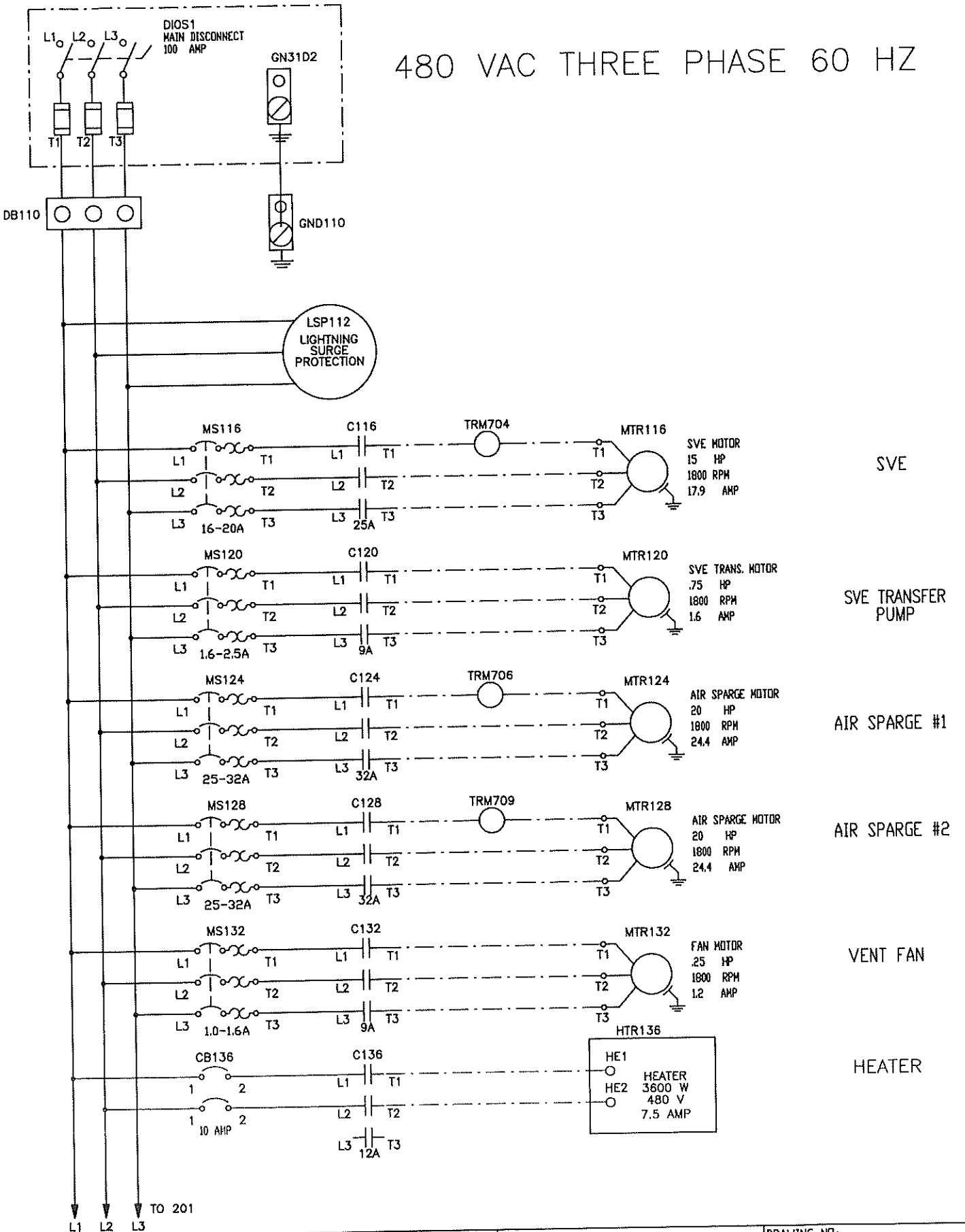
Fliteway Technologies, Inc.

System Control Panel

2129 East Birchwood Ave. Cudahy, WI 53110

(414) 483-5600 1-800-236-3580 FAX (414) 483-1957

480 VAC THREE PHASE 60 HZ



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DRAWN BY	03/29/12	Flightway
CKD BY		CLS

