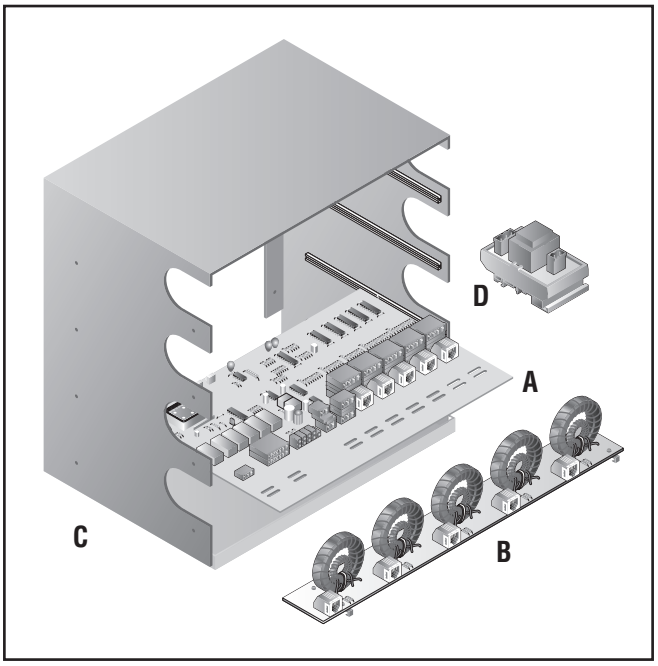
DigiTrace®

NGC-30-CR
NGC-30-CRM
NGC-30-CRMS
NGC-30-CTM
NGC-30-CVM

Control and monitoring modules for use with DigiTrace NGC-30

Installation Instructions



Description

The DigiTrace® NGC-30 is a multi-circuit electronic control, monitoring and power distribution system for heat-tracing used in process-temperature maintenance and freeze-protection applications. The NGC-30-CRM/-CRMS and NGC-30-CTM provide ground-fault and line current sensing, alarming, switching and RTD inputs for five heat-tracing circuits when used with the NGC-UIT. The NGC-30-CRM is to control mechanical contactors and the NGC-30-CRMS is used to control solid state relays (SSRs).

Tools Required

- Screw driver small blade - standard
- RJ11 stripping/crimping tool
- Wire cutters
- RJ11 connectors

Additional Materials

- Power supply - 12 Vdc @ 400 mA-per NGC-30-CRM/-CRMS board
- RJ11 4 conductor cable

Kit Contents

Item	Qty	Description
A	1	NGC-30-CRM or CRMS (card rack module with connectors)
B	1	NGC-30-CTM (current transformer module)
C	1	NGC-30-CR (card rack)
D	1	NGC-30-CVM (voltage monitoring module) - optional

General

Approvals/Certifications

Hazardous locations

Class I, Div. 2, Groups A,B,C,D
Ex nC IIC T5
Class I, Zone 2, AEx nC IIC T5

Supply Voltage	12 Vdc ± 10%
Internal power consumption	< 5 W per NGC-30-CRM/-CRMS
Ambient operating temperature	–40ºC to 60ºC (–40ºF to 140ºF)
Ambient storage temperature	–40ºC to 75ºC (–40ºF to 167ºF)
Environment	PD2, CAT III
Max. altitude	2000 m
Humidity	0 – 90% non-condensing

Electromagnetic Compatibility

Emission	Tested to Class A (Industrial Environments). Under CE standard EN 61000-6-4:2001
Immunity	Tested to CE 61000-6-2

Temperature Sensors

Type	100-ohm platinum RTD, 3-wire, α = 0.00385 ohms/ohm/ºC Can be extended with a 3-conductor shielded cable of 20 ohm maximum per conductor
Quantity	Up to 5 3-wire pt100´s wired directly to each NGC-30-CRM/-CRMS

Current Sensors

Mounting	Din Rail – 35 mm
Quantity per NGC-30-CTM	Five for ground-current measurement Five for line current measurement

