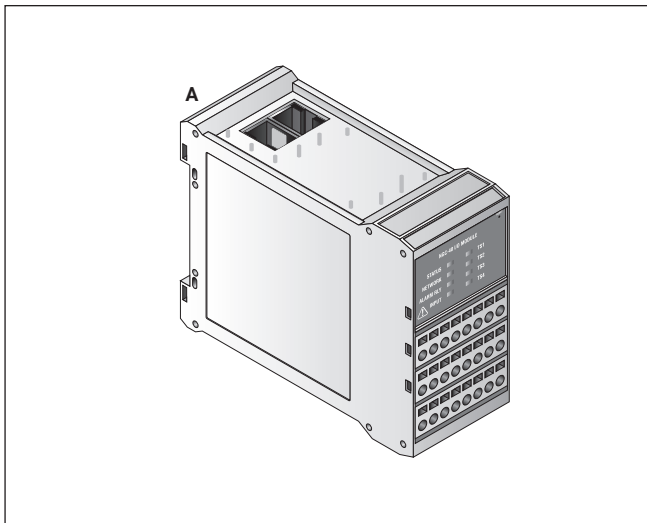




RAYCHEM

NGC-40-IO

Control and Monitoring Modules for use with nVent RAYCHEM NGC-40 System Installation Instructions



DESCRIPTION

The nVent RAYCHEM NGC-40-IO provides up to four additional RTD inputs. These additional RTD inputs can be assigned to any NGC-40-HTC/HTC3. The NGC-40-IO also has one digital input and one alarm relay.

TOOLS REQUIRED

- Small flat-blade screwdriver

ADDITIONAL MATERIALS

- Power supply 24 Vdc @100 mA per NGC-40-IO
- Custom built CAN cables with RJ-45 connections
- CAN Termination Resistor

KIT CONTENTS

Item	Qty	Description
A	1	NGC-40-IO module

APPROVALS AND CERTIFICATIONS

Hazardous Locations



Class I, Div. 2, Groups A,B,C,D T4
 Class I, Zone 2, AEx nC IIC T4 IP20
 Ex nL nC IIC T4 X
 -40°C ≤ Ta ≤ +65°C

Conforms to:
 FM Class Number 3600 (11/98)
 FM Class Number 3611 (10/99)
 ANSI/UL STD. 60079-15-2009
 UL STD. 61010-1

Certified to:
 CAN/CSA STD. C22.2 No. 213-M1987 (R2004)
 CAN/CSA STD. C22.2 No. 61010-1:2004
 EN 61010-1 (2001)
 CAN/CSA STD. E60079-15:02 (R2006)

IEC Ex Markings:
 IEC Ex ETL17.0062X
 Ex ec nC IIC T4 Gc

ATEX Markings:
 ITS17ATEX402833X
 Ⓜ II 3 G Ex ec nC IIC T4 Gc



Special conditions of use:

- The overall equipment is evaluated to type of protection "ec". Sealed devices in the form of relays are additionally present in module NGC-40-IO and comply with requirements for the type of protection nC.
- For full connection details see these installation instructions.
- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC/EN 60664-1.
- The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP54 in accordance with IEC/EN 60079-0.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.

⚠ WARNING:

This component is an electrical device that must be installed correctly to ensure proper operation and to prevent shock or fire. For technical support, call nVent at (800) 545-6258.

GENERAL

Supply voltage	24 Vdc \pm 10%
Internal power consumption	< 2.4 W per NGC-40-IO
Ambient operating temperature	-40°C to 65°C (-40°F to 149°F)
Ambient storage temperature	-55°C to 75°C (-67°F to 167°F)
Environment	PD2, CAT III
Max. altitude	2,000 m (6,562 ft)
Humidity	5 – 90% noncondensing
Mounting	Din Rail – 35 mm

ELECTROMAGNETIC COMPATIBILITY

Emissions	EN 61000-6-3 Emission standard for residential, commercial and light industrial environments
Immunity	EN 61000-6-2 Immunity standard for industrial environments

TEMPERATURE SENSORS

Type	100 Ω platinum RTD, 3-wire, α = 0.00385 ohms/ohm/°C Can be extended with a 3-conductor shielded cable of 20 Ω maximum per conductor 100 Ω , Ni-Fe, 2-wire Can be extended with a 2-wire shielded cable of 20 Ω maximum per conductor
Quantity	Up to four wired directly to each NGC-40-IO module