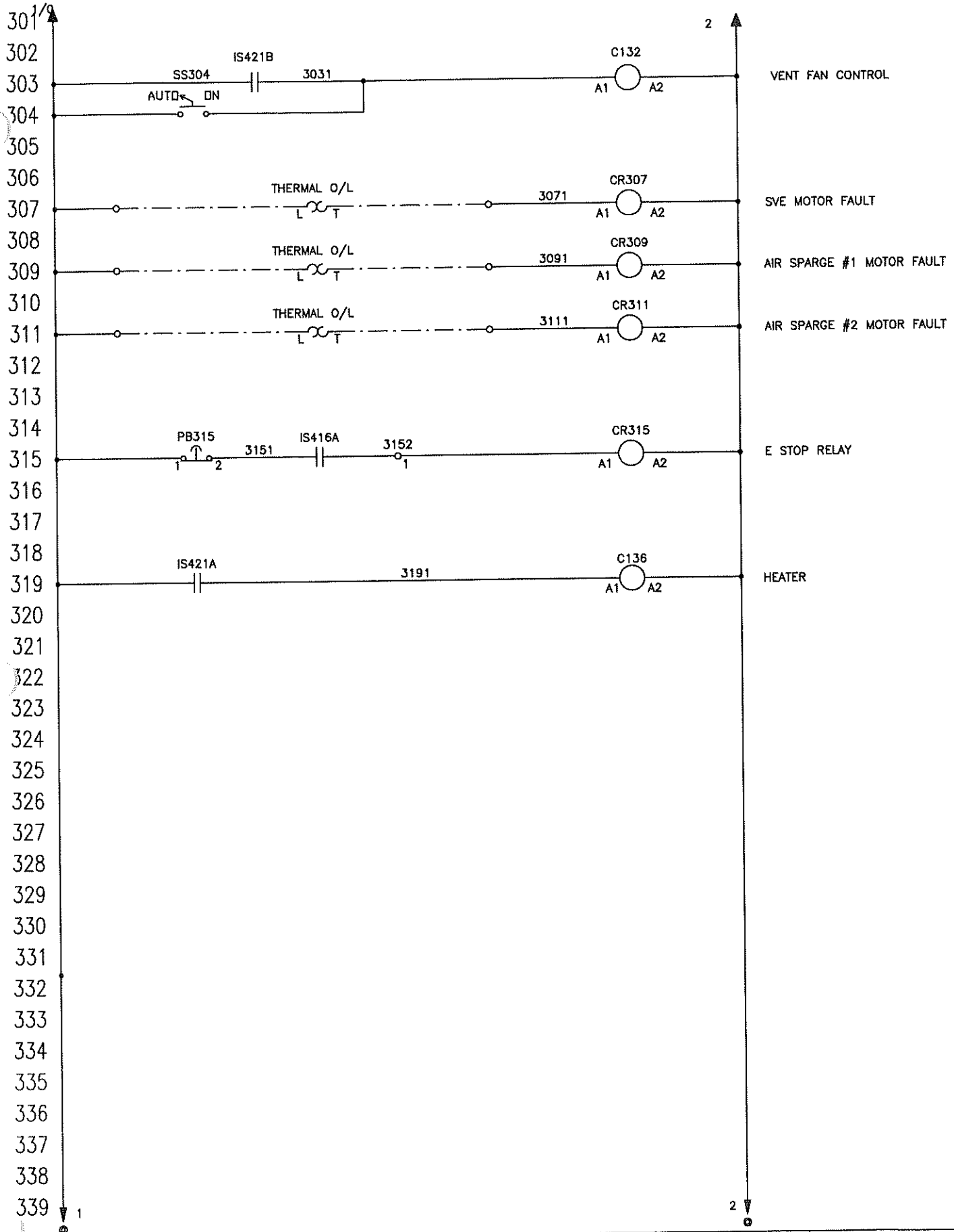
Fliteway Technologies, Inc.
2129 East Birchwood Avenue
Cudahy, Wisconsin 53110
1-800-236-3580

PROJECT: Q14190 REV2.1 (AS BUILT)

DRAWING-NO.:

JOB-NO.:

PAGE DESCRIPTION: Olsson Associates



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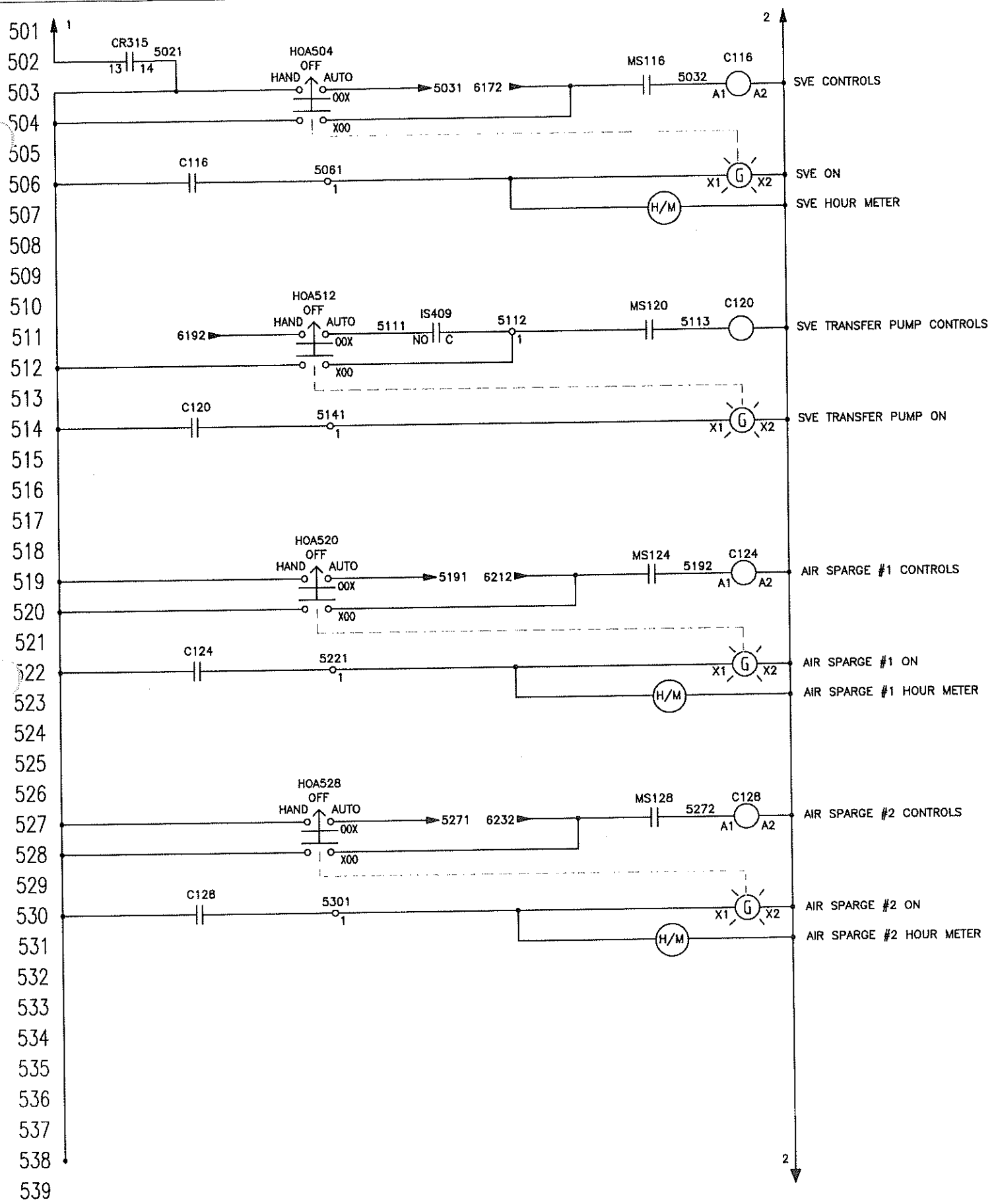