Line Current Sensors

Max current	60A
Accuracy	± 2% of reading

Ground Fault Sensor

Range	10 – 200 mA
Accuracy	± 2% of range

Voltage Sensor

Range	80 – 290 Vac 50/60 Hz
Accuracy	± 1% of span

Outputs

CRM output relays	Form A 3-Amp @ 277 Vac max 50/60 Hz
CRMS SSR outputs	12 Vdc @ 30 mA max per output
Alarm Relay	SPDT 3-Amp @ 277 Vac max 50/60 Hz

Communication to NGC-UIT

Type	2 wire RS-485
Cable	One shielded twisted pair
Length	1200 M (4000 ft.) maximum
Quantity	Up to 52* NGC-30-CRM/-CRMS may be connected to one NGC-UIT

Connection Terminals

Power supply/Pilot Relay/ RTD/Comm Port (RS485)	18 – 12 AWG (0.8 - 3.3mm^2)

* May require repeaters

⚠ WARNING:

This component is an electrical device that must be installed correctly to ensure proper operation and to prevent shock or fire. Read these important warnings and carefully follow all of the installation instructions.

- Component approvals and performance are based on the use of Tyco Thermal Controls-specified parts only. Do not use substitute parts.
- Keep components dry before and during installation.
- Leave these instructions with the end user for reference and future use.

For technical support, call Tyco Thermal Controls at + 00 32 16 213511 or your local representative.

Cleaning Instructions

If dust accumulates on the NGC-30-CRM/-CRMS circuit board use dried compressed air to remove the dust. Turn off all power to the NGC-30 panel. Carefully disconnect all cables from a single NGC-30-CRM/-CRMS card, making sure to label cables so that they can be reconnected after board cleaning. Wear an anti-static wrist strap connected to ground in order to avoid component damage. Remove the CRM/CRMS circuit card from the card cage and place on a clean lint-free surface.

Use dry compressed air from a can for cleaning circuit boards. (Avoid factory compressed air since it may contain enough moisture or oil to cause permanent damage.) Use short quick blasts to remove dust build-up as necessary. After cleaning, replace the CRM/CRMS in the same card cage position and reconnect all cables. Remove only one card at a time for cleaning to avoid any problems during re-installation.

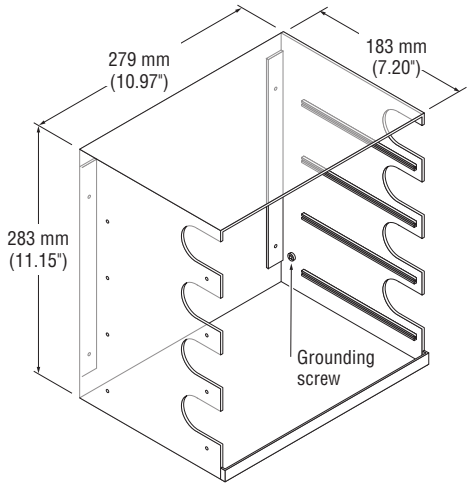
NGC-30-CR Installation Instructions

Mounting of Card Rack

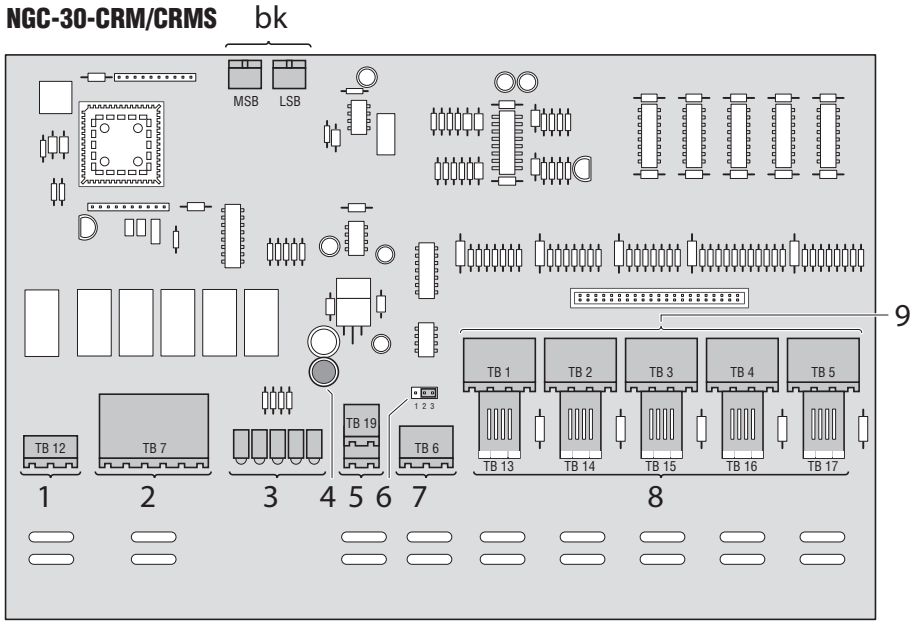
Use the mounting template (on page 7) to mount the rack on a panel backplane. There are four holes (0,48 cm dia.) to secure it to the mounting surface using #8 screws.