ALARM RELAY

Dry contact relay (voltage free)	Relay contact rated 250 V / 3 A 50/60 Hz (EC) and 277 V / 3 A 50/60 Hz (cCSAus). Output is user programmable to flash. NO and NC contacts available.
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DIGITAL INPUT

Multi-purpose input	Multi-purpose input for connection to external dry (voltage-free) contact or DC voltage. May be user programmable for: not used / force off / force on functions. It can be configured to be active open or active closed.
Max. input voltage	24 Vdc

CAN NETWORKING PORT

Type	2-wire isolated CAN-based peer-peer network. Isolated to 300 V.
Connection	Two 8-pin RJ-45 connectors (both may be used for Input or Output connections)
Protocol	Proprietary NGC-40
Topology	Daisy chain
Length	10 m (33 ft) maximum
Quantity	Up to 80 HTC/HTC3 and IO modules per network segment
Address	Unique, factory assigned

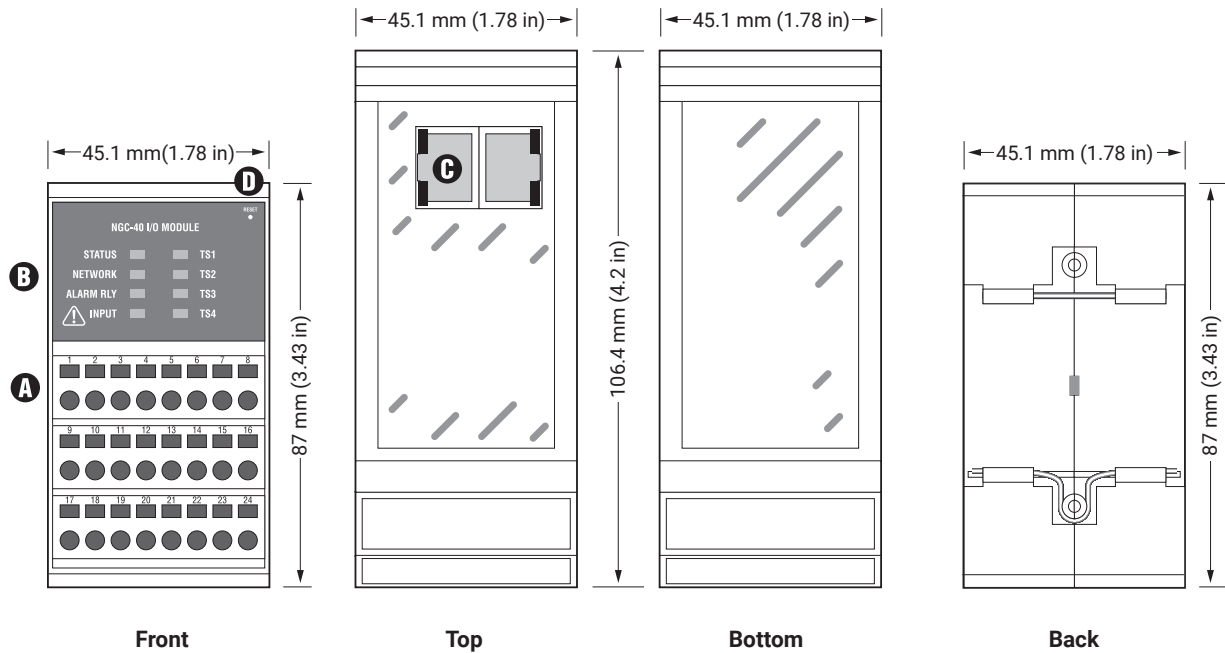
CONNECTION TERMINALS

Wiring terminals	Cage clamp, 0.5 to 2.5 mm ² (24 to 12 AWG)
CAN networking and module power	Two RJ-45s, one each IN and OUT. Provides CAN bus signals and +24 Vdc power.