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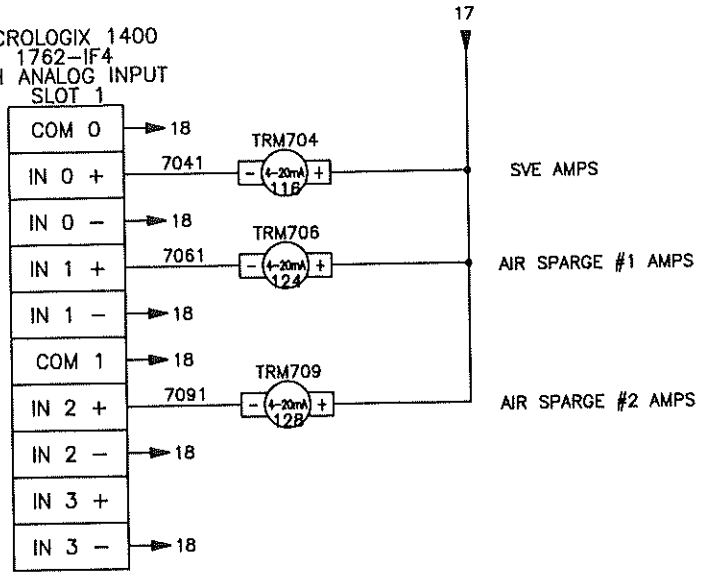

	DATE	NAME
DRAWN BY	06/01/12	Box
CKD BY		Sean

Fliteway Technologies, Inc.
2129 East Birchwood Avenue
Cudahy, Wisconsin 53110
1-800-236-3580

PROJECT: Q14190 REV2.1 (AS BUILT)

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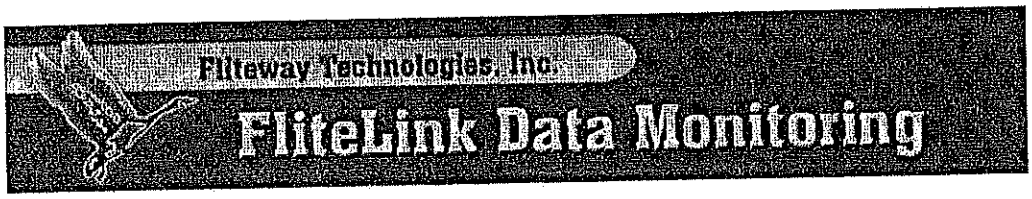
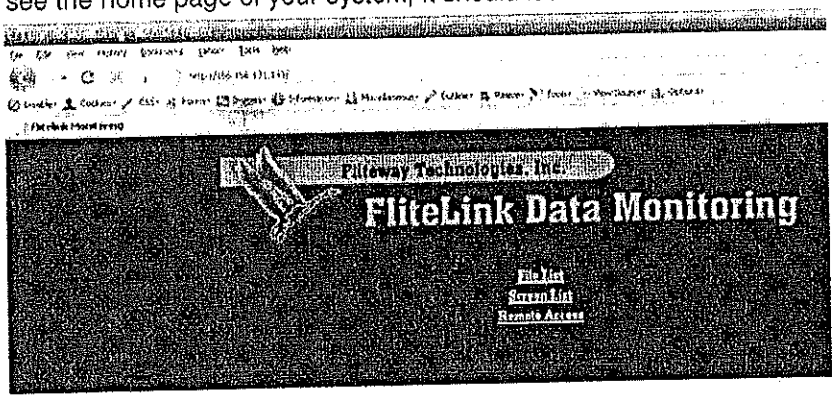


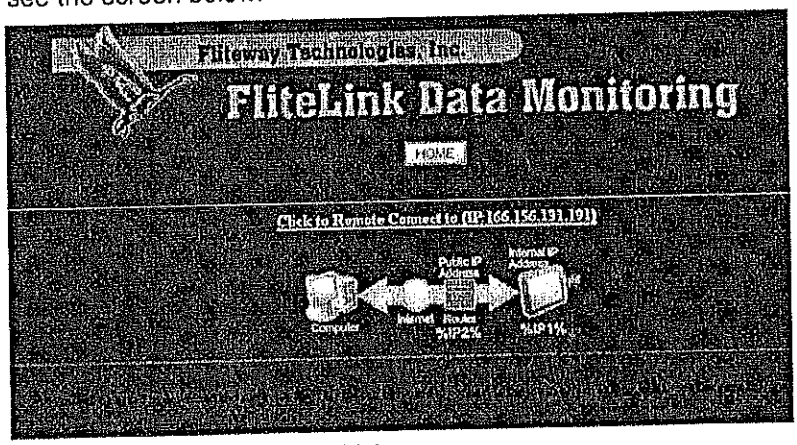
To connect to your remote system:

1. Open a new tab or window of your favorite web browser.
2. In the address bar type your systems IP address. Press enter or go.
3. You will see the home page of your system, It should look similar to the below image.



