

**Cordex Controller
Panel Mount/Rack Mount
125/220VDC**

018-570-B2

The following documents and drawings are included in this manual to provide the necessary information required for routine installation of the unit:

- **Specifications:** 018-570-B1 Rev A
- **CSA/NRTL Equivalence:** 048-554-10
- **Warranty Policy:** 048-507-10
- **Important Safety Instructions and Installation:** 018-570-C0 Rev A
- **Outline Drawings:** 018-570-06
- **Customer Connections:** 018-570-08
- **Factory Service Information:** 048-527-10

SPECIFICATIONS FOR ARGUS' CORDEX CONTROLLER PANEL/RACK MOUNT 125/220VDC

Basic Unit

Input Voltage:	90 to 300Vdc within rated limits
MTBF:	472,000 @ 25°C (77°F)
EMC:	The unit meets requirements of: ICES-003 Class A EN 55022 Class A (CISPR 22) EN 61000-4-2 ESD EN 61000-4-3 Radiated Immunity EN 61000-4-4 EFT /Burst EN 61000-4-6 Conducted Immunity FCC Part 15 Class A, FCC Part 68
Ground Fault Detection:	0 – 10mA

In accordance with FCC requirements, we provide the following statement as specified in the FCC guidelines for conformance to Part 15, Class A:

NOTE: *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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

Any changes or modifications to this equipment not expressly described in this manual could void the FCC compliance.

Environmental

Operating Temperature:	0 to 65°C standard @ 3000m derate to 55°C @ 4000m (32 to 149°F derate to 131°F @ 13124ft) [Optional -40°C]
Storage Temperature:	-20 to 70°C standard (-4 to 158°F) -40 to 80°C optional (-40 to 176°F)
Humidity:	0 to 95% non-condensing
Elevation:	-500 to +4000m (-1640 to 13124 ft)

Hardware Specifications

CPU:	Coldfire
RAM:	8MB
Flash:	4MB standard, 4MB optional
Display:	160 x 160 pixel grayscale LCD
Front Panel Controls:	Reset button and touch panel (display and input device)
LED's:	System OK (Green) Power System Minor Alarm (Yellow) Power System Major Alarm / Controller Fail (Red)
Internal Battery:	3V Lithium CR1616 [Argus part number #185-005-10]
Audio:	Built-in speaker for alarm and popup message tones
Mounting:	Integrated with power system/distribution panel [List 80] 19" and 23" flush rack mounting, 3RU [Default List 81]
Rack Mount Dimensions:	131mm H x 425mm W x 100mm D (5.1" x H x 16.7" W x 3.9" D)
Weight:	6.2 kg typical [Default List 81] (13.8 lb.)
Analog Inputs:	1 DC voltage, 1 DC current, 2 temperature, 4 bi-voltage [sample configuration – other options available]
Ground Fault Detect Alarms:	1
Digital Inputs:	4
Relay Outputs:	8 Form C, 220VDC 0.4A maximum; 8 optional Form C, 60VDC 1A maximum
Communication Ports:	Ethernet Port, 2 x CAN (bus), RS-485, 2 x RS-232

Recommended Connection Wire Sizes (as per UL/CSA)

Minimum Wire Size:	0.823 to 0.0507mm ² (#18 to #30 AWG)
Temperature Range:	0 to 50°C (32 to 122°F)

CAUTION – TO REDUCE RISK OF FIRE, USE ONLY 0.129mm² (#26 AWG) OR LARGER WIRE.

Part Numbers and List Options

This product is available to order under the following part numbers and list options:

Description	Part Number/List Option
Cordex Controller	018-570-20
Basic unit.....	*List 0
125V system software configuration	List 3
220V system software configuration	*List 4
19" rack, flush mounting brackets	*List 21
Door mounting brackets	List 22
23" rack, flush mounting brackets	List 25
Standard temperature (0 to 65°C).....	List 40
Extended temperature (-40 to 65°C).....	List 42
Gray finish with blue silkscreen.....	List 50
Charcoal finish with white (contrasting) silkscreen	List 56
Temp sensor assembly:	
1/4" lug, 6' cable	List 71
1/4" lug, 12' cable	List 72
1/4" lug, 24' cable	List 73
3/8" lug, 6' cable	List 74
3/8" lug, 12' cable	List 75
3/8" lug, 24' cable	List 76
3/8" lug, 50' cable	List 77
1/4" lug, 50' cable.....	List 78
CAN bus port (required for Cordex rectifier communications interface)	List 90
Auxiliary CAN bus port	List 91
RS-485 port (required for Pathfinder rectifier communications interface)	List 92
Ethernet port	List 93
Expansion board, communication (Lists 90-93 must be ordered separately).....	List 95
Expansion board, output relay, 8 x 1A Form C, internal	List 96
Internal modem, global (includes List 95)	List 101
Expanded Flash memory	List 110
Analog input configuration: add one current shunt input	List 128
* Default options	
Cable, 9-pin null modem	877-162-20
Cable, RJ-12 to RJ-12; sorted by length:	
1'	877-176-26
1.5'	877-176-21
19"	877-176-27
2'	877-176-22
6'	877-176-23
12'	877-176-24
25'	877-176-25

The above information is valid at the time of publication. Consult factory for up-to-date ordering information. Specifications are subject to change without notice.

CSA/NRTL — MARKS — BACKGROUND

What are the CSA and NRTL?

CSA (Canadian Standards Association also known as CSA International) was established in 1919 as an independent testing laboratory in Canada. CSA received its recognition as an NRTL (Nationally Recognized Testing Laboratory) in 1992 from OSHA (Occupational Safety and Health Administration) in the United States of America (Docket No. NRTL-2-92). This was expanded and renewed in 1997, 1999, and 2001. The specific notifications were posted on OSHA's official website as follows:

- Federal Register #: 59:40602 - 40609 [08/09/1994]
- Federal Register #: 64:60240 - 60241 [11/04/1999]
- Federal Register #: 66:35271 - 35278 [07/03/2001]

When these marks appear with the indicator "C and US" or "NRTL/C" it means that the product is certified for both the US and Canadian markets, to the applicable US and Canadian standards. (1)

Argus rectifier and power system products, bearing the aforementioned CSA marks, are certified to CSA C22.2 No. 950 and UL 1950, or CSA/UL 60950.

As part of the reciprocal, US/Canada agreement regarding testing laboratories, the Standards Council of Canada (Canada's national accreditation body) granted Underwriters Laboratories (UL) authority to certify products for sale in Canada. (2)

Only Underwriters Laboratories may grant a licence for the use of this mark, which indicates compliance with both Canadian and US requirements. (3)

What are NRTLs and what do they do?

NRTLs are third party organizations recognized by OSHA, US Department of Labor, under the NRTL program.

The testing and certifications are based on product safety standards developed by US based standards developing organizations and are often issued by the American National Standards Institute (ANSI). (4)

The NRTL determines that a product meets the requirements of an appropriate consensus-based product safety standard either by successfully testing the product itself, or by verifying that a contract laboratory has done so, and the NRTL certifies that the product meets the requirements of the product safety standard. (4)

When was the NRTL started and who governs it?

In 1983, in a suit brought on by an independent testing laboratory, OSHA was court ordered to remove specific references to UL (Underwriters Laboratories) and FMRC (Factory Mutual Research Corporation) from its regulations.

In 1988, OSHA revised its regulations to remove those references and the NRTL program was established.

The NRTL Program is both national and international in scope with foreign labs permitted.

References:

Information in this document has been developed from the official websites of the respective organizations.

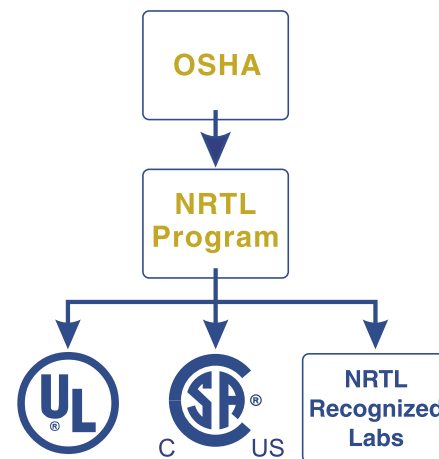
- (1) www.csa-international.org
- (2) www.scc.ca
- (3) www.ulc.ca
- (4) www.osha.gov



The product on which either of these marks appear has been certified by CSA as meeting applicable Canada/US standards.



The product on which this mark appears has been certified by UL as meeting applicable Canada/US standards.



WARRANTY AND REPAIR INFORMATION

Warranty Policy

Argus Technologies Ltd. warrants all equipment manufactured by it to be free from defects in parts and labor, excluding third party materials (example: batteries), for a period of two years; starting from the date of shipment from factory. The liability of Argus applies solely to repairing, replacing or issuing credit (at Argus' sole discretion) for any equipment manufactured by it and returned by the customer during the warranty period. The terms of the warranty are Ex Works (EXW) from Argus' factory service location.

Argus reserves the right to void the warranty if:

- (1) identification marks or serial numbers are removed or altered in any way,
- (2) invoice is unpaid, or
- (3) defect is the result of misuse, neglect, improper installation, environmental conditions, non-authorized repair, alteration or accident.