HOUSING

Size	45.1 mm (1.78 in) wide x 87 mm (3.43 in) high x 106.4 mm (4.2 in) deep
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System Components



A. WIRING TERMINALS

TERMINALS	FUNCTION
1 – 3	Alarm relay
4 – 6	Not used
7 – 8	Digital input
9 – 12	TS1 (RTD1)
13 – 16	TS2 (RTD2)
17 – 20	TS3 (RTD3)
21 – 24	TS4 (RTD4)

WARNING: Shock Hazard. Disconnect from live voltage prior to accessing terminals

B. STATUS LEDs

STATUS: Indicates status of IO module

Off	No power
Green	OK/Normal
Yellow	Configuration mode
Red	Internal fault

NETWORK: Indicates CAN network activity

Off	No link detected
Green	Link OK, receive data packets
Yellow	Transmit data packets

ALARM RELAY:

Off	No alarm
Red	Alarm condition

INPUT: Shows status of digital input

Off	Input is inactive (open)
Green	Input is active (shorted)

TS1 FAIL TO TS4 FAIL

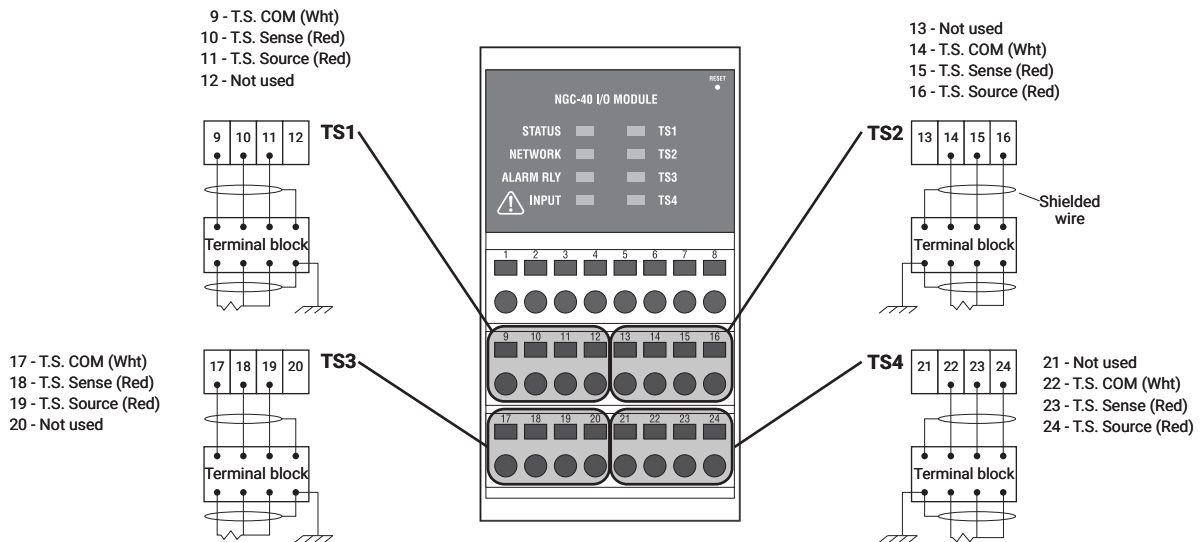
Off	Normal, no fault
Red	TS fail (open, shorted, out of range)

C. CAN BUS/MODULE POWER

D. RESET BUTTON

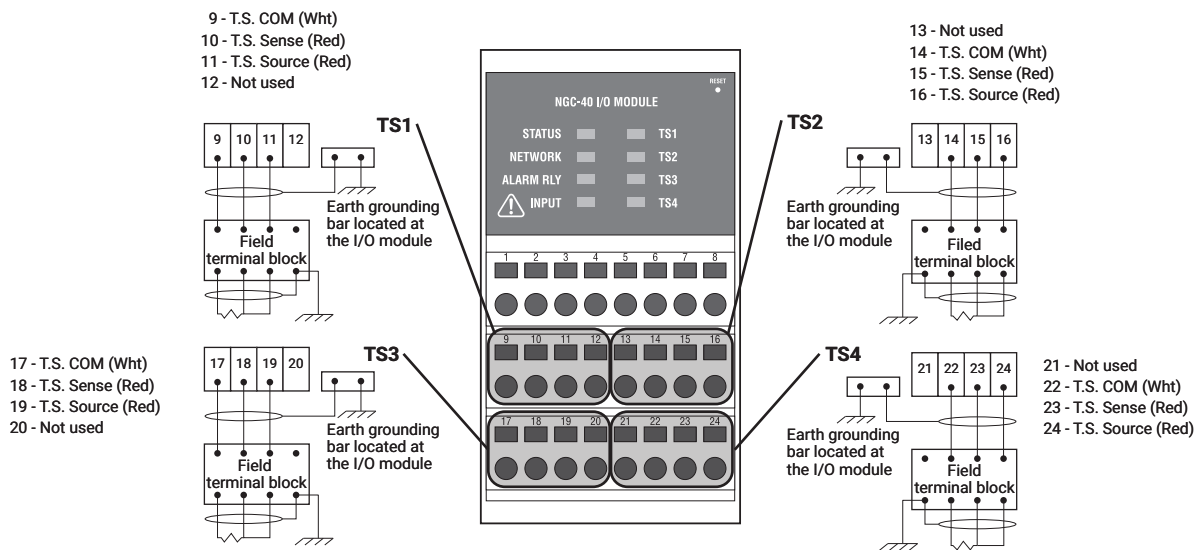
RTD Input Connections – North American Installation Technique