To view and control the system:

1. Open the home screen. (follow steps above)
2. Select the option named "Remote Access"
3. You will see the screen below.



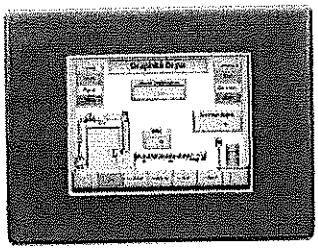
4. Click the "Click to Remote Connect" Link.
5. You will be asked to download a file named "EA-CON.exe".
6. Once downloaded, run the .exe and you will be prompted for a username and password. They both are "adm".
7. The .exe file can be reused.

Fliteway Technologies, Inc. 2129 E. Birchwood Ave. Cudahy, WI 53110
Phone: (414)483-5600 Fax: (414)483-1957

C-more 6" TFT Color Touch Panel - Full Model

Part No. EA7-T6CL

6-inch C-more color TFT touch panel (5.7 inch viewable screen), 64K colors, 320 x 240 pixel QVGA screen resolution, 333 MHz CPU, 24 VDC (20.4-28.8 VDC operating range), NEMA 4/4X, IP65 (when mounted correctly; for indoor use only), non-replaceable LED backlight, 50,000 hour half-life. Built-in Ethernet and USB; supports Compact Flash.



Features

- 5.7" diagonal color TFT (Thin Film Transfer) LCD display with 64K colors
- 320 x 240 pixel resolution
- 270 NITS display brightness
- 50,000 hour average backlight lifetime
- Analog resistive (1024 X 1024) touch screen allowing unlimited touch areas
- USB port B (program/download) and USB port A (USB device options)
- Ethernet 10/100 Base-T port (program/download & PLC comm)
- Remote Internet Access
- Serial PLC interface (RS-232/422/485)
- 1 GByte CompactFlash card slot, built-in
- Expansion assembly (optional) for CompactFlash devices (use with optional CF Card Interface Module)
- 24 VDC powered, 110 VAC power adapter (optional)
- Audio Line Out, stereo - requires amplifier and speaker(s)
- 10 MByte project memory
- Data logging
- 0 to 50°C (32 to 122°F) operating temperature range
- NEMA 4/4X, IP65 compliant when mounted correctly, indoor use only
- Slim design saves panel space
- UL, cUL & CE agency approvals
- 2-year warranty from date of purchase

Function	Available	Associated Features
Ethernet	Yes	FTP - Email - Web Server
USB	Yes	Data Logging
Compact Flash	Yes	Data Logging/Project
Expansion Assembly	Yes	CF Module & future modules
Audio Out	Yes	Speaker/Amplifier Connection
Ethernet	Yes	Remote access over Internet

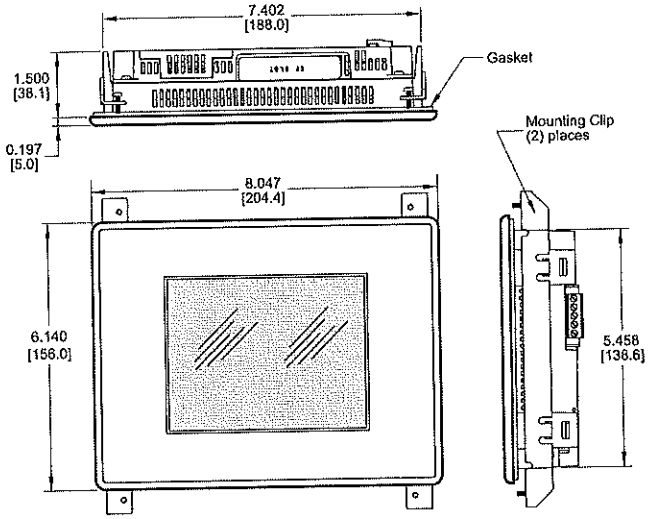
c UL us CE

<--->

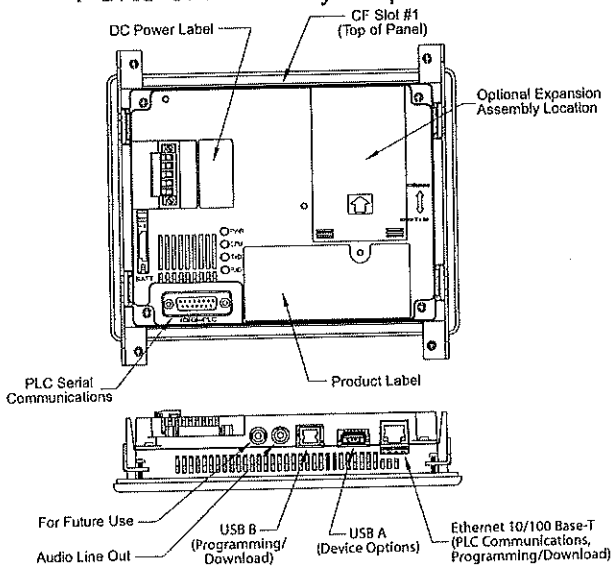
PLC Drivers	
Serial	**Avail.**
Productivity3000	Yes
AutomationDirect CLICK	Yes
*Direct*LOGIC K-sequence	Yes
*Direct*NET	Yes
Modbus (Koyo Addressing)	Yes
Allen-Bradley DF1 Full & Half Duplex	Yes
Allen-Bradley PLC5 DF1	Yes
Allen-Bradley DH-485	Yes
Allen-Bradley DF1 Full & Half Duplex - Tag Based (ControlLogix™ and CompactLogix™)	Yes
Modbus RTU	Yes
Entivity Modbus RTU	Yes
GE SNPX (90/30, 90/70), Micro 90, VersaMax Micro)	Yes
Omron Host Link C200 Adapter C500	Yes
Omron FINS (CJ1, CS1)	Yes
Mitsubishi FX	Yes
Mitsubishi Q02, Q02H, Q06H, Q12H, Q25H	Yes
Mitsubishi Q, QnA Serial	Yes
Siemens PPI (S7-200 CPU)	Yes
Ethernet	
Productivity3000	Yes
*Direct*LOGIC Ethernet	Yes
Modbus TCP/IP	Yes
Entivity Modbus TCP/IP	Yes
Allen-Bradley EtherNet/IP™ Server - Generic I/O Messaging*	Yes
Allen-Bradley EtherNet/IP Client - Tag Based (ControlLogix™ and CompactLogix™)	Yes
Allen-Bradley EtherNet/IP Client - MicroLogix 1100 & SLC 5/05 via native Ethernet port; MicroLogix 1000, 1100, 1200, 1400, 1500 & SLC 5-03, 04, 05 via AB ENI Adapter	Yes
Omron FINS	Yes
Mitsubishi Q, QnA Ethernet	Yes
Siemens (S7-200 CPU, S7-300 CPU)	Yes