Once the card rack is installed, a earth bonding wire must be connected to the card rack using the ground screw provided.

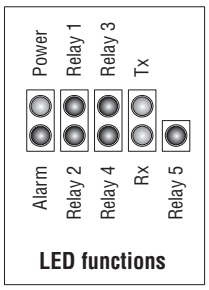
Note: The card rack must be installed on a non-combustible surface.

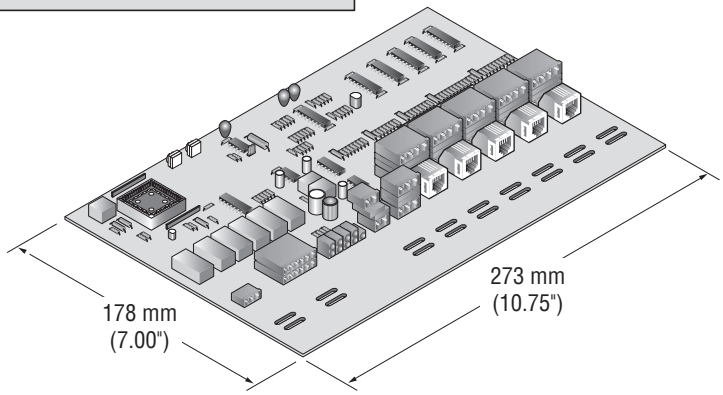


NGC-30-CRM/-CRMS Installation Instructions



1 Alarm output
2 Relay outputs (5x)
3 LEDs (9x)
4 Fuse
5 12 Vdc Inputs (2x)
6 End of Line (EOL) jumper
7 RS-485 Communications
8 Line & ground-fault sensor inputs (5x)
9 RTD Inputs
bk Address Switches

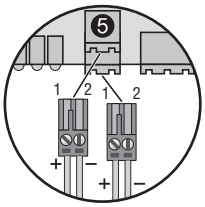




Power Supply

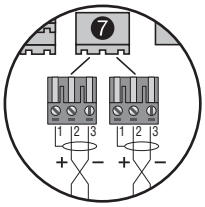
The power supply connector (TB19) is a dual two pin connector. Either connector allows for power in (pin #1 (+), pin #2 (–) and bussing of power to other NGC-30-CRM modules).

Note: Power supply must be sized correctly based on the number of NGC-30-CRM/-CRMS modules.



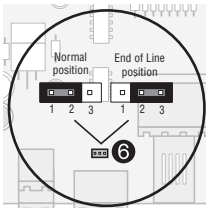
RS-485 Communications

The RS-485 connector (TB6) is a dual three pin connector. Either connector allows for RS-485 input signals (pin #1 (shield), pin #2 (+), pin #3 (–)) and bussing of RS485 signal to other NGC-30-CRM modules.

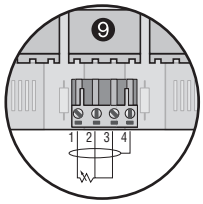


End of Line (EOL) Jumper

If this device (NGC-30-CRM/-CRMS) is the last device in the RS-485 network, the J1 jumper needs to be moved from terminals 1 & 2 to terminals 2 & 3.



RTD Inputs – Ordinary Area



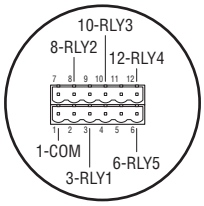
3 wire RTDs with shield may be connected to RTD Ch1 thru Ch 5 (TB1 - TB5). The two common wires (usually red, red) are connected to terminals 2 & 3, the source (usually white) to terminal 1 and the braid to terminal 4 (not earth ground).