The RTD field wires must be terminated on a panel mounted terminal block. No ground wire should be terminated on terminals 12, 13, 20 and 21. Terminate RTD shields at the panel mounted terminal block to chassis ground.



RTD Input Connections – European Installation Technique

The RTD field wires must be terminated on a panel mounted terminal block. No ground wire should be terminated on terminals 12, 13, 20 and 21. Terminate RTD shields at the panel mounted field terminal block to chassis ground. The RTD cable shield from the field terminal block to the I/O module should be terminated at the earth ground bar located near the module.

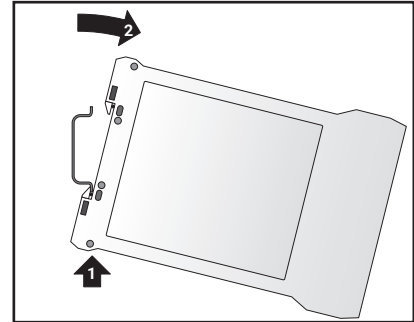
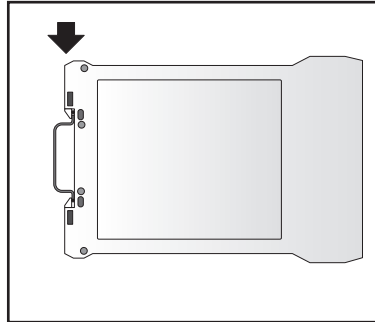
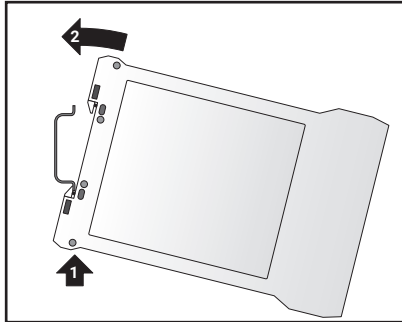


Mounting the NGC-40-PTM

Each nVent RAYCHEM NGC-40-PTM mounts on a DIN 35 rail.

MOUNTING: Insert the rear bottom of the module into the DIN rail, then push up and inwards to engage the clip.

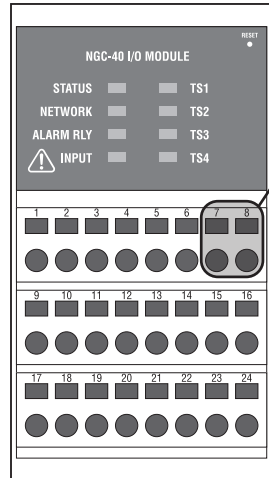
REMOVAL: Push the module upwards to disengage the clip, then rotate the module toward you.



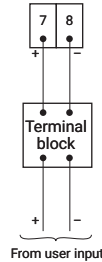
Digital Input Connections – North American and European Installation Techniques

The digital input terminal block provides input for connection to external dry (voltage-free) contact or DC voltage.

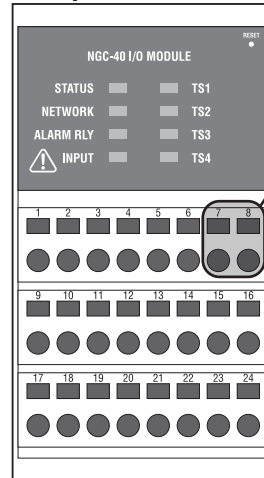
North American Installations



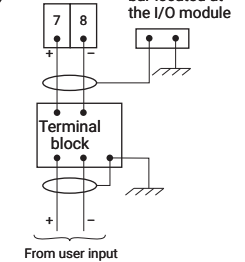
Digital Input



European Installations



Digital Input



Alarm Relay

The common alarm provides a form C contact, rated at 277 V, max 3 A.