Dimensions

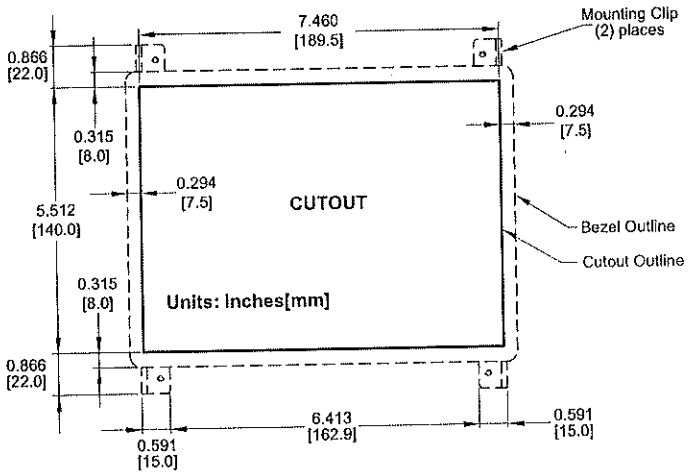
inches / [mm]



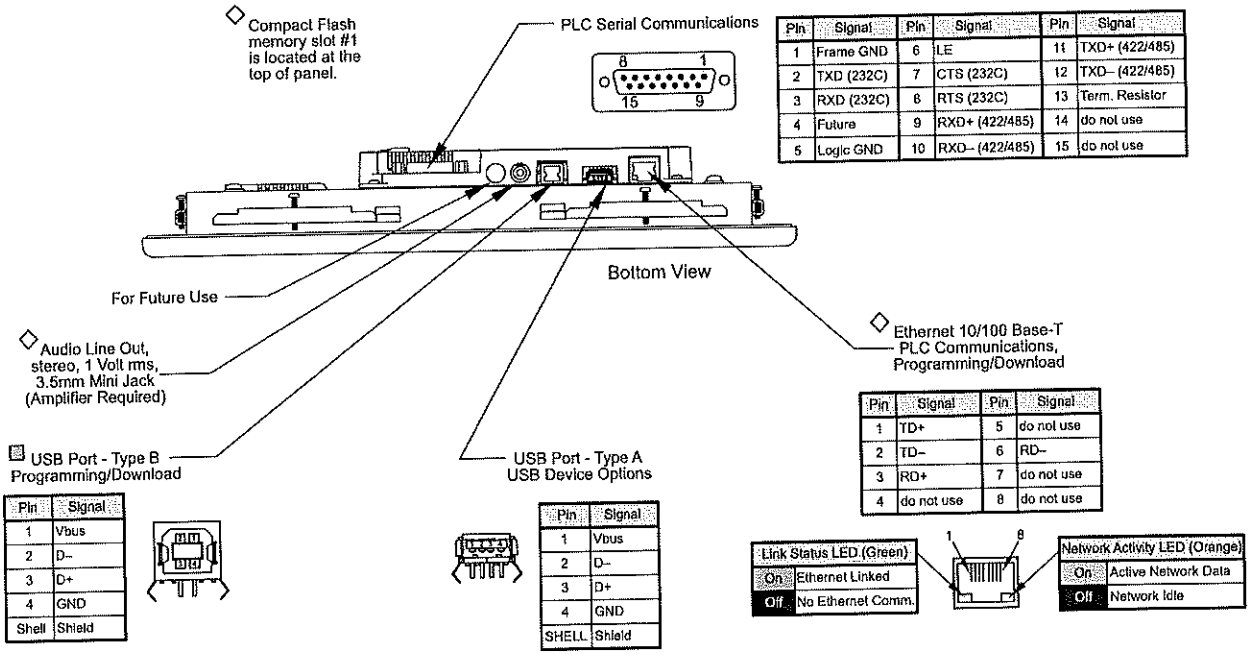
Ports & Memory Expansion



Mounting Cutout



C-more Communication Ports



Pin	Signal	Pin	Signal	Pin	Signal
1	Frame GND	6	LE	11	TXD+ (422/485)
2	TXD (232C)	7	CTS (232C)	12	TXD– (422/485)
3	RXD (232C)	8	RTS (232C)	13	Term. Resistor
4	Future	9	RXD+ (422/485)	14	do not use
5	Logic GND	10	RXD– (422/485)	15	do not use

Pin	Signal	Pin	Signal
1	TD+	5	do not use
2	TD–	6	RD–
3	RD+	7	do not use
4	do not use	8	do not use

Pin	Signal
1	Vbus
2	D–
3	D+
4	GND
Shell	Shield

Pin	Signal
1	Vbus
2	D–
3	D+
4	GND
SHELL	Shield

◇ Note: Device is not available on Base Feature touch panels, part numbers EA7-S6M-R and EA7-T6CL-R.