Note: RTD's are not required if monitoring current/ground-faults only or if RTD's are connected via MONI-RMM2s.

Relay Output Connections to Contactors or Solid State Devices (TB7)

This connector switches voltage to the contactor coils or solid state relays. The pilot relay will switch the supply voltage (up to 277 Vac) to the contactor coil (using an NGC-30-CRM) or 12 Vdc to the solid state device (using an NGC-30-CRMS).

Refer to system layout diagram for detail wiring.

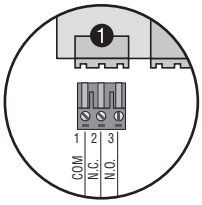


Common Alarm

The common alarm terminal block (TB12) provides a SPDT dry contact, rated at 277 Vac max (3A).

The NO (normal open) contact is open during normal conditions and will close upon an alarm condition.

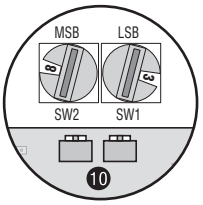
The NC (normal closed) contact is closed during normal conditions and will open upon an alarm condition.



Address Switches (SW1 & SW2)

Each NGC-30-CRM/-CRMS must have a unique communication address selected. The valid address switch range when using the NGC-UIT is 1-99. SW1 is the ones digit (0–9) and SW2 is the tens digit (0 or 9).

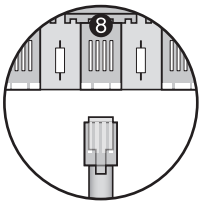
Note: When adding an NGC-30-CRM/-CRMS to the system, you must perform a network update at the NGC-UIT.

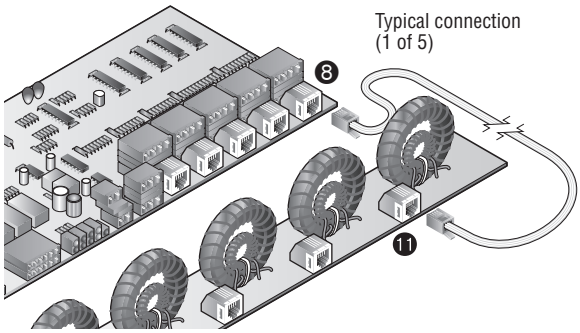


Ground-Fault/Line Current Sensors

Connections from NGC-30-CRM/-CRMS to NGC-30-CTM.

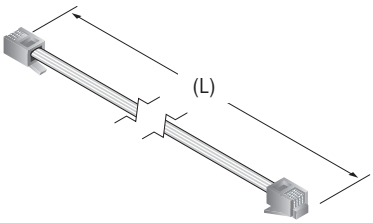
Using an RJ11 connector/cable assembly, connect one end to an RJ11 input (TB13-TB17) and the other end to the appropriate NGC-30-CTM RJ11 connector.





Ground-Fault/Line Current Cable Assembly

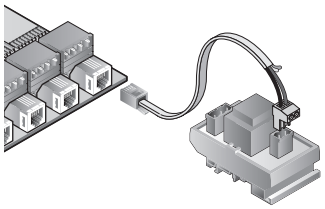
Notes: A complete cable may be ordered as part number: 20578010-XXX where XXX = Length (L) in inches.



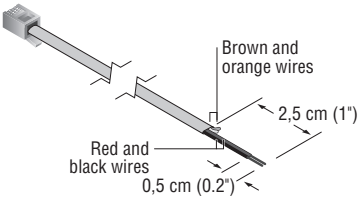
Optional Voltage Sensor

The optional voltage sensor can monitor 80 – 290 Vac. This voltage connects to one of the five line current/ground-fault inputs on the NGC-30-CRM.

Note: By using the optional voltage sensor, you lose the ability to monitor the ground-fault and current for that circuit.