Argus shall not be liable to the customer or other parties for any loss of profits, loss of use, costs for removal or installation of defective equipment, damages or consequential damages based upon equipment failure during or after the warranty period. There shall be no other obligations either expressed or implied. Argus will not honor warranties for batteries and other third party products without prior written Argus authorization.

Freight Policy

Customer is responsible for all shipping and handling charges (COD and freight collect will not be accepted without prior approval from Argus Technologies).

Terms of Payment (North America)

Payment terms are net 30 days subject to prior credit approval. All other orders require payment before shipping.

Terms of Payment (International)

Payment terms are subject to prior approval and are typically through Tele-Transfer.

Return Material Policy

Our RMA policy is designed to ensure prompt, efficient and high quality factory service. A Return Material Authorization (RMA) number must be obtained before products can be accepted for servicing by the Argus factory. For returns to an authorized service center (refer to "Authorized Service Centers" for locations), please consult the individual service center for specific return policies and instructions.

To obtain a RMA number for a factory return, customers must call the appropriate location with the product serial and model number, as well as a brief description of the problem, shipment instructions and billing details.

The original packing container should be used whenever possible. Both the shipping documents and the outside of the box must have the RMA # clearly marked and the product shipped prepaid to the Argus factory service center. Argus will endeavor to repair products within five working days of receipt. Repairs to the returned product are warranted for a period of six months. A service charge may be applied if no fault is found in the returned product. Argus will not accept products without an RMA number.

Business Hours

Argus North American office hours are 7:30 am to 5:00 pm (Pacific Standard Time) Monday to Friday.

Factory Service Centers

Canada and International

Argus Technologies Ltd.
5700 Sidley Street
Burnaby, BC, V5J 5E5 Canada
Tel: 604-436-5900
Fax: 604-436-1233
Email: support@argus.ca

USA

Argus Technologies Inc.
ATTN: RMA Returns
3116 Mercer Avenue
Bellingham, WA, 98225 USA
Tel: 604-436-5900
Fax: 604-436-1233
Email: support@argus.ca

South America

Argus Technologies Argentina
Santo Tome 2573, Capital Federal
Buenos Aires, 1416 Argentina
Tel: 54-11-4504-4698
Cell: 54-9-11-4993-9996
E-pager: 541149939996@nextel.net.ar

Central America

Argus First
Anatole France No. 17
Col. Polanco
Mexico City, 11560 Mexico
Tel: 52-55-5280-6990
Fax: 52-55-5280-6585

Europe

Alpha Technologies Europe Ltd.
Cartel Business Estate
Edinburgh Way
Harlow, Essex, CM20 2DU UK
Tel: 44-1279-422110
Fax: 44-1279-423355

Asia-Pacific

Com10 International
Unit R5, 391 Park Road
Regents Park Estate
Regents Park, NSW, 2143 Australia
Tel: 61-2-9722-3310
Email: support@com10.com.au

PCM Electronics (Dong Guan) Co., Ltd.
ZhenAn Hi-Tech Industrial Park
ZhenAn Road, ChangAn Town
DongGuan City, GuangDong, 523875 China
Tel: 86-769-533-2600
Fax: 86-769-532-6603

Africa-Middle East

Com10 International
Unit R5, 391 Park Road
Regents Park Estate
Regents Park, NSW, 2143 Australia
Tel: 61-2-9722-3310
Email: support@com10.com.au

Authorized Service Center

Canada

Compower Systems Limited
118 Tiffield Road
Toronto, ON, M1V 5N2 Canada
Tel: 416-293-3088
Fax: 416-293-0671

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

1. Please read this manual prior to use to become familiar with the product's numerous features and operating procedures. To obtain a maximum degree of safety, follow the sequences as outlined.
2. This manual provides warnings and special notes for the user:
 - a. Points that are vital to the proper operation of the product or the safety of the operator are indicated by the heading: **WARNING**.
 - b. A notation that is in ***Bold Italic*** typeface covers points that are important to the performance or ease of use of the product.
3. Before using the product, read all instructions and cautionary markings on the product and any equipment connected to the product.
4. Do not expose the product to rain or snow; install only in a clean, dry environment.
5. **CAUTION** – Unless otherwise noted, use of an attachment not recommended or sold by the product manufacturer may result in a risk of fire, electric shock, or injury to persons.
6. **CAUTION** – Do not operate the product if it has received a sharp blow, it has been dropped, or otherwise damaged in any way – return it to a qualified service center for repair.
7. **CAUTION** – Do not disassemble the product – call our qualified service centers for servicing. Incorrect reassembling may result in a risk of electrical shock or fire.
8. **WARNING** – High voltage hazard. Extreme caution should be maintained when servicing or touching conductive components connected to the product.

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1 Introduction

1.1 Scope of the Manual

This instruction manual explains the installation and interconnection of the Cordex System Controller (CXC) 125/220VDC panel (CXCP) and rack (CXCR) models from Argus Technologies.

NOTE: *To aid the user with installation, frequent reference is made to drawings located at the rear of this manual.*

1.2 Product Overview

The CXC 125/220VDC is an advanced system controller designed by Argus for operation with 125/220VDC power systems.

The CXCP and CXCR models each provide four digital and nine analog inputs that may be used to monitor a wide range of power system components.

The CXCP and CXCR models allow the user to configure, monitor and control the entire DC power system from a touch screen display similar to that used in a Personal Digital Assistant (PDA). Other features include temperature compensation, auto equalization, remote access, dial out on alarm, battery diagnostics, as well as Web server and SNMP support for configuration and monitoring.

NOTE: *Separate documentation will be provided detailing the CXC software features, setup and operation.*

The CXC offers additional advanced features via add-on “list options.” The customer should include these list options at the time of ordering.

1.3 Part Numbers and List Options

Refer to the specifications section at the front of this manual for part numbers and ordering options.



Figure 1—Front view of Cordex controller 19” rack model CXCR

2 Hardware Features

Behind the CXC's front panel lies the main controller motherboard, which contains a microprocessor, memory, removable lithium battery, as well as numerous other electronic components. The input/output (I/O) board houses a series of terminal connections. Space is also available to add optional output relays or an internal modem. Connections are oriented for front access.

2.1 Operator Interface Devices

The user interfaces with the CXC by one or more of the following methods:

- Graphical input device, front panel LEDs and audio speaker.
- RS-232 serial port (local "craft" port w/ null modem cable).
- Optional Ethernet connection.

2.1.1 Basic Audio Speaker

A built-in audio speaker confirms activity with short tones; that is, for successful selection of an item or selecting outside the bounds of a window prompt. The speaker also sounds an intermittent tone during active alarms.

2.1.2 Front Panel Descriptions

The front panel contains a touch screen, a local RS-232 serial (Craft) port, a reset button and LEDs. A brief description of each is provided below:

2.1.3 Touch Screen

Located on the front panel is a 160 x 160-pixel graphical LCD with touch screen similar to those used in PDAs. This graphical user interface (GUI) allows the operator to interact with screen selectable items using a fingertip.

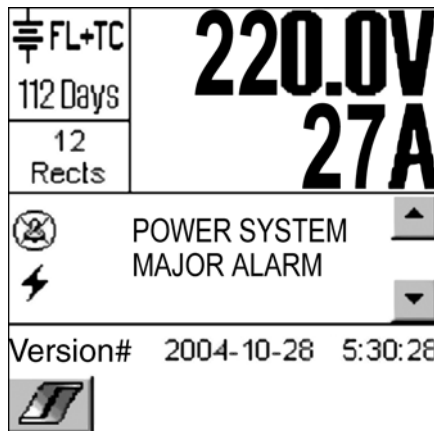


Figure 2–Sample screen of CXC graphical user interface

2.1.4 RS-232 Serial (Craft) Port

Local access to the CXC is possible through a front panel RS-232 serial port; using a null modem cable. The communication protocol supports a web interface (via Microsoft® Internet Explorer 5.5 or greater). The remote screen display is an enhanced version of the CXC's front panel display.

2.1.5 Reset Button

A reset button is located on the front panel for restarting the CXC's microprocessor. It takes approximately 15 seconds before the display reappears after pressing the reset button.

NOTE: Refer also to the software manual – always select the shutdown menu item before pressing the reset button.

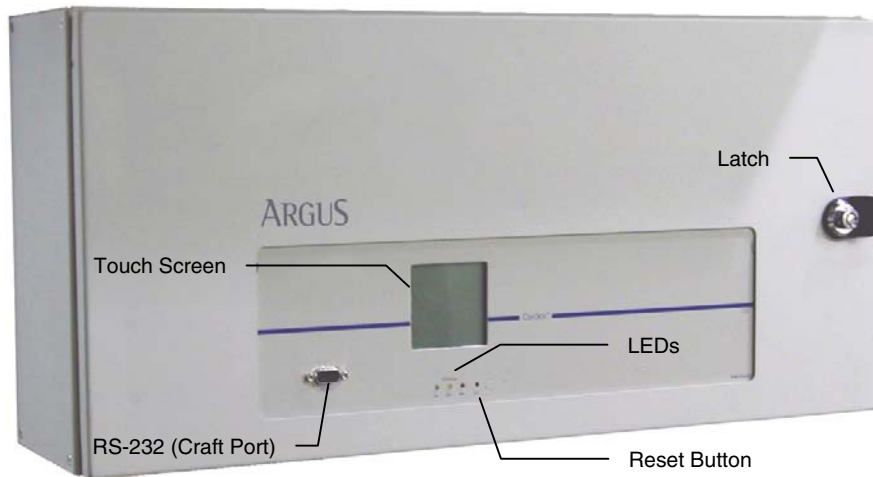


Figure 3—Front view of Cordex controller panel model CXCP

2.1.6 Front Panel LEDs

The CXC has three LEDs located on the front panel. These are used to display the alarm status of the power system, CXC progress and status during startup, file transfers and lamp tests.