▣ Note: Use USB Programming Cable, such as p/n USB-CBL-AB15.

Ethernet Port

The Ethernet port has several uses:

- Download program to panel
- Communicate to PLCs/PCs
- Send e-mail
- Access FTP server
- Act as a Web server
- Remote Internet Access

The Ethernet port has an RJ-45 8-wire modular connector with green and orange LEDs.

- The orange LED indicates the Ethernet communication status. It illuminates when there is data activity on the network.
- The green LED indicates link status and illuminates when a link is established.

Ethernet connections:

- Productivity3000
- ***Direct***LOGIC Ethernet
- Modbus TCP/IP
- Allen-Bradley EtherNet/IP™ Server - Generic I/O Messaging (ControlLogix™, CompactLogix™, and FlexLogix™)
- Allen-Bradley EhterNet/IP Client - Tag Based (ControlLogix, CompactLogix, and FlexLogix™)
- Allen-Bradley EtherNet/IP Client - MicroLogix 1100 & SLC 5/05, both via native Ethernet port
- Allen-Bradley MicroLogix 1000, 1100, 1200, 1500, SLC 5-03/04/05, all via ENI Adapter
- Entivity Modbus TCP/IP
- Omron Ethernet FINS
- Siemens Ethernet ISO over TCP

Note: The base panels (-R part numbers) do not include an Ethernet port, and do not have these capabilities.

USB Port B

Program C-more via the USB programming port. It's fast and easy, with no baud rate settings, parity, or stop bits to worry about. We stock standard USB cables for your convenience. USB Port B can be used to upload or download projects to and from a PC.

USB Port A

The Universal Serial Bus (USB) Port A is a standard feature for all models and can be used to connect various USB HID (Human Input Device) devices to the panel, such as:

- USB pen drives, (SDCZ4-2048-A10)
- USB keyboards
- USB barcode scanners
- USB card scanners

C-more can log data to the USB pen drive as well as load projects to the panel from the pen drive. You can also back up project files and panel firmware.

Sound Interface (Audio Line Out)

When attached to an amplifier and speaker(s), C-more can play warning sounds or pre-recorded messages such as: "conveyor is jammed". C-more supports WAV type files. The output is stereo.

Serial Port

The serial port is an RS-232, RS-422 or RS-485 female 15-pin D-sub connector. Use this port for serial connections to PLCs. The port supports the following PLC protocols:

All AutomationDirect.com PLCs:
- Productivity3000
- ***Direct***LOGIC K-sequence
- ***Direct***NET
- Modbus (Koyo Addressing)
- CLICK

Allen Bradley:
- DF1 Full & Half Duplex
- DF1 Full & Half Duplex - Tag Based
- PLC5 DF1
- DH485

Modbus RTU
Entivity Modbus RTU
GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro)
Omron:
- Host Link (C200 Adapter, C500)
- FINS (CJ1, CS1)

Mitsubishi:
- Melsec FX
- Q/QnA

Siemens PPI (S7-200 CPU)

C-more Communication Protocols & Cables

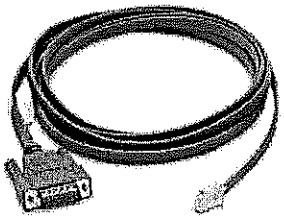
Compatibility Table

PLC Family	Model		Protocols
Allen-Bradley	MicroLogix 1000/1100/1200/1400/1500, SLC 5-/01/02/03, PLC5		DH485/AIC/AIC+
	MicroLogix 1000, 1100, 1200 and 1500		DF1 Half Duplex; DF1 Full Duplex
	SLC 5-/03/04/05		
	ControlLogix™, CompactLogix™, FlexLogix™		
	PLC-5		DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Tag Based		DF1 Half Duplex; DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Generic I/O Messaging		EtherNet/IP Server
	ControlLogix, CompactLogix, FlexLogix - Tag Based		EtherNet/IP Client
	MicroLogix 1100 & SLC 5/05, both via native Ethernet port		
	MicroLogix 1000, 1100, 1200, 1400,1500 & SLC 5-03/04/05, all via ENI Adapter		
Modbus TCP/IP	Modbus TCP/IP devices		Modbus TCP/IP
GE	90/30, 90/70, Micro 90, VersaMax Micro		SNPX
Mitsubishi	FX Series		FX Direct
	Q02, Q02H, Q06H, Q12H, Q25H		Q CPU
	Q, QnA Serial		QnA Serial
	Q, Qna Ethernet		QnA Ethernet
Omron	C200 Adapter, C500		Host Link
	CJ1/CS1 Serial, CJ1/CS1 Ethernet		FINS
Modicon	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU: 311-xx, 411-xx, 512-xx, 612-xx		Modbus RTU
Siemens	S7-200 CPU, RS-485 Serial		PPI
	S7-200 CPU, S7-300 CPU; Ethernet		Ethernet ISO over TCP
Productivity3000	Productivity3000 Serial (P3-550)		AutomationDirect P3000 Serial
	Productivity3000 Ethernet (P3-550)		AutomationDirect P3000 Ethernet
CLICK	all		AutomationDirect Modbus (CLICK)
DirectLOGIC	DL05/DL06	all	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		H0-ECOM/H0-ECOM100	DirectLOGIC Ethernet
	DL105	all	K-Sequence
	DL205	D2-230	K-Sequence
		D2-240	K-Sequence
			DirectNET
		D2-250/D2-250-1/D2-260	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		D2-240/D2-250-1/D2-260 Using DCM	DirectNET
			Modbus (Koyo addressing)
		H2-ECOM/H2-ECOM100	DirectLOGIC Ethernet
	DL305	D3-330/330P (Requires the use of a Data Communications Unit)	DirectNET
		D3-340	DirectNET
		D3-350	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		D3-350 DCM	DirectNET
			Modbus (Koyo addressing)
	DL405	D4-430	K-Sequence
			DirectNET
		D4-440	K-Sequence
			DirectNET
		D4-450	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		All with DCM	DirectNET
			Modbus (Koyo addressing)
		H4-ECOM/H4-ECOM100	DirectLOGIC Ethernet
	H2-WinPLC (Think & Do) Live V5.2 or later and Studio any version		Think & Do Modbus RTU (serial port)
	H2-WinPLC (Think & Do) Live V5.5.1 or later and Studio V7.2.1 or later		Think & Do Modbus TCP/IP (Ethernet port)