Cable Preparation

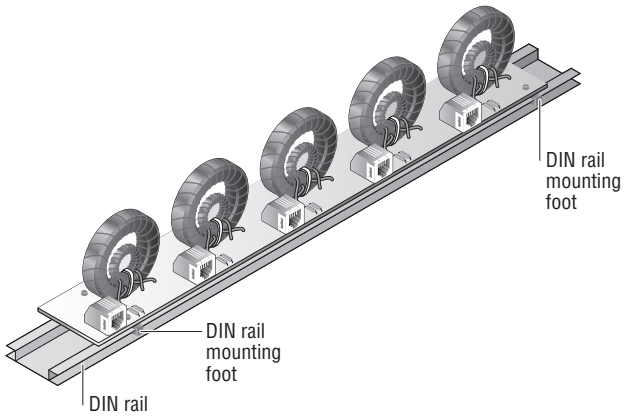


Notes:

1. Cut one end off of a ground-fault /line current cable.
2. Strip insulation approx. 2,5 cm from cut end.
3. Strip the red and black wire insulation approx. 0,5 cm.
4. Connect red and black wire to the two position terminal plug. No need to be concerned about polarity.
5. wTrim brown and orange wires from cut end.

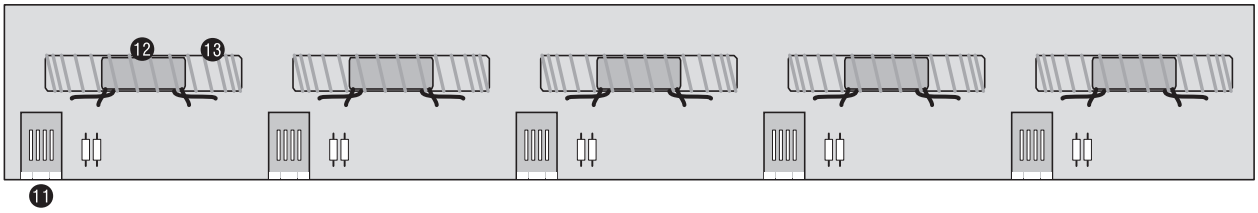
Mounting of NGC-30-CTM

Each NGC-30-CTM mounts on a DIN 35 rail. It should be located between the circuit breaker or terminal block and contactor or SSR in the panel.



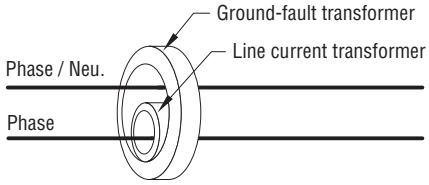
NGC-30-CTM Installation Instructions

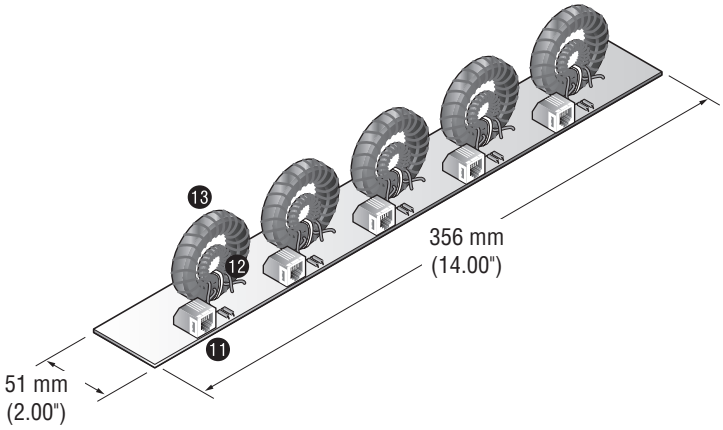
NGC-30-CTM



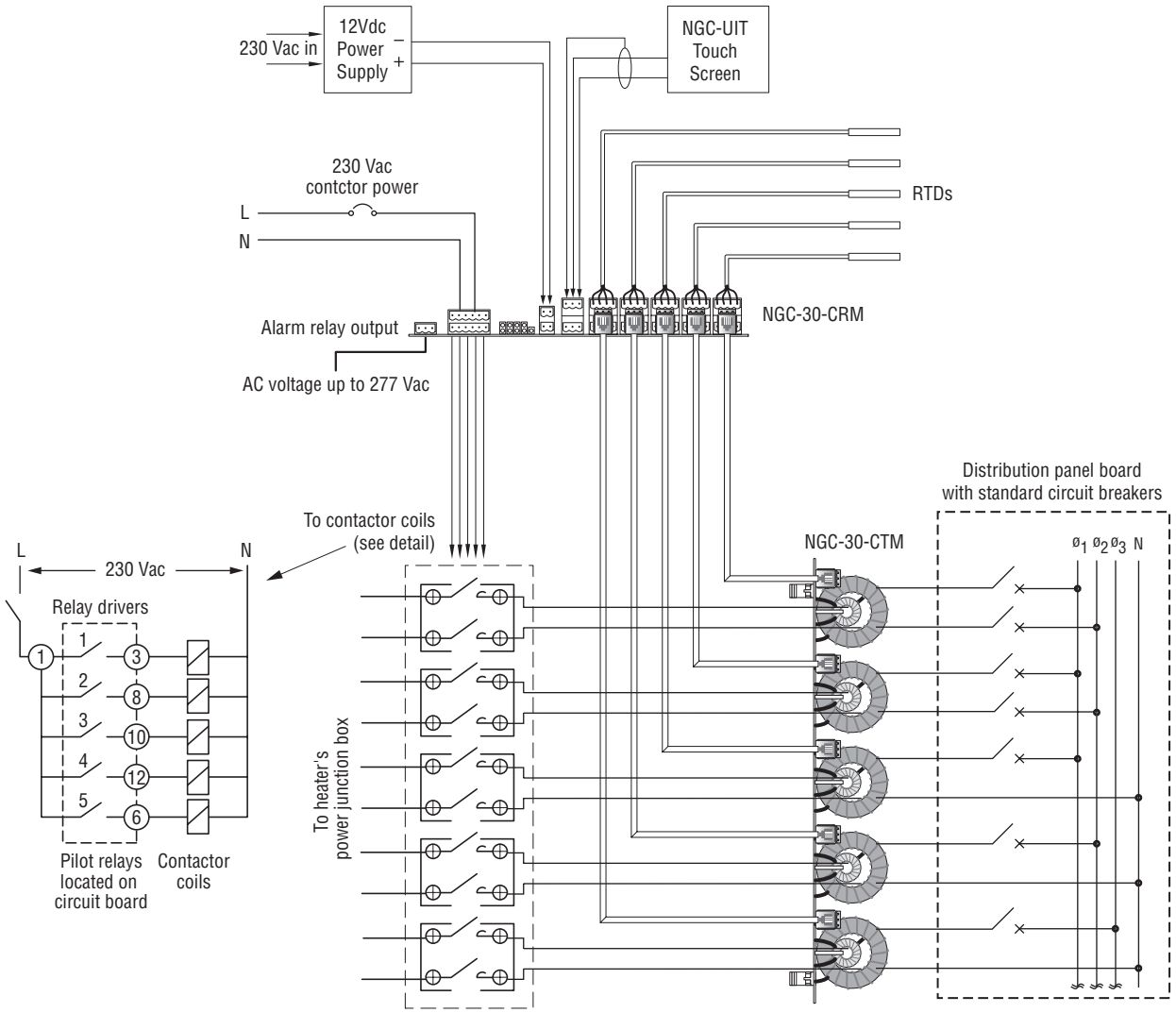
⓫ Line & ground-fault sensor outputs (5x)
⓬ Line current sensor (5x)
⓭ Ground-fault current sensor (5x)