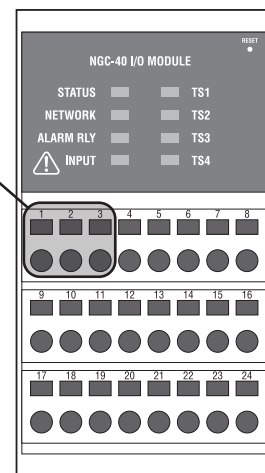
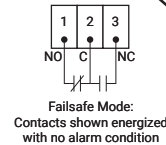
The alarm relay is configured as Fail Safe.

The NO (normally open) contact is open in non-energized condition. When energized, it closes during normal conditions and will open upon an alarm condition or power failure.

The NC (normally closed) contact is closed in non-energized condition. When energized, it opens during normal conditions and will close upon an alarm condition or power failure.

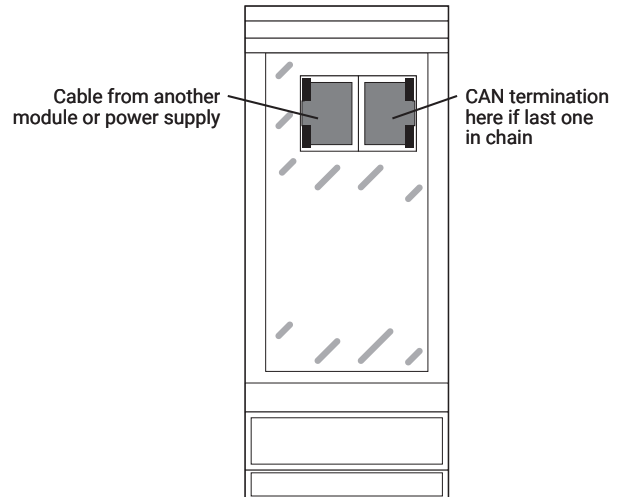
⚠ WARNING: Shock Hazard. Disconnect from live voltage prior to accessing terminals.

Alarm Relay



CAN Networking Port

The CAN termination device must be installed in the unused port of the last module.



Provide Suitable Panel Enclosure, and Determine Locations for NGC-40-IO Assembly in Panel*

1. Provide suitable panel enclosure

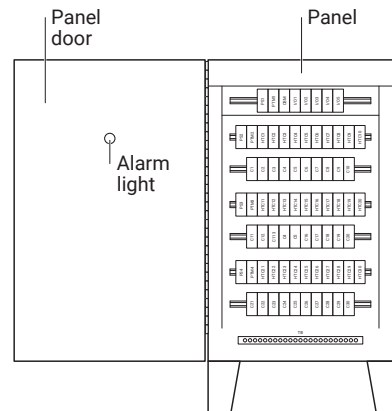
The nVent RAYCHEM NGC-40-IO must be mounted in an enclosure to protect its electronic components. For indoor applications, use a minimum NEMA 1 enclosure (NEMA 12 recommended). For outdoor applications, use a NEMA 4 or NEMA 4X enclosure depending on the requirements.

Note: The NGC-40-IO is designed for operation in ambient temperatures from -40°C to 65°C (-40°F to 149°F). If the ambient temperature is outside this range, a space heater and/or cooling fan will be required in the panel.

2. Determine locations for the NGC-40-IO assembly in the electrical panel.

The NGC-40-IO should be located in the rear of the panel. The NGC-40-IO assembly is an electronic unit and must not be located where it will be exposed to strong magnetic fields or excessive vibration.

*North American panel installation techniques



Servicing

The NGC-40-IO contains no user serviceable parts. Contact your nVent representative for service and an RMA number if required.