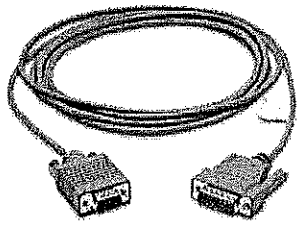
Cable Description	Cable Part Number	Price
Productivity3000 AutomationDirect CLICK, DirectLOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C)	EA-2CBL	<--->
DirectLOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C)	EA-2CBL-1	<--->
DirectLOGIC PLC RJ-11 port, D3-340 (RS-232C)	EA-3CBL	<--->
DirectLOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C)	EA-4CBL-1	<--->
DirectLOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C)	EA-4CBL-2	<--->
Allen-Bradley MicroLogix 1000, 1100, 1200, 1400 & 1500 (RS-232C)	EA-MLOGIX-CBL	<--->
Allen-Bradley SLC 5-03/04/05 ControlLogix, CompactLogix FlexLogix, DF1 port (RS-232C)	EA-SLC-232-CBL	<--->
Allen-Bradley PLC-5 DF1 port (RS-232C)	EA-PLC5-232-CBL	<--->
Allen-Bradley SLC 500 DH485 port (RS-485A)	EA-DH485-CBL	<--->
GE 90/30, 90/70, Micro 90, VersaMax Micro 15-pin D-sub port (RS-422A)	EA-90-30-CBL	<--->
MITSUBISHI FX Series 25-pin port (RS-422A)	EA-MITSU-CBL	<--->
MITSUBISHI FX Series 8-pin mini-DIN (RS-422A)	EA-MITSU-CBL-1	<--->
OMRON Host Link C200 Adapter, C500 (RS-232C)	EA-OMRON-CBL	<--->

NOTE: EZTouch serial PLC communication cables are compatible with C-more touch panels.

EA-2CBL



EA-2CBL-1



LISTEN. THINK. SOLVE.®

PRODUCT PROFILE

MicroLogix™ 1400 / 1766

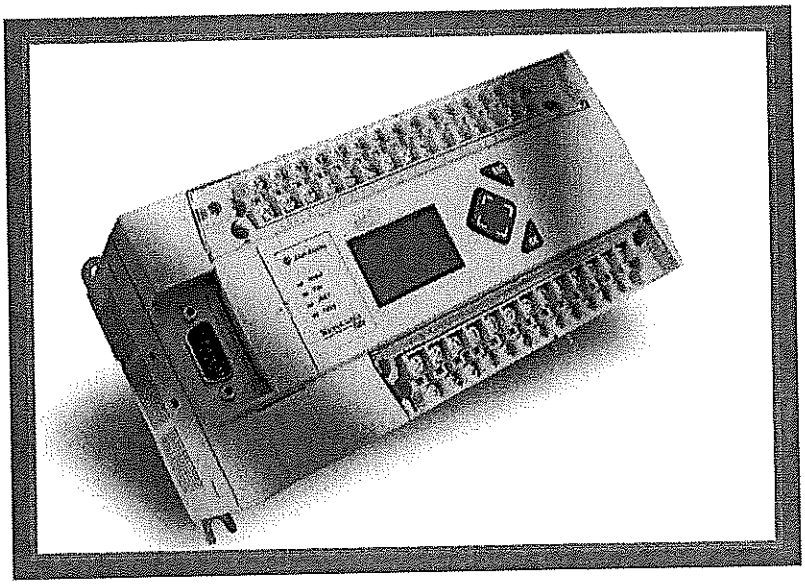
Small Programmable Logic Controller

Advantages

- Expand your application capabilities with up to 7 expansion I/O modules for a maximum of 256 discrete I/O
- Up to 6 embedded 100 kHz high-speed counters (on controllers with dc inputs)
- 2 Serial ports with DF1/ DH485/Modbus RTU/DNP3/ASCII protocol support
- Ethernet port provides you with peer-to-peer messaging, web server and email capabilities
- Built-in LCD with backlight allows you to view controller and I/O status, and provides a simple interface for messages, bit / integer monitoring and manipulation

Target Applications

- *General Industrial Machinery (Material Handling, Packaging, Assembly, etc.)*
- *HVAC/Building Automation*
- *SCADA (Oil & Gas, Water/Waste Water, and Electric Power)*
- *Food & Beverage*
- *Pharmaceutical*
- *Commercial Machinery (Vending, Industrial Washers & Dryers, etc.)*



Overview

The new Allen-Bradley® MicroLogix™ 1400 from Rockwell Automation complements the existing MicroLogix family of small programmable logic controllers. MicroLogix 1400 combines the features you demand from MicroLogix 1100, such as EtherNet/IP, online editing, and a built-in LCD, plus provides you with enhanced features, such as: higher I/O count, faster High Speed Counter/PTO and enhanced network capabilities

Take advantage of the built-in LCD with back lighting to set the Ethernet network configuration, display floating point values on a user configurable display, display OEM logos at startup and read or write any binary, integer and long file elements in the data table. Controllers without embedded analog come with 32 digital I/O count, while analog versions have 32 digital I/O and 6 analog I/O. All versions can be expanded using up to seven 1762 I/O modules - the same I/O modules that MicroLogix 1100 and 1200 utilize.