Typical GF / LC wiring through transformers

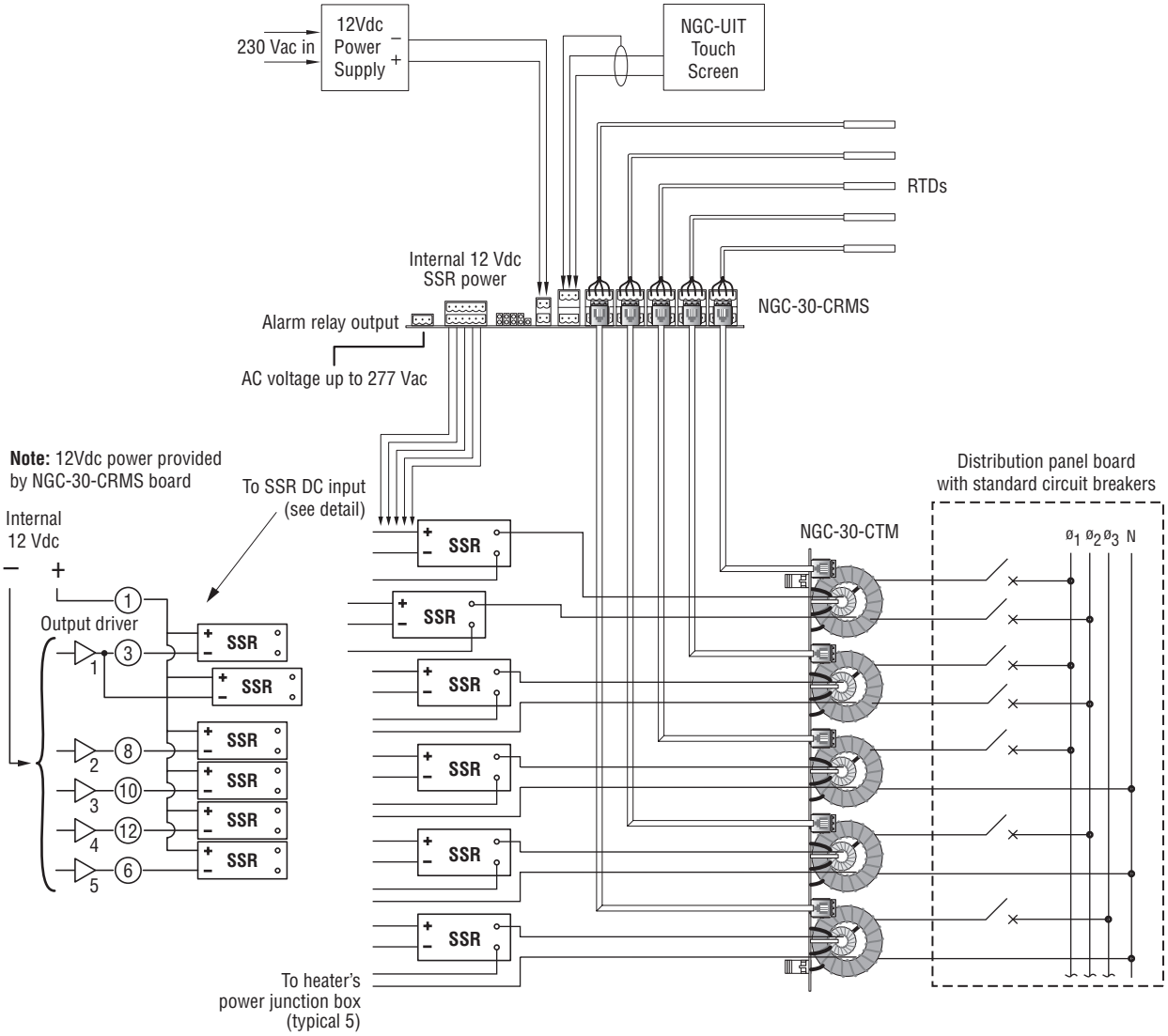


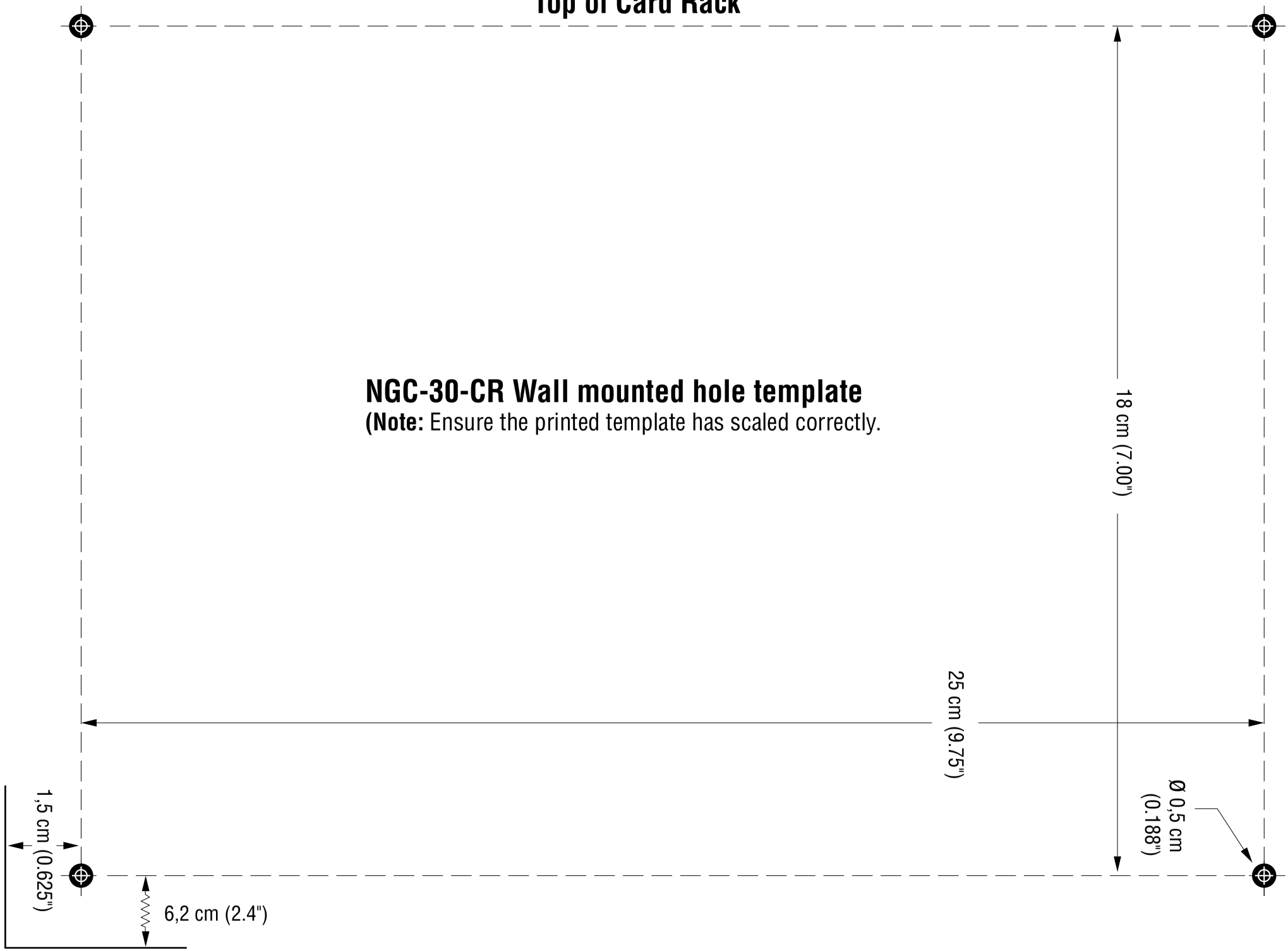


System Layout NGC-30-CRM



System Layout NGC-30-CRMS




Top of Card Rack
NGC-30-CR Wall mounted hole template
(Note: Ensure the printed template has scaled correctly.
18 cm (7.00")
25 cm (9.75")
Ø 0,5 cm
(0.188")
1,5 cm (0.625")
6,2 cm (2.4")

General Installation Instructions

1. The NGC-30 components must be installed:
   - In compliance with all local electrical and safety codes
   - In an enclosure suitable for the application environment. When used in hazardous (Class I, Div. 2 or Zone 2) locations, a minimum IP54 enclosure is required.
2. The NGC-30 components must be protected by external overcurrent and disconnect devices. This may be a circuit breaker or a combination of disconnect switch and fuses.

   The disconnect device:
   - Must disconnect all ungrounded, current-carrying conductors
   - Should be located in close proximity to the equipment
   - Be within easy reach of the Operator
   - Be marked as the disconnecting device for the equipment
3. Supply wiring insulation must be rated for the highest voltage and temperature to be encountered in the application. Conductors must be sized for the application and be protected by an external overcurrent device.
4. Some wiring configurations will use more than one power source and all must be de-energized prior to performing any maintenance on a controller circuit.
5. Protection provided by this equipment may be impaired if the device is used outside of its ratings or for applications other than is intended.
6. Always be sure that the intended location is classified as an area for which the product is approved.

Conducted And Radiated Emissions - Statement Of Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.

– Increase the separation between the equipment and receiver.

– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

– Consult the dealer or an experienced radio/TV technician for help.

This Class A digital apparatus complies with Canadian ICES-003.

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