2.1.6.1 Alarm Conditions

The CXC illuminates the LED that corresponds to the system alarm status. The following show the corresponding alarm status for each LED color:

- Green – No alarms present
- Yellow – Minor alarm is present (no major alarms)
- Red – Major alarm is present.

Only one LED is illuminated at a time during alarm conditions.

2.1.6.2 Progress and Status Indication

The LEDs are also used in the following situations:

- Base unit validation – all three LEDs are on at the same time.
- File transfer – when recovering from invalid firmware application – the red LED is illuminated.
- Lamp Test – all three LEDs flash on and off at the same time for 2 seconds.

2.2 Serial Ports

2.2.1 CAN (Option)

Two CAN Serial ports, for communications with Argus' Cordex rectifiers and other CAN-enabled equipment, are located next to the RS-485 port on the CXC.

2.2.2 Ethernet (Option)

One 10/100 Base T Ethernet port is provided for CXC communications with a local area network (LAN), e.g. the Internet.

2.3 Real Time Clock

The CXC contains a real time clock (Y2K compliant), which allows time stamps to be placed on alarm, and statistical events contained in the historical data files.

2.4 Lithium Battery Backup

A removable lithium battery (see Specifications) is included in the system to retain time and date settings upon power loss or reset.

2.5 Analog Input Channels

The CXCP and CXCR each have up to nine analog channels, including up to five voltage inputs, two current inputs, and two temperature inputs.

2.5.1 Voltage Inputs

Voltage-input channel V2 provides monitoring of the charge (battery) voltage. The CXC software is pre-configured to monitor V2 for battery voltage. V2 is used as the system reference for rectifier float voltage, low voltage disconnect (LVD), system high voltage alarm, and system low voltage alarm.

2.5.2 Ground Fault Detect (GFD)

V2 is also used for GFD (internally connected circuit). Ground fault is detected when either terminal of V2 (system voltage that is normally connected to the battery string) shorts to earth ground either directly or through some conductive means. The GFD circuit will detect a fault current range of $\pm 10\text{mA}$. The resolution is 1mA.

The GFD will trip an alarm if the fault current exceeds the user configurable Trip Value under Configuration menu of Alarms/Configure Alarms/Miscellaneous Alarms/GFD. The default setting is $\pm 5\text{mA}$.

As with any analog input, the GFD can also be calibrated as required. See Analog Calibration menu in the CXC software manual.

2.5.3 Current Inputs

Up to two current-input channels (I1 and I2) provide monitoring of current; e.g., discharge (load) and charge (battery). The CXC software is pre-configured to monitor I1 for load current using an external DC current transformer. The second optional current input is factory configured to monitor an external 50mV current shunt.

2.5.4 Temperature Inputs

Two dedicated temperature probe inputs (T1 and T2) provide monitoring of battery temperature or room/ambient temperature. They may also be used for temperature compensation (temp comp). A voltage is supplied to these terminals to power the temperature sensors.

2.5.5 General-Purpose Inputs

The general-purpose (GP) input channels monitor various analog signals depending on how the channels are configured. The configuration determines whether the signals allowed are to be bipolar (may vary in either polarity from zero, e.g. $\pm 150\text{VDC}$), unipolar (may vary positive from zero, e.g. 0 to $+300\text{VDC}$), or temperature.

All four GP inputs are factory configured as unipolar voltage inputs.

2.6 Digital Input Channels

The CXC can accommodate up to four digital input channels.

NOTE: *Each channel may be set by closing (shorting) or opening the inputs with a voltage free contact to achieve the appropriate condition. This differs from the digital inputs on other Cordex controllers which require a zero or system voltage potential at the input to activate or deactivate the appropriate condition.*

These channels can monitor digital alarm/control signals from rectifiers, converters and many other types of equipment. Some of these channels are pre-assigned to monitor specific signals. *See the Software manual for more information.*

2.7 Alarm and Control Output Relays

Each CXCP or CXCR contains eight standard and eight optional Form C alarm output relays to extend alarms and control external apparatus. Each internally generated alarm or control signal may be mapped to any one of the 16 relays, or, several signals may be mapped to just one relay or none at all.

2.8 CXC System Fail Alarm/Relay

The CXC system fail alarm activates because of a major internal failure. During such a condition, the unit will attempt to reset, but if this fails, an alarm condition will be extended to a relay and the red LED on the front panel will illuminate. This is a fail-safe signal to the remote monitoring equipment; i.e. alarm will be extended even if power to the unit is interrupted.

3 Inspection

3.1 Packing Materials

All Argus products are shipped in rugged, double walled boxes and suspended via solid inserts to minimize shock that may occur during transportation. Packaging assemblies and methods are tested to National Safe Transit Association standards.

Products are also packaged with Cortex. This plastic wrap contains a corrosive-inhibitor that protects the product from corrosion for up to two years.

3.1.1 Returns for Service

Save the original shipping container. If the product needs to be returned for service, it should be packaged in its original shipping container. If the original container is unavailable, make sure the product is packed with at least three inches of shock-absorbing material to prevent shipping damage.

NOTE: *Argus Technologies is not responsible for damage caused by the improper packaging of returned products.*

3.2 Check for Damage

Prior to unpacking the product, note any damage to the shipping container. Unpack the product and inspect the exterior for damage. If any damage is observed contact the carrier immediately.

Continue the inspection for any internal damage. In the unlikely event of internal damage, please inform the carrier and contact Argus Technologies for advice on the impact of any damage.



Verify that you have all the necessary parts per your order for proper assembly.

4 Installation

This chapter is provided for qualified personnel to install the product, which shall be mounted in a clean and dry environment.

NOTE: *To aid the user with installation, frequent reference is made to foldout drawings located at the rear of the manual.*

4.1 Safety Precautions



WARNING

Hazardous voltages are present at both the input and the output of power systems. The DC output from the rectifiers and the battery system is at a lethal potential and has a high short circuit current capacity that may cause electrocution, severe burns and electrical arcing.

Before working with any live battery or power system/distribution center, the following precautions should be followed:

- Remove all metallic jewelry; e.g., watches, rings, metal rimmed glasses, necklaces.
- Wear safety glasses with side shields (and prescription lenses if necessary) at all times during installation.

Insulated metallic tools shall be used.

The installer should follow all applicable local rules and regulations for electrical and battery installations; e.g., CSA, UL, CEC, NEC, OSHA, and local fire codes.

4.2 Shelf Preparation/Mounting

NOTE: *The CXC must be mounted in a clean and dry environment.*

4.2.1 Panel Mount

The CXCP panel mount or “door” version mounts inside an Argus integrated distribution center. The preparation and mounting are done at the factory.

4.2.2 Rack Mount

The CXCR rack mount model fits horizontally in a 19” or 23” rack. The CXCR should be mounted to the rack using two #12 – 24 x 1/2” screws in each bracket. Philips-type screws and screwdriver should be used to eliminate the possibility of slippage and scratching of the unit’s exterior. Washers (such as internal tooth) or special screws that are designed to cut through the painted surface should be used to ensure a good chassis ground.

Consult the drawings located at the rear of this manual and proceed to the next section for wiring connections.

5 Wiring and Connections

This chapter provides cabling details and notes on cable sizing for DC applications with respect to the product.

NOTE: *Refer also to foldout drawings located at the rear of the manual.*

5.1 Safety Precautions



WARNING

Hazardous voltages are present at both the input and the output of power systems. Ensure that input power and output power is removed before attempting work on the CXC's connections. Use a voltmeter to verify the absence of voltage. Clearly mark the correct polarity of the battery leads before commencing work on DC connections.

Refer to the previous (Installation) chapter for additional safety precautions.

5.2 Front Access

All wiring connections are accessible from the front of the panel and rack models. For example, to gain access to the terminal block connectors for the rack model:

1. Turn the two front panel latches (spring-loaded) counter-clockwise.
2. Tilt the front panel forward and down.
3. Loosen the CXC's rear screws and remove its rear plate.

Terminal blocks can accommodate wire sizes per the specifications section near the front of this manual. All cables should be routed through the access holes, bundled together with clips and clamped directly into applicable terminal blocks.

NOTE: *Connections to the CXC should comply with all local electrical codes and ordinances.*

5.3 Tools Required

Various insulated tools are essential for product installation. Use this list as a guide:

- Slot head screwdrivers (blade sizes: 1/4", 1/8", 1/16")
- Philips head screwdriver, #2 (tip size 3/16")
- Digital voltmeter equipped with test leads
- Adjustable 125/220VDC load (optional)
- Anti-static wrist strap
- Computer (laptop) with Microsoft® Internet Explorer 6 or greater
- Crossover cable RJ-45 (for access using the Ethernet port)
- Null modem cable (for access using the RS-232 port)
- Cutters and wire strippers.

5.4 Power System Chassis Ground and DC Ground Reference



WARNING

For safety reasons, ensure the system is properly bonded to the building's ground grid. 125/220VDC systems are typically floating; i.e., not connected to earth ground.

Connect the CXC chassis ground to the site ground to ensure correct operation of the CXC and to prevent drifting floating analog (especially current) readings. The Ground Fault Detect circuit will not function properly if the CXC chassis is not connected to the site ground.

5.5 Power Inputs

The system can operate from 125/220VDC input with no configuration required.

NOTE: *The CXC cannot function without DC power to the motherboard.*

Power must be connected as follows:

1. Connect system (+) power bus lead to (+) terminals 56 (primary input) and/or 54 (secondary input).
2. Connect system (-) power bus lead to (-) terminals 57 (primary input) and/or 55 (secondary input).

5.6 Analog Inputs



WARNING

Ensure the correct polarity is used for all input cable terminations.

The analog input channels are used to monitor various types of electrical signals. Some of the analog channels are reserved for specific signals, while others are designated as general-purpose inputs, which accommodate various types of analog signals.

Bundle the input cables together and route through the entry holes.

NOTE: *Default configurations and terminal numbers described below have been summarized in Table A (next page). Refer also to foldout drawings located at the rear of this manual. Custom configurations may be detailed within the Argus power system documentation package.*

5.6.1 Voltage Input 2 (V2)

CAUTION

If the V2 sense leads are disconnected from the CXC, the following will occur:

- The CXC registers the absence of DC as an invalid condition.
- The LVD will not be de-activated.
- The rectifier voltage may increase slightly, typically 1.8V (5.5V maximum).

5.6.2 Midpoint Monitoring (connection example)

An analog signal configured (at the factory) for voltage can be used for mid-point monitoring. Channel V1 is used in the example below but any of the available voltage channels can be used.

NOTE: *See CXC Software manual for detailed instruction on programming.*

Connect as shown ensuring correct polarity:

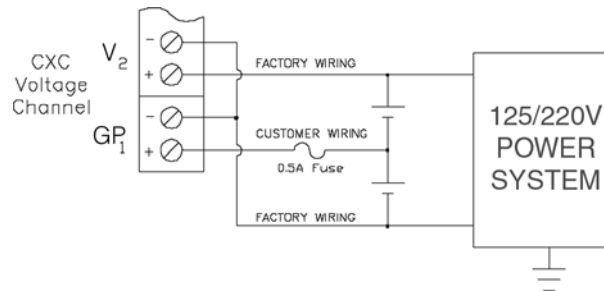


Figure 4—Connection example for mid-point monitoring

5.7 Digital Inputs

The digital input channels are used to monitor various alarm and control signals. Shorting an input with a voltage-free relay contact will activate the channel.

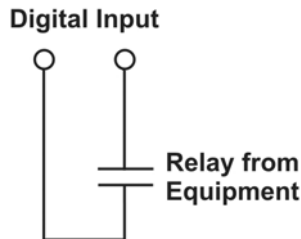


Figure 5—Showing connection method



CAUTION: to reduce risk of fire, use only 0.129mm² (#26 AWG) or larger wire.

Terminal	Description	Default Name	Signal	Range
1 and 2; V2	Voltage Input 2	Charge Voltage	Pos (+)/Neg (-)	0-300VDC
3 and 4; GP1*	General Input 1	GP1	Pos (+)/Neg (-)	0-300VDC
5 and 6; GP2*	General Input 2	GP2	Pos (+)/Neg (-)	0-300VDC
7 and 8; GP3*	General Input 3	GP3	Pos (+)/Neg (-)	0-300VDC
9 and 10; GP4*	General Input 4	GP4	Pos (+)/Neg (-)	0-300VDC
11 and 12; T1	Temp Input 1	T1	Pos (+)/Neg (-)	0-20VDC
13 and 14; T2	Temp Input 2	T2	Pos (+)/Neg (-)	0-20VDC
15 and 16; I2	Current Input 2	I2	Pos (+)/Neg (-)	0-20VDC
19 and 20; D1**	Digital Input 1	Distribution Fuse (Alarm)	N/A	Short or open
21 and 22; D2**	Digital Input 2	Distribution CB (Alarm)	N/A	Short or open
23 and 24; D3**	Digital Input 3	Battery CB (Alarm)	N/A	Short or open
25 and 26; D4**	Digital Input 4	Battery CB (Alarm)	N/A	Short or open
27, 28 and 29; K1***	Alarm Output 1	LVD1	NC/COM/NO	220VDC, 0.4A
30, 31 and 32; K2***	Alarm Output 2	LVD2	NC/COM/NO	220VDC, 0.4A
33, 34 and 35; K3***	Alarm Output 3	LVD3	NC/COM/NO	220VDC, 0.4A
36, 37 and 38; K4***	Alarm Output 4	System Minor	NC/COM/NO	220VDC, 0.4A
39, 40 and 41; K5***	Alarm Output 5	System Major	NC/COM/NO	220VDC, 0.4A
42, 43 and 44; K6***	Alarm Output 6	AC Mains Hi-Low	NC/COM/NO	220VDC, 0.4A
45, 46 and 47; K7***	Alarm Output 7	Not assigned	NC/COM/NO	220VDC, 0.4A
48, 49 and 50; K8***	Alarm Output 8	Not assigned	NC/COM/NO	220VDC, 0.4A
51, 52 and 53; K0****	Alarm Output 0	System Fail Output	NC/COM/NO	220VDC, 0.4A
54 and 55; B PWR	Secondary Power	Secondary Power	Pos (+)/Neg (-)	90-300VDC
56 and 57; A PWR	Power	Power	Pos (+)/Neg (-)	90-300VDC
DCCT input; P3	Current Input 1	I1	Pos (+)/Neg (-); Pwr (+)/Pwr (-)	±15VDC, 100mA max.

Table A—Wiring connections

- * Bipolar (Voltage Input) is ±150VDC, Unipolar Voltage (Input) is 0—300VDC, Temp Probe is 0—20VDC with power source.
- ** See Table B for definitions of impedance levels.
- *** Can be configured to de-energize on alarm (DOA) or energize on alarm (EOA).
- **** System Fail output relay is fail-safe and will de-energize during an alarm condition.

NOTE: DCCT power output is protected against short circuits and is able to power four DCCTs. To aid the user with installation, frequent reference is made to drawings located at the rear of this manual. Custom configurations may be detailed within the Argus power system documentation package.

5.7.1 Programming the Digital Input

The digital input channels (terminals 19 through 26) can be programmed for “active high” or “active low.” Active high indicates “alarm on the presence of a short circuit” and active low indicates “alarm on the removal of the short circuit.”

NOTE: See CXC Software manual for detailed instruction on programming.

Impedance Level (Ohms) Considered As “0” (Off)	Impedance Level (Ohms) Considered As “1” (On)
> 1M	< 1

Table B—Digital input impedance level definitions

5.8 Relay Outputs



WARNING

Relays are rated at 220VDC 0.4A. Exceeding these limits may damage the relay and other circuitry in the CXC.

Terminals 27 to 50 provide 8 Form C contacts (NO, COM and NC) for extending various alarm or control signals. Each relay output can be wired for NO and/or NC operation during an alarm or control condition. See Figure 6.

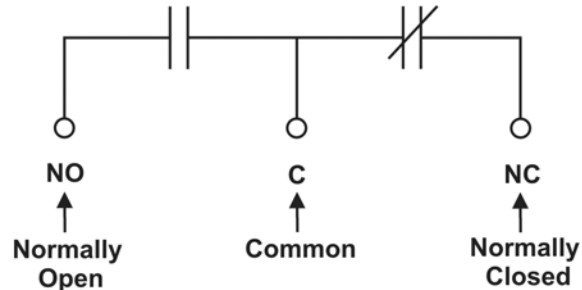


Figure 6—Showing relay connections in the de-energized state

Relays can be programmed to energize or de-energize during an alarm condition (see Software manual). When the CXC reset button is pressed or power is lost, all relays de-energize.

Relay contacts 1-8 are high capacity and intended to be used for controlling LVD contactors.

5.8.1 System Fail Relay

Terminals 51 to 53 provide connections for a system (supervisory) fail relay. This fail-safe relay (i.e. it is de-energized during an alarm condition) can be wired for NO or NC operation.

5.8.2 LVD Control

The LVD control functions can be hardwired directly from the assigned relay output pins to the LVD contactor panel. See Controls Menu Defaults in the Software manual.

5.8.3 CEMF Cell Control

The CEMF control function can be hardwired directly from the assigned channel in to the CEMF cell controller panel. See Controls Menu Defaults in the Software manual.

5.8.4 Optional Relays and Outputs

Eight relays and outputs may be added to the CXC (panel and rack models) with the purchase of an optional expansion board (see List Options at the front of this manual).

5.9 Rectifier Connections

5.9.1 CAN Out Serial Port

A single CAN Out serial port, for communications with Argus' Cordex rectifiers and other CAN-enabled equipment (nodes) on the same system, is located next to the rear Ethernet port.

Daisy-chain from node to node (CAN OUT of one node to CAN IN of another) as necessary and ensure that only the last node is terminated.

5.10 Network Connection and Remote Communications

The Cordex system can be set up, monitored and tested via ETHERNET 10/100 Base-T or with a RS-232 serial data connection, or over a phone line using a modem.