Three embedded communication ports provide you with superior communications capabilities. MicroLogix 1400 offers an isolated RS232C/RS485 combination port; a non-isolated RS232C port; and an RJ-45 port for 10/100 Mbps EtherNet/IP peer-to-peer messaging.

Similar to the rest of the MicroLogix family, MicroLogix 1400 is programmed with RSLogix 500 programming software (Version 8.1 and above) as well as new RSLogix Micro programming software.

SPECIFICATIONS

MicroLogix	1766-L32BWA	1766-L32AWA	1766-L32BXB	1766-L32BWAA	1766-L32AWAA	1766-L32BXBA
Input Power	120/240 VAC		24 VDC	120/240 VAC		24 VDC
Memory	non-volatile battery backed RAM					
User Program / User Data Space	10 K / 10K configurable					
Data Logging / Recipe Storage	128 K (without Recipe) / up to 64 K (after subtracting Data Logging)					
Battery Back-up	Yes					
Back-up Memory Module	Yes					
Digital Inputs	(12) Fast 24VDC (8) Normal 24VDC	(20) 120VAC	(12) Fast 24VDC (8) Normal 24VDC	(12) Fast 24VDC (8) Normal 24VDC	(20) 120VAC	(12) Fast 24VDC (8) Normal 24VDC
Digital Outputs	(12) Relay	(12) Relay	(6) Relay (3) Fast DC (3) Normal DC	(12) Relay	(12) Relay	(6) Relay (3) Fast DC (3) Normal DC
Analog Inputs / Outputs	None			(4) Voltage Inputs / (2) Voltage Outputs		
Serial Ports	(1)RS232C/RS485*, (1)RS232C**					
Serial Protocols	DF1 Full Duplex, DF1 Half Duplex Master/Slave, DF1 Radio Modem, DH-485, Modbus RTU Master/Slave, ASCII, DNP 3 Slave					
Ethernet Ports	(1) 10/100 EtherNet/IP port					
Ethernet Protocols	EtherNet/IP messaging only					
Trim Potentiometers	2 Digital					
High-Speed Inputs	Up to 6 channels @ 100 kHz	N/A	Up to 6 channels @ 100 kHz	Up to 6 channels @ 100 kHz	N/A	Up to 6 channels @ 100 kHz
Real Time Clock	Yes, embedded					
PID	Yes (limited by loop and stack memory)					
PWM /PTO	N/A		3 channel PTO (100kHz)\PWM (40kHz)	N/A		3 channel PTO (100kHz)\PWM (40kHz)
Embedded LCD	Yes					
Floating Point Math	Yes					
Online Editing	Yes					
Operating Temperature	-20°C to +60°C					
Storage Temperature	-40°C (or -30°C) to +85°C					

* Isolated RS232/RS485 combo port. Same as MicroLogix 1100 Comm 0

** Non-isolated RS232, standard D-sub connector.

www.rockwellautomation.com

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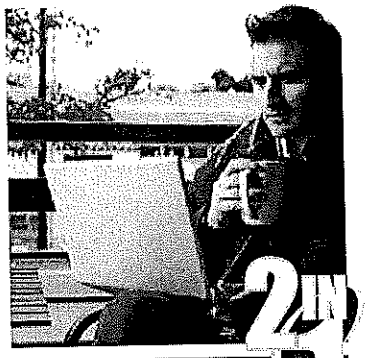
Publication 1766-PP001B-EN-P – February 2010

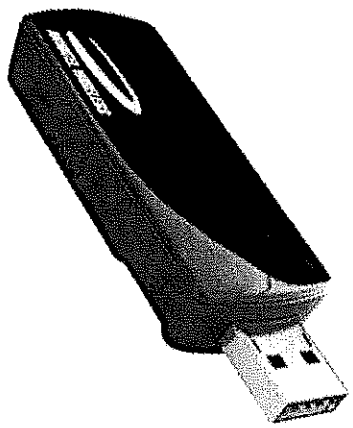
ovation™ MC760



2 IN 1

3.1 Mbps 3G Rev A Wireless Broadband USB Modem with Memory Storage!

Introducing the Ovation™ MC760 modem by Novatel Wireless. The only micro-sized broadband Internet device currently available with NovaSpeed™ software capability and high capacity removable memory storage. The powerful performance of broadband Internet, high capacity removable memory storage and GPS† is now all wrapped up in a thumb-drive sized device.



At just over 2 inches long and weighing less than an ounce, the MC760 Modem delivers performance that belies its micro size. With NovaSpeed technology boosting performance, an advanced internal antenna system and removable microSD™ this plug-and-play mini modem provides a fast, easy Broadband Internet connection with minimal interruptions or buffering on Windows®, Mac®, and Linux® operating systems.

Broadband‡ Internet with NovaSpeed™

NovaSpeed enhances broadband connections by allowing upload and download packets to be sent and received simultaneously, providing a significant performance improvement. With NovaSpeed, experience online gaming and large file transfers with minimized interruptions or buffering.

Removable microSD™ storage up to 8GB

The integrated microSD slot of the MC760 modem provides flexible portable storage options without hindering Internet connection performance. Memory cards* are available in various capacities allowing you to easily transport large files like presentations and videos.

Internal Antenna

The advanced internal dual band diversity antenna design provides high performance with no moving parts to break.

No CD Required for Installation

Designed for Windows and Mac users, MobiLink software conveniently manages remote access in a single, easy to use control panel. No CD is required for installation. Just pop the device into your notebook, allow the MobiLink Installