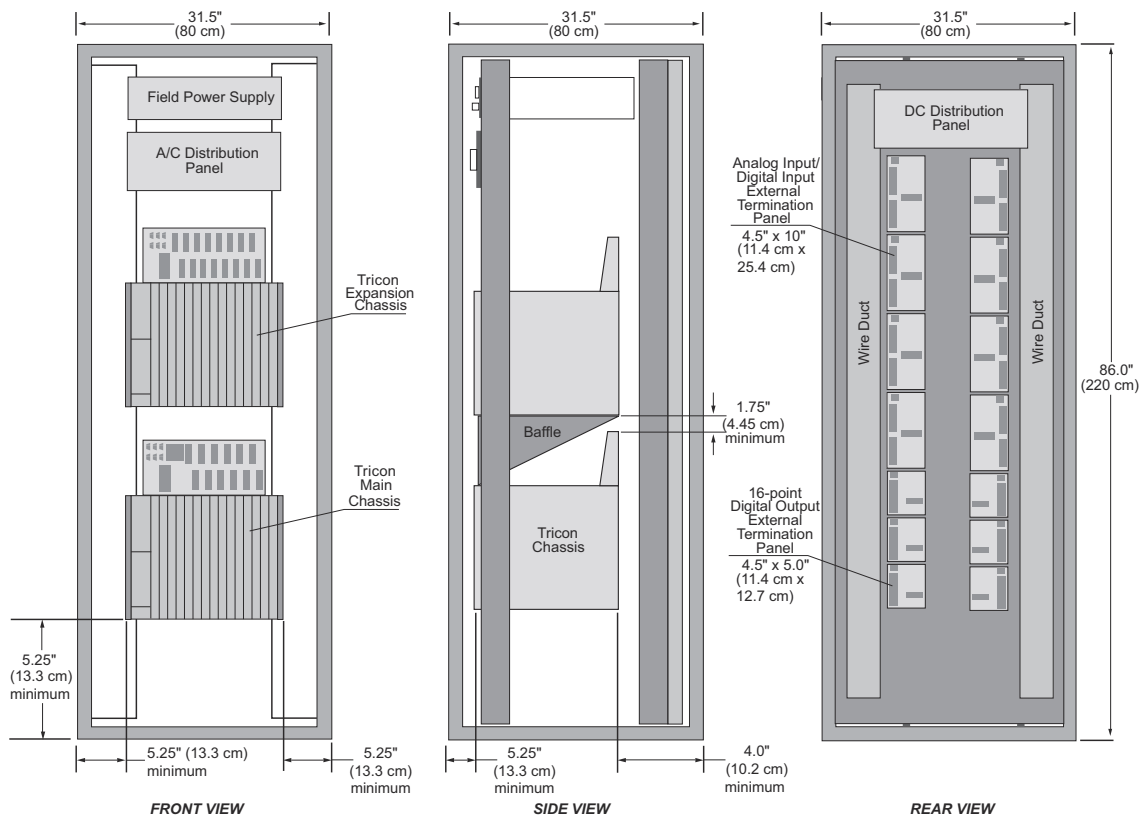
Source: Tricon Technical Product Guide

Tricon v10.x Equipment Certified for Use in Nuclear 1E Applications

Invensys has qualified specific Tricon version 10 products for use in 1E (safety-related) applications in nuclear power plants in accordance with EPRI Report TR-107330, “Generic Requirements Specification for Qualifying Commercially Available PLC for Safety-Related Applications in Nuclear Power Plants.” EMC testing was performed in accordance with USNRC Regulatory Guide 1.180, Revision 1, “Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems.”

All of the information (specifications, simplified schematics, installation guidelines, and so on) for standard equipment also applies to nuclear equipment. The following table lists the model numbers of Tricon v10.x equipment certified for use in Nuclear 1E applications and identifies the standard model to see for information about the equipment.

Model Number	Description	See This Standard Model
Modules^a		
8110N2	Main Chassis	8110
8111N	Expansion Chassis	8111
8112N	Remote Expansion Chassis	8112
8310N2	High-Density Power Module, 120 V	8310
8311N2	High-Density Power Module, 24 VDC	8331
8312N2	High-Density Power Module, 230 VAC	8312
3008N	Enhanced Main Processor III, 16 Mb	3008
4200N	Remote Extender Module	4200
4200-3N	Remote Extender Module (Set)	4200-3
4201N	Remote Extender Module	4201
4201-3N	Remote Extender Module (Set)	4201-3
4352AN	Tricon Communication Module (TCM)	4352A
4352BN	Tricon Communication Module (TCM)	4352B
3701N2	0–10 VDC, Differential DC Coupled, TMR	3701
3703EN	0–5 VDC or 0–10 VDC, Differential, Isolated, TMR	3703E
3721N	0–5 VDC or –5 to +5 VDC, Differential, DC Coupled, TMR	3721
3805HN	4–20 mA, Current Loop, DC Coupled, TMR	3805H
3501TN2	115 VAC, Opto-isolated, Non-commoned, TMR	3501T
3502EN2	48 VAC/VDC, Commoned in Groups of 8, Self-Test, TMR	3502E
3503EN2	24 VAC/VDC, Commoned in Groups of 8, Self-Test, TMR	3503E
3601TN	115 VAC, Opto-isolated, Non-commoned, TMR	3601T
3603TN	120 VDC, Opto-isolated, Commoned, TMR	3603T
3607EN	48 VDC, Opto-isolated, Non-commoned, TMR	3607
3623TN	120 VDC, Opto-isolated, Commoned, Supervised, TMR	3623T
3625N	24 VDC, Supervised/Non-supervised, Commoned, TMR	3625
3511N	Pulse Input, Differential, AC Coupled, TMR	3511
3708EN	Thermocouple, Differential, Isolated, TMR	3708
3636TN	Relay Output, Normally Open, Non-triplicated	3636T
8105N	Blank Module Panel	8105



Typical Dimensions and Clearances for Chassis Installation with External Terminations

NOTE

*This drawing shows a typical set-up for external termination panels—other set-ups are possible.
Please contact the Invensys Global Customer Support (GCS) center for details.*

Clearances

Invensys recommends that you leave a minimum of 5.25 inches (13.3 centimeters) of space between the enclosure panels and the bottom screen, sides, and front of each chassis, and a minimum of 5.25 inches (13.3 centimeters) of space between the top screen of each chassis and any obstructions to airflow.

Mounting Tricon Chassis in Enclosures

Invensys will mount Tricon chassis in any of the industry-standard enclosures listed below. (Please contact Invensys regarding other enclosures, available for additional engineering and documentation charges.) See page 14 for a photograph of Tricon chassis and terminations mounted in a sample enclosure.

Enclosures Typically Supported by Invensys*

Type	Width	Depth	Height
Rittal NEMA 12	31.5 inches (800 mm)	31.5 inches (800 mm)	86.0 inches (2,200 mm)
	31.5 inches (800 mm)	31.5 inches (800 mm)	78.0 inches (2,000 mm)
MarkHon NEMA 1	31.5 inches (800 mm)	31.5 inches (800 mm)	85.0 inches (2,160 mm)

* Other sizes are available. Please contact Invensys for more information.

General Environmental and EMC Specifications

Other than the optional conformal coating of all PCB assemblies, the Tricon controller is not explicitly protected against dust or falling debris. Atmospheric and airborne-particle protection must be provided by housing the Tricon controller in an appropriate NEMA-rated enclosure.

Operating Temperature	32° to 140° F (0° to 60° C), ambient, as measured at the bottom of the chassis, per IEC 60068-2-1 Test Nb
Storage Temperature	-40° to 167° F (-40° to 75° C), per IEC 60068-2-14, Test Na
Relative Humidity	5% to 95%, non-condensing, per IEC 60068-2-2, Test Bb, and IEC 60068-2-3 test Db
Corrosive Environment	Class G3 Level as defined in ISA Standard S71.04, based on exposure testing according to EIA Standard 364-65A, Class IIIA
Sinusoidal Vibrations per Axis	2 G @ 10 to 150 Hz, per IEC 60068-2-6, Test Fc
Shock	15 G for 6-11 ms in each axis, per IEC 60068-2-27
Electrostatic Discharge	IEC 61000-4-2, 8 kV air, 4 kV contact
Conducted Susceptibility	IEC 61000-4-4, Fast Transient/Burst, 2 kV power, 1 kV signal lines and IEC 61000-4-5, Surge Withstand, 2 kV CM AC power lines, etc. IEC 61000-4-6, RFI, 0.15-80 MHz, 10V
Radiated Susceptibility	IEC 61000-4-3, 26-1000 MHz, 10 V/m and IEC 61000-4-8, 50-60 Hz, 30 A/m
Conducted Emissions	CISPR 16, Class A, 0.15-30 MHz, 73-79 db when installed per the guidelines of the <i>P&I Guide</i>
Radiated Emissions	CISPR 11, Class A, 30-1000 MHz @ 10 m, 4-47 db when installed per the guidelines of the <i>P&I Guide</i>
Cable Flame Test Rating ^a	Interface cables (connect external termination panels to I/O modules): FT4 Vertical Flame Test-Cables in Cable Trays per C.S.A. C22.2 No. 0.3-92 Para 4.11.4 ^b I/O bus cables (connect chassis): FT6 Horizontal Flame & Smoke Test-per C.S.A. C22.2 No. 0.3-92 Appendix B ^c

a. Applies to cables shipped after April 1, 2009.

b. Cables will be marked with FT4 or CMG rating, but they all actually meet the more stringent FT4 rating.

c. Cables will be marked with FT6 or CMR rating, but they all actually meet the more stringent FT6 rating.