NOTE: *Pinouts are shown in the customer connections drawing.*

The communication protocol supports a web interface. The remote screen display is an enhanced version of the CXC's front panel display.

Some standard scenarios are described below:

5.10.1 Ethernet Port for Network Connection (Standard Network Cable)

The Ethernet port is designed for CXC connection to a user supplied network (TCP/IP secured by user) via a front panel RJ-45 jack. Connect to the Cordex controller using a standard network cable.

On the jack of the CXCP and CXCR only are two LEDs used to provide indication of status. The green LED illuminates when disconnected and flashes when there is activity on the line. The amber or yellow LED is off when disconnected and illuminates when a successful (data) connection is present.

5.10.2 Ethernet Port for Local Connection (Crossover Cable)

Local access (e.g. laptop computer) is also possible from the Ethernet port connection using a standard network crossover cable.

5.10.3 RS-232 Serial (Craft) Port for Local Connection (Null Modem Cable)

Local access to the CXC is possible through the front panel RS-232 serial port using a null modem cable. See Figure 7 below:

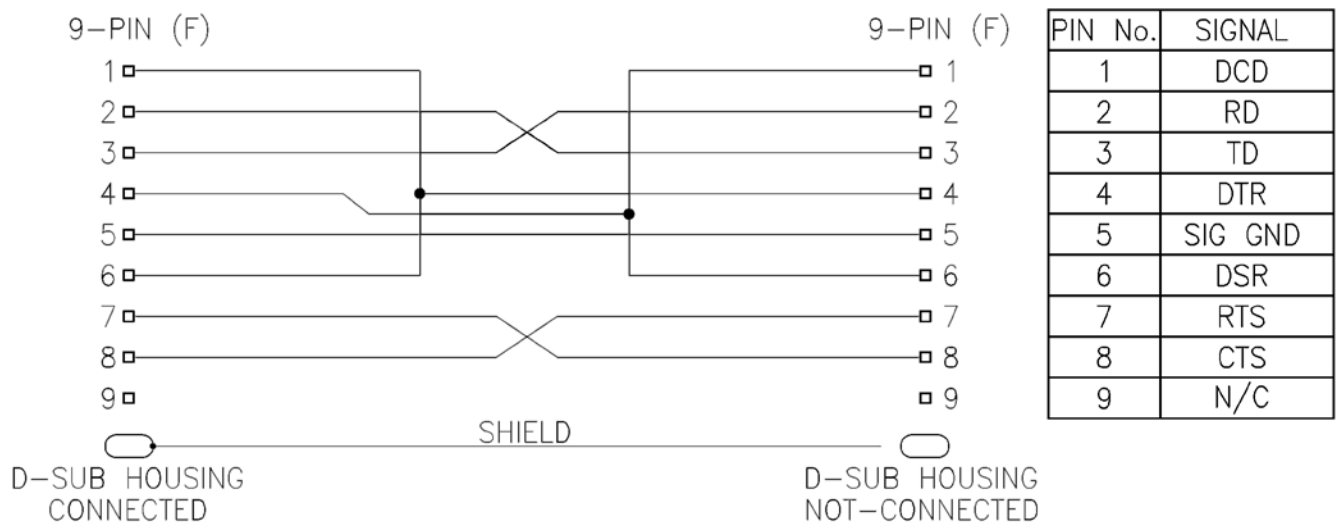


Figure 7–NULL modem pinouts

5.10.4 Communication Expansion Board (Modem Straight Through Cable)

The CXC may be equipped with a communication expansion board, which includes a rear RS-232 serial port to allow the use of an external modem. Connect the modem to the Cordex controller with a straight through cable.

See Figure 8 below for a rendering of CXC connections for power system communications:

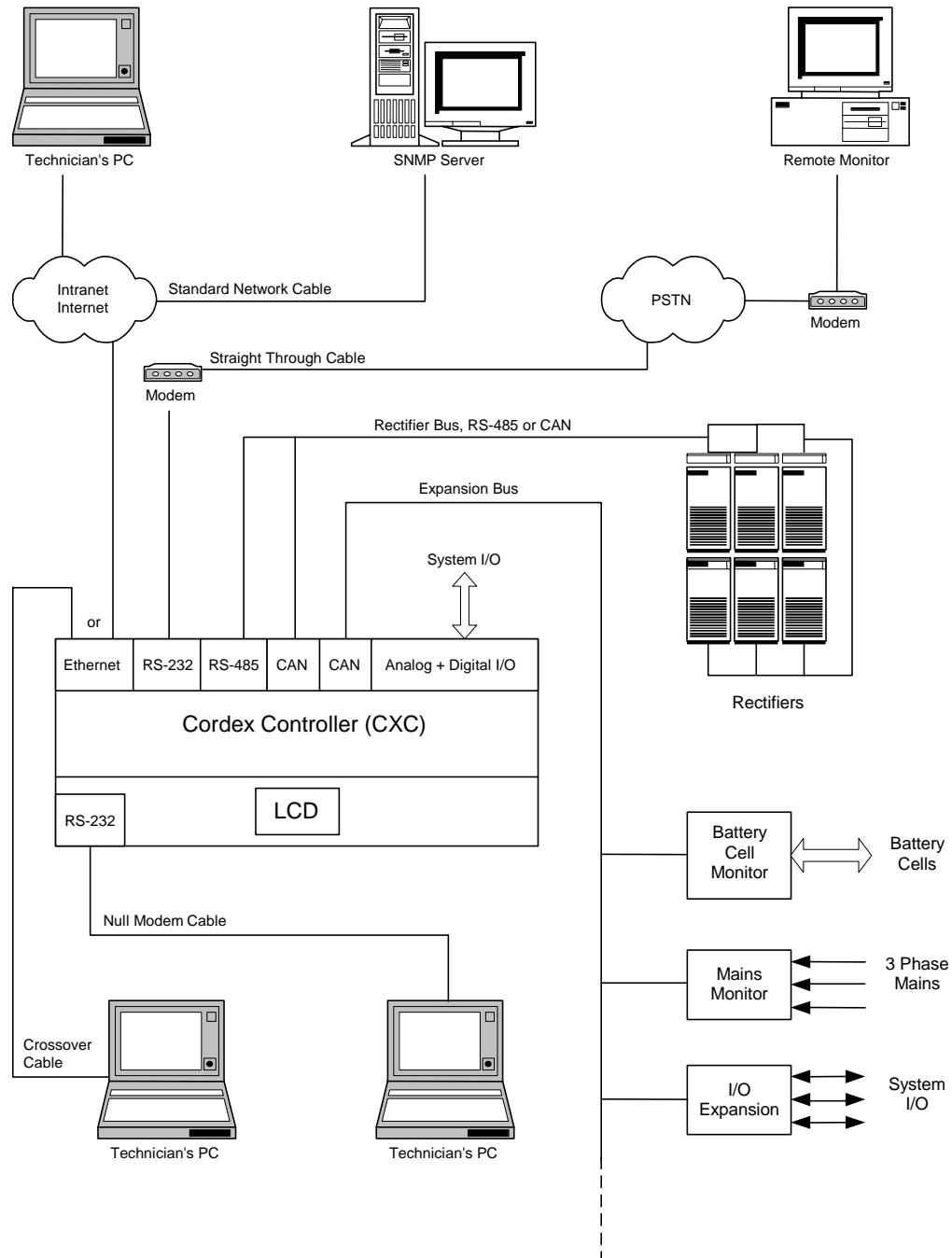


Figure 8—Communications connections

See also Remote Communications in the Software manual for more details on local and remote communications.

6 Maintenance

Although very little maintenance is required with Argus systems, routine checks and adjustments are recommended to ensure optimum system performance. Qualified service personnel should do repairs.

The following table lists a few maintenance procedures for this system. These procedures should be performed at least once a year.



WARNING: HIGH VOLTAGE AND SHOCK HAZARD.

Use extreme care when working inside the shelf while the system is energized. Do not make contact with live components or parts.

Circuit cards, including RAM chips, can be damaged by static electricity. Always wear a grounded wrist strap when handling or installing circuit cards.

Procedure	Date Completed
Clean ventilation openings	
Inspect all system connections (re-torque as necessary)	
Verify alarm/control settings	
Verify alarm relay operation	

Table C—Sample maintenance log

Refer to the specification section at the front of this manual for replacement parts.

6.1 Lithium Battery Replacement

A removable lithium battery is located near the back and to the right of the motherboard. The battery life is rated up to three years, but should be replaced if the panel does not maintain date and time during power interruption. It is also recommended to replace when the lithium battery voltage is less than 2.6VDC.



WARNING

Exercise extreme caution and do not touch any connected equipment.

To replace the lithium battery, shut down the CXC, remove the rear cover, and pull battery out carefully. Ensure that the new battery is the same as the one being replaced.

NOTE: *Replace the battery within 30 seconds to prevent loss of date and time.*

7 Argus Conventions

7.1 Numbering System

Argus Technologies uses an eight-digit drawing number system, which is broken into three blocks. The first three digits describe the category of the product; e.g., rectifier or fuse panel. The next three digits indicate the sequence in which the product number was allocated in a particular category. The last two digits indicate the type of drawing, for example:

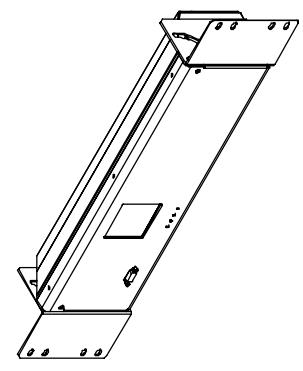
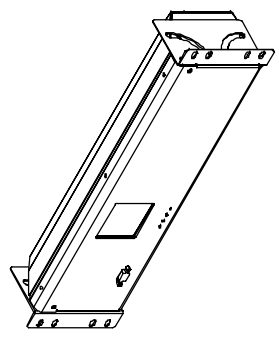
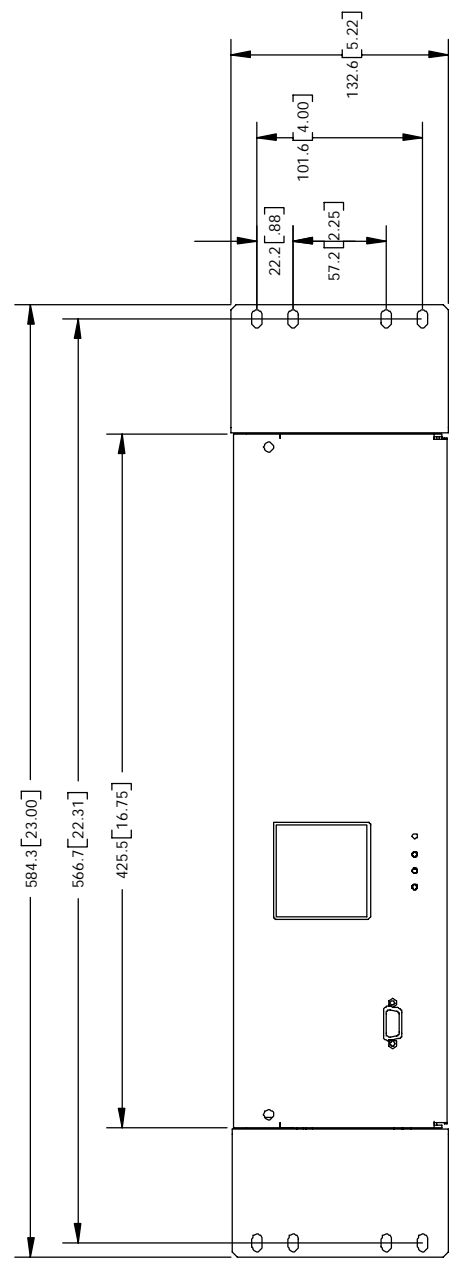
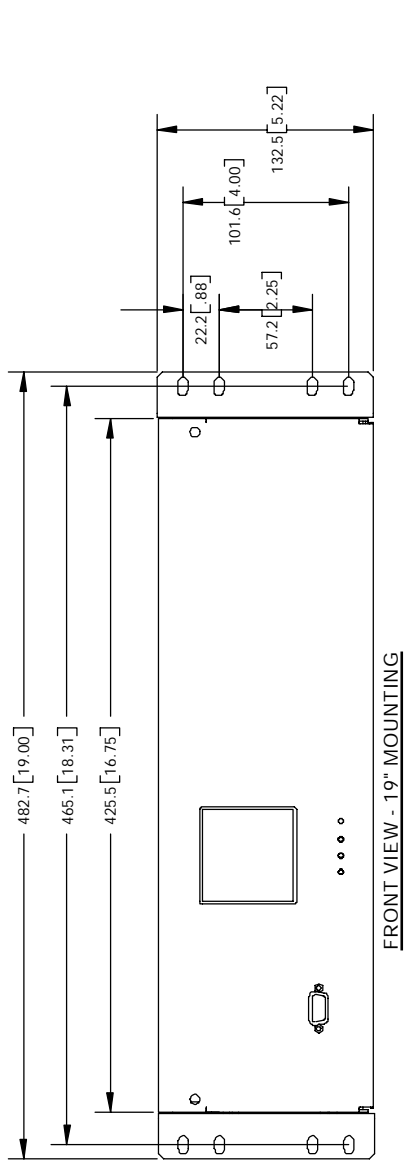
- “-06” Outline Drawing
- “-08” Customer Connections
- “-20” Main Assembly

Argus uses an eight-digit part numbering system for all components and sub assemblies. Each part is covered by its own unique number. Due to the quantity, categories will not be listed within this manual.

7.2 Acronyms and Definitions

- AC Alternating current
- AWG American wire gauge
- CAN Controller Area Network
- CEC Canadian Electrical Code
- CEMF Counter electro-motive force
- COM Common
- CPU Central processing unit
- CSA Canadian Standards Association
- CX Cordex series; e.g., CXC for Cordex™ System Controller
- DC Direct current
- DCCT Direct-current current transformer
- EMC Electromagnetic compatibility
- FCC Federal Communications Commission (USA)
- GUI Graphical user interface
- LAN Local area network
- LCD Liquid crystal display
- LED Light emitting diode
- LVD Low voltage disconnect
- NC Normally closed
- NEC National Electrical Code (USA)
- NO Normally open
- OSHA Occupational Safety & Health Administration
- PDA Personal digital assistant
- PSTN Public switched telephone network
- RAM Random access memory
- RU Rack unit (1.75")
- SNMP Simple network management protocol
- TCP/IP Transmission control protocol / internet protocol
- UL Underwriters Laboratories

REVISONS	
LR	DESCRIPTION



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DESIGN	EST	2007/06	MATERIAL	...
DRAWN	J.U.	2007/08		
CHECKED				
APPROVED				
TOLERANCES		PER P.O. #112		
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X.XXX	±0.20mm	SCALE		
X.XXX	±0.01"			

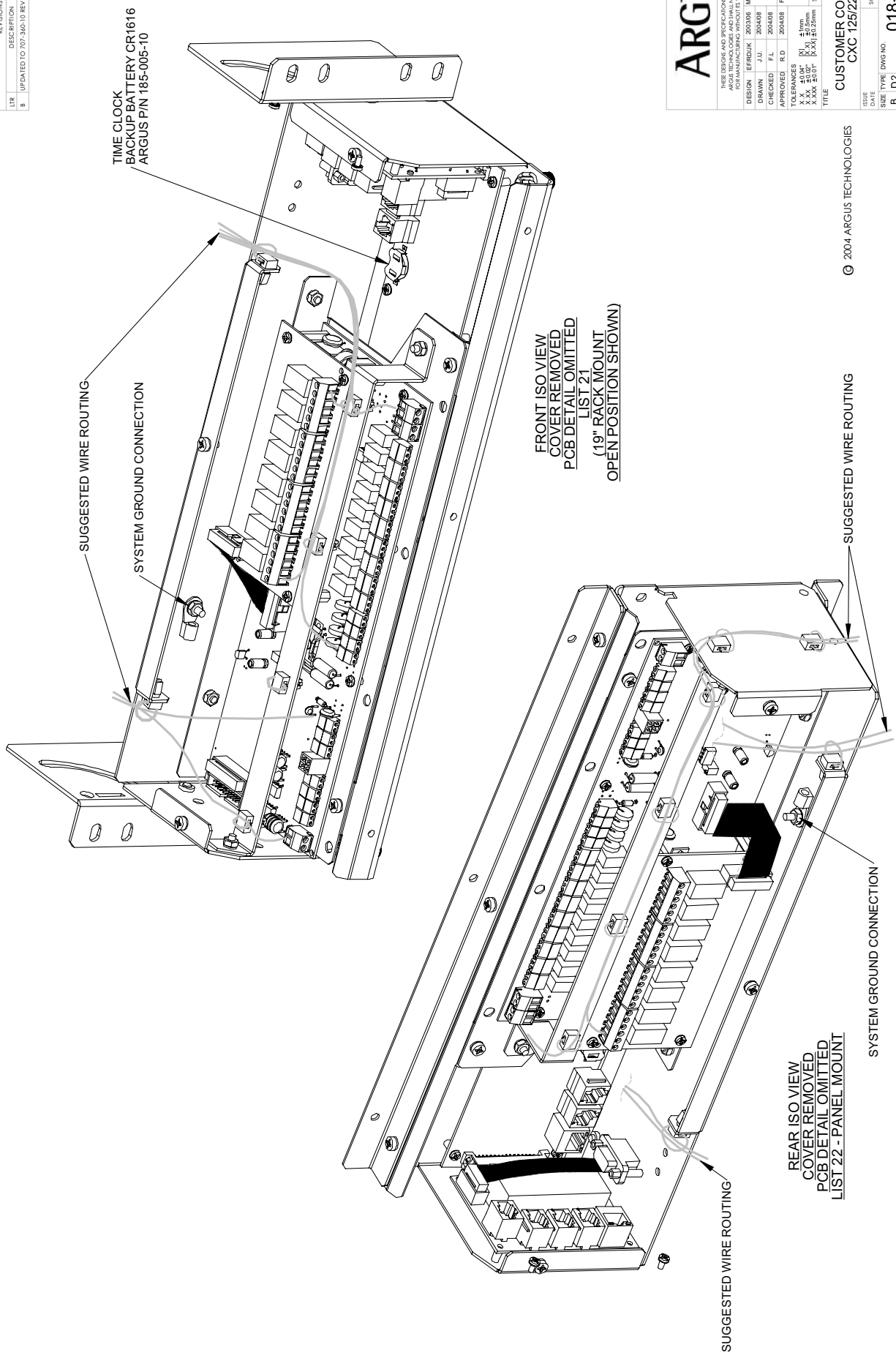
TITLE: OUTLINE DRAWING
CXC 125/220VDC

ISSUE	DATE	SIZE	TYPE	DWG. NO.	SHEET	OF	REV
B	D2			018-570-06	3	3	A

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DIMENSIONS ARE IN INCHES WITH METRIC [mm] IN BRACKETS: INCHES [mm]

REVISIONS			
LTR	DESCRIPTION	DATE	APPD
B	UPDATED TO 707-340-10 REV B PCB	2005/01	



FRONT ISO VIEW
COVER REMOVED
PCB DETAIL OMITTED
LIST 21
(19" RACK MOUNT
OPEN POSITION SHOWN)

REAR ISO VIEW
COVER REMOVED
PCB DETAIL OMITTED
LIST 22 - PANEL MOUNT

ARGUS

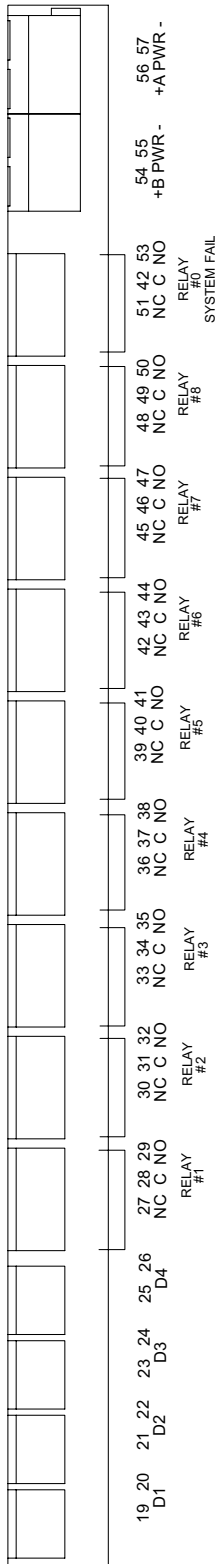
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DESIGN	EFRODUK	2003/08	MATERIAL	...
DRAWN	J.J.	2004/08		
CHECKED	F.L.	2004/08		
APPROVED	R.D.	2004/08	FINISH	...
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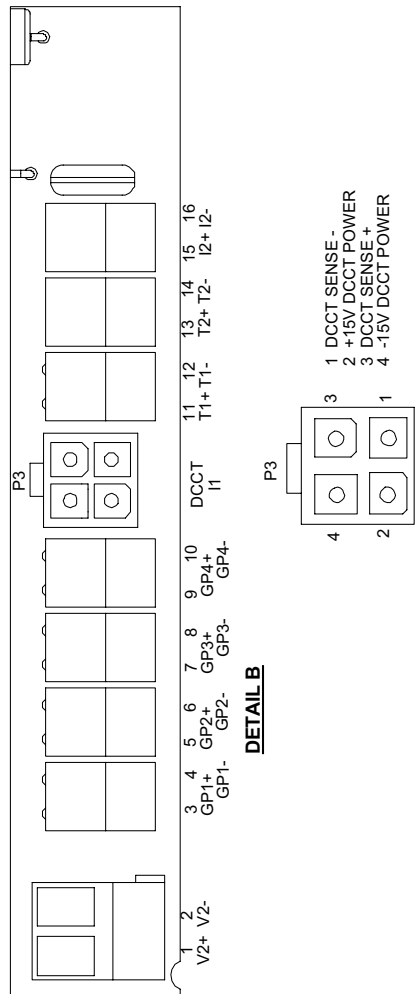
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CUSTOMER CONNECTION
CXC 125/220VDC

ISSUE DATE SHEET 1 OF 4
SIZE TYPE DWG NO. REV B D2 018-570-08 B

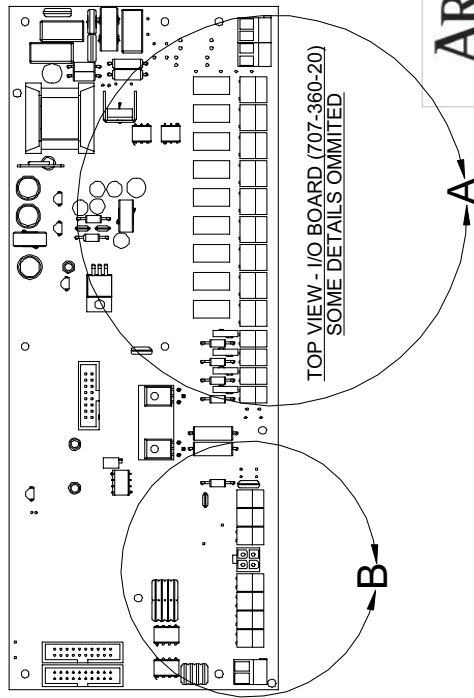
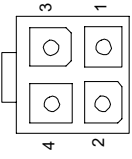
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DETAIL A



DETAIL B



V2	GP1	GP2	GP3	GP4	I1	T1	T2	I2
CHARGE VOLTAGE	VOLTAGE #3	VOLTAGE #4	VOLTAGE #5	VOLTAGE #6	DCCT INPUT	TEMP PROBE #1	TEMP PROBE #2	CURRENT #2

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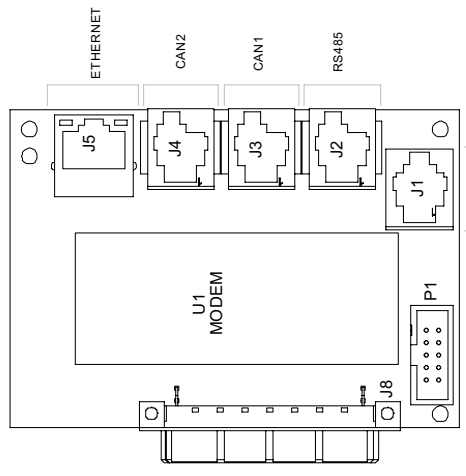
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CHECKED	FL	200408		
APPROVED	R.D	200408	FINISH	...
TOLERANCES				
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X.XXX	±0.02"	Ø	±0.10mm	Doc: 076-064-03
X.XXX	±0.01"	Ø	±0.25mm	SCALE 1:2

TITLE
CUSTOMER CONNECTION
CXC 125/220VDC

ISSUE DATE SHEET 2 OF 4
 SIZE TYPE DWG NO. REV B D2 018-570-08 B

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REV	DESCRIPTION	DATE	APPD



TOP VIEW - COMMUNICATION BOARD (707-329-20)
 LIST 95 - EXPANSION BOARD, COMMUNICATION

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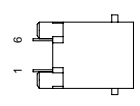
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DRAWN	JJU	200408		
CHECKED	FL	200408		
APPROVED	R.D	200408	FINISH	
TOLERANCES			PER P.O. and	
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X.XX	±0.15"	Ø		
X.XXX	±0.01"	[XXX] ±0.25mm	SCALE	1:2

TITLE: CUSTOMER CONNECTION
 CXC 125/220VDC

ISSUE: 3 OF 4
 DATE:

SIZE: TYPE DWG NO. B D2 018-570-08 B

RJ12 OFFSET



1. GND
2. RS485+
3. RS485-
4. RS485+
5. SCI EN
6. NC

RJ11



1. NC
2. RING
3. TIP
4. NC

RJ12 OFFSET

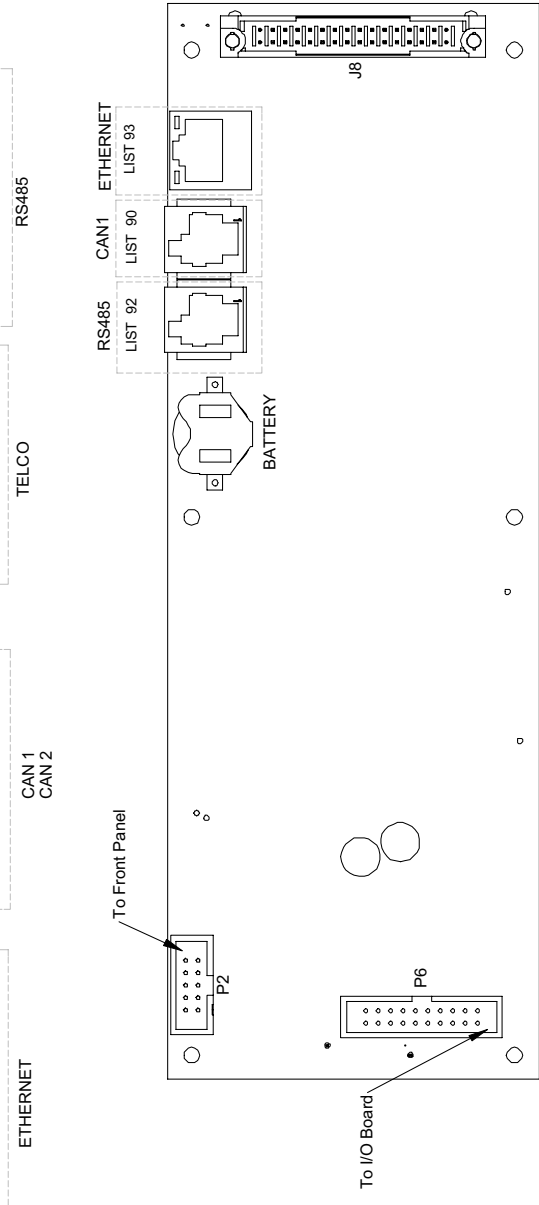


1. GND
2. CANH
3. CANL
4. CANL
5. CANH
6. NC

RJ45



1. TX+
2. TX-
3. RX+
4. COM1
5. COM1
6. RX-
7. COM2
8. COM2

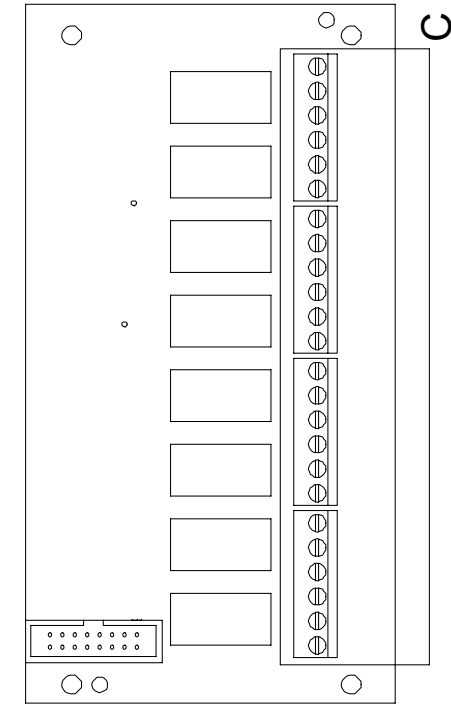


TOP VIEW-MOTHER BOARD (707-314-20)
 SOME DETAILS OMITTED

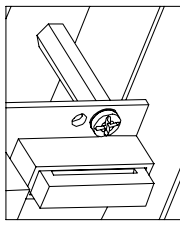
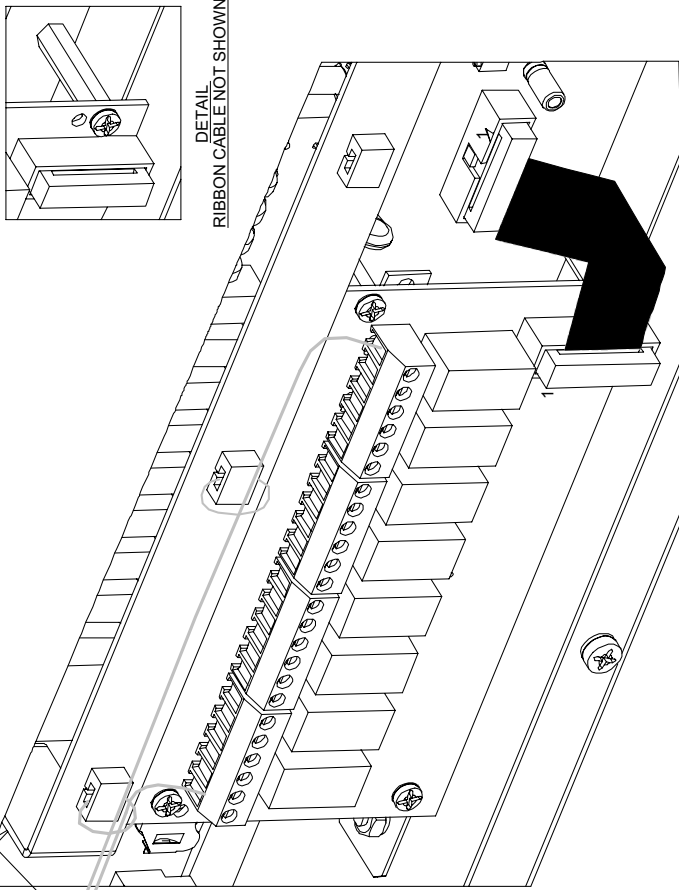
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REV	DESCRIPTION	DATE	APPROVED

SUGGESTED WIRE ROUTING



TOP VIEW-EXPANSION BOARD(707-179-20)
LIST 96-EXPANSION BOARD, OUTPUT RELAY, 8 X TA FORM C, INTERNAL



DETAIL
RIBBON CABLE NOT SHOWN

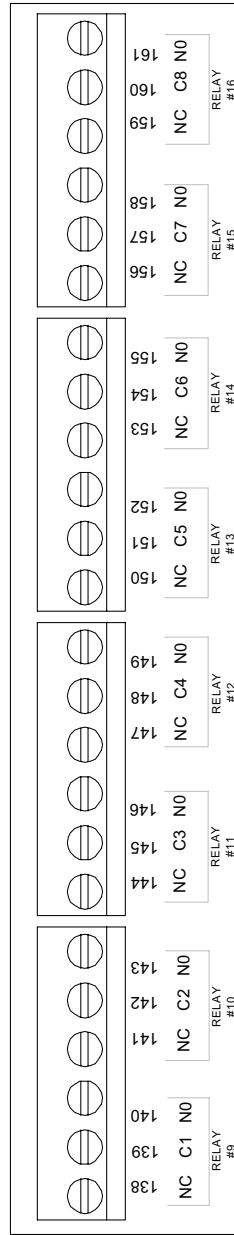
REAR VIEW
DETAIL WITH EXPANSION BOARD MOUNTED ON

TB9

TB8

TB7

TB6



DETAIL C,
SCALE 2:1

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DESIGN	EFFROUK	200308	MATERIAL	...
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CHECKED	F.L.	200408		
APPROVED	R.D.	200408	FINISH	...

PER P.O. and
Doc: 076-06-4-03
X.XX 400" X.XX 400"
X.XXX 500" X.XX 500"
SCALE 1:2

TITLE
CUSTOMER CONNECTION
CXC 125/220VDC

ISSUE	DATE	SHEET	OF
B	D2	4	4

SIZE TYPE DWG NO. **018-570-08 B**

FACTORY SERVICE INFORMATION

Technical Support

Technical support staff are available for answering general questions related to installation, operation and maintenance of Argus products. In Canada and the USA, call Argus toll free 7:30 am to 5:00 pm Pacific Standard Time at:

1-888-GO-ARGUS

(1-888-462-7487)

For emergencies, call 1-888-GO-ARGUS 24 hours a day, seven days a week.
Customers outside Canada and the USA, call 604-436-5547 for technical support.

Training

Argus offers various levels of product and technical training. These workshops provide a mix of theory and hands on application for qualified customers. Please consult your sales representative for course schedules, locations and costs, or visit our website at argusdcpower.com.

Factory Repair and Servicing

All service, beyond initial adjustments, should be carried out by qualified factory service personnel. For these procedures, please contact Argus Technologies at the locations listed to the right.

Product Returns

Before returning any product for service, please obtain a Return Material Authorization (RMA) number from an Argus factory service representative. The representative will require the model and serial number, as well as a brief description of the problem prior to issuing the RMA number. All material must be pre-authorized before being returned.

See document 048-507-10 "Warranty and Repair Information" for more details.

Moving and Storage

Units must be suitably packed in the original shipping container (or equivalent) prior to re-shipping. The box should be completely enclosed and constructed of wood or double-wall, corrugated cardboard. At least 3" of foam or shock absorbing packing material must surround the unit.

Factory Service Centers

Canada and International

Argus Technologies Ltd.
5700 Sidley Street
Burnaby, BC, V5J 5E5 Canada
Tel: 604-436-5900
Fax: 604-436-1233
Email: support@argus.ca

USA

Argus Technologies Inc.
ATTN: RMA Returns
3116 Mercer Avenue
Bellingham, WA, 98225 USA
Tel: 604-436-5900
Fax: 604-436-1233
Email: support@argus.ca

South America

Argus Technologies Argentina
Santo Tome 2573, Capital Federal
Buenos Aires, 1416 Argentina
Tel: 54-11-4504-4698
Cell: 54-9-11-4993-9996
E-pager: 541149939996@nextel.net.ar

Central America

Argus First
Anatole France No. 17
Col. Polanco
Mexico City, 11560 Mexico
Tel: 52-55-5280-6990
Fax: 52-55-5280-6585

Europe

Alpha Technologies Europe Ltd.
Cartel Business Estate
Edinburgh Way
Harlow, Essex, CM20 2DU UK
Tel: 44-1279-422110
Fax: 44-1279-423355

Asia-Pacific

Com10 International
Unit R5, 391 Park Road
Regents Park Estate
Regents Park, NSW, 2143 Australia
Tel: 61-2-9722-3310
Email: support@com10.com.au

PCM Electronics (Dong Guan) Co., Ltd.
ZhenAn Hi-Tech Industrial Park
ZhenAn Road, ChangAn Town
DongGuan City, GuangDong, 523875 China
Tel: 86-769-533-2600
Fax: 86-769-532-6603

Africa-Middle East

Com10 International
Unit R5, 391 Park Road
Regents Park Estate
Regents Park, NSW, 2143 Australia
Tel: 61-2-9722-3310
Email: support@com10.com.au

Authorized Service Center

Canada

Compower Systems Limited
118 Tiffield Road
Toronto, ON, M1V 5N2 Canada
Tel: 416-293-3088
Fax: 416-293-0671