WARNING—EXPLOSION HAZARD—SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2 HAZARDOUS AND NONHAZARDOUS LOCATIONS

WARNING—EXPLOSION HAZARD—DO NOT REPLACE NGC-40-PTM UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS

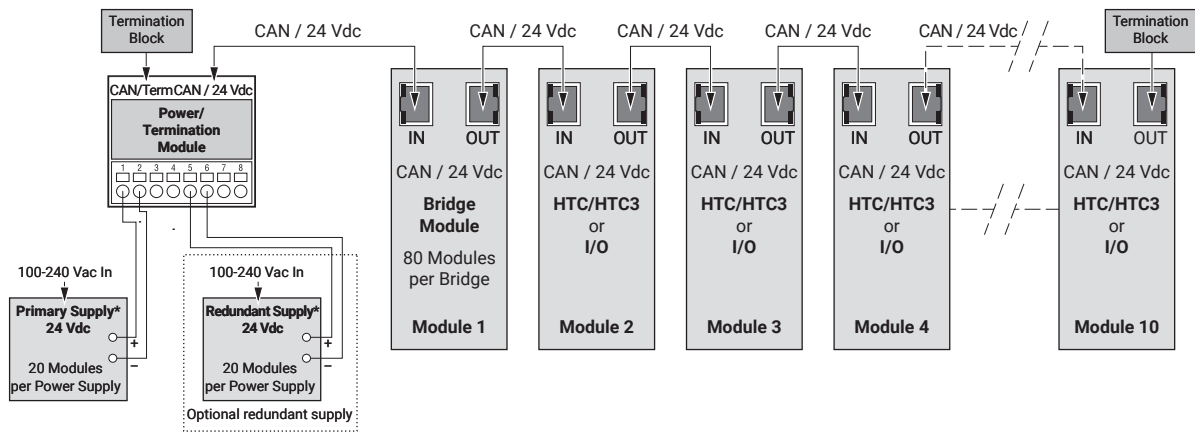
WARNING—EXPLOSION HAZARD—DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS

AVERTISSEMENT—RISQUE D'EXPLOSION—LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2

AVERTISSEMENT—RISQUE D'EXPLOSION—COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX AVANT DE REPLACER LE NGC-40-PTM

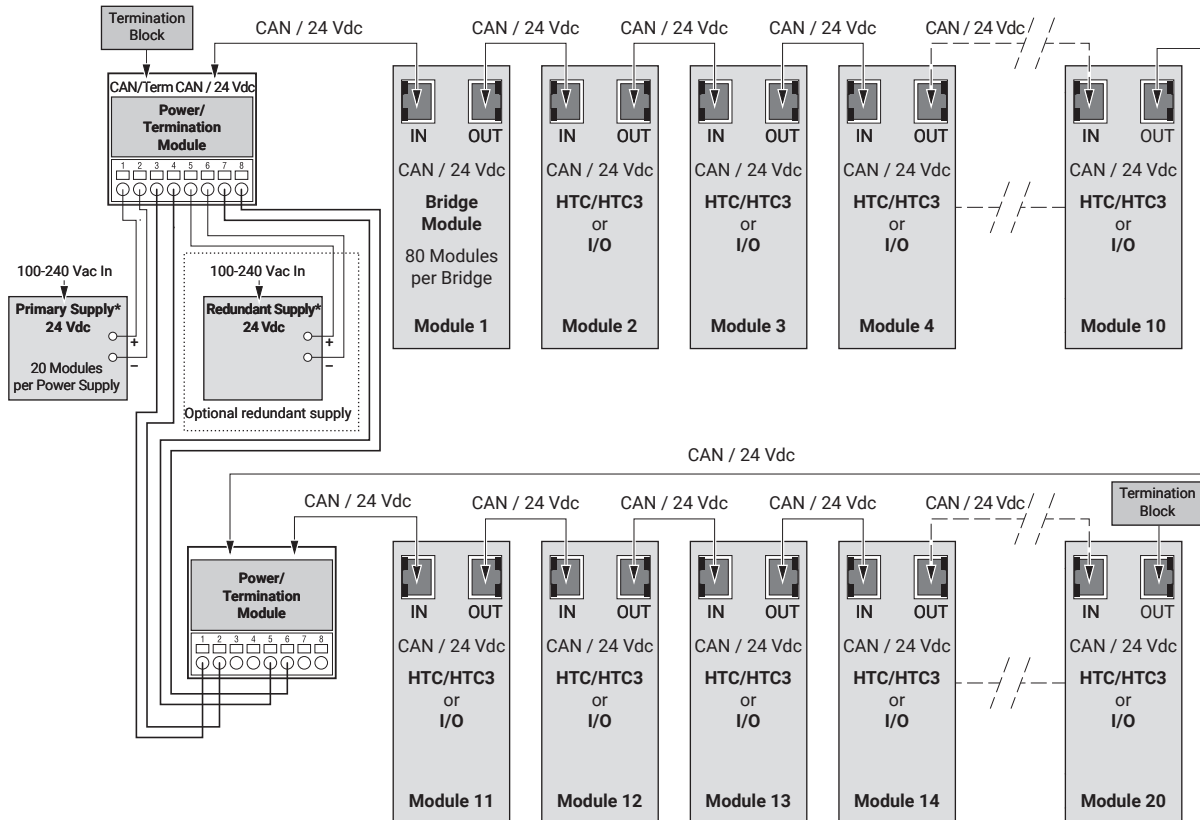
AVERTISSEMENT—RISQUE D'EXPLOSION—AVANT DE DÉCONNECTER L'EQUIPEMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX

NGC-40 CAN Bus Connections for Up to 10 Modules



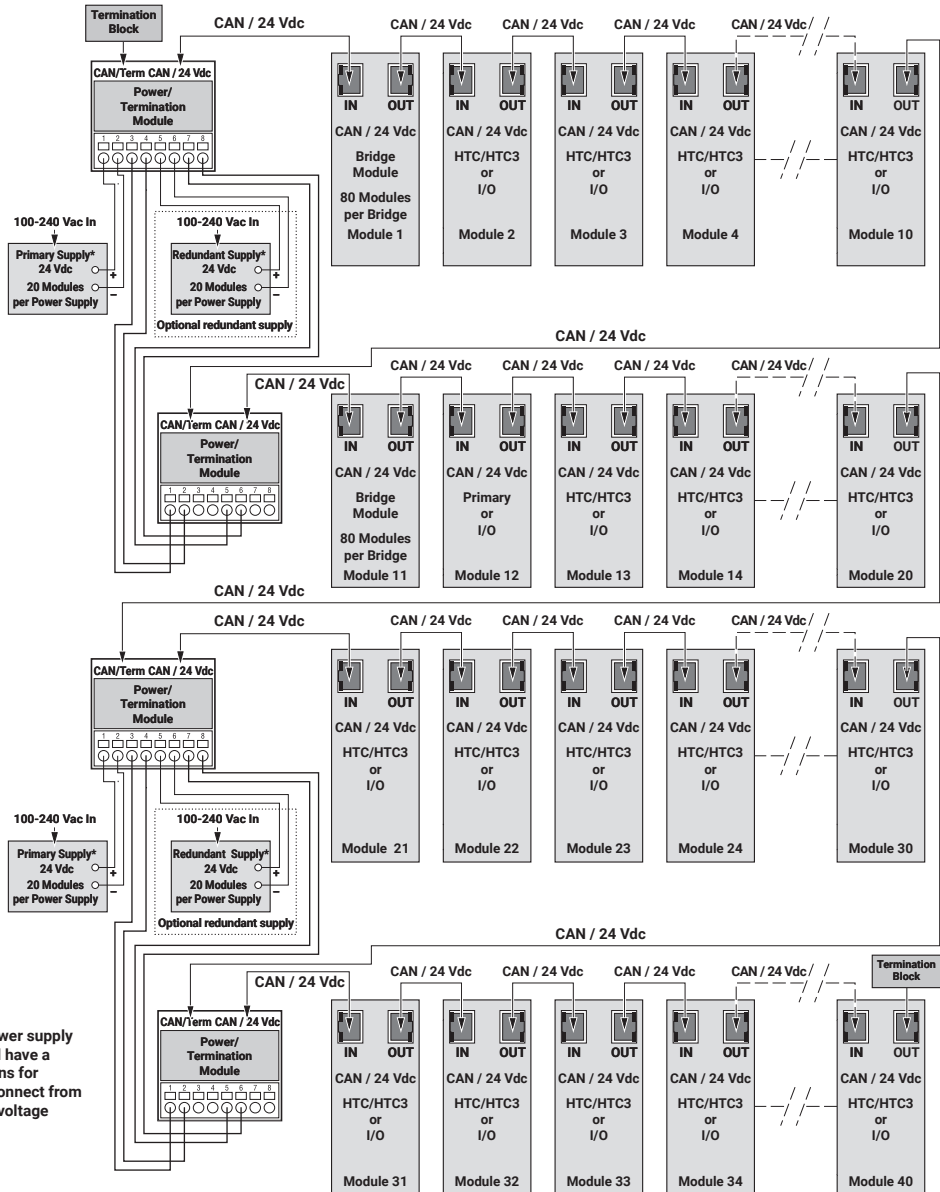
* Power supply shall have a means for disconnect from line voltage

NGC-40 CAN Bus Connections for Up to 20 Modules



* Power supply shall have a means for disconnect from line voltage

NGC-40 CAN Bus Connections for Up to 40 Modules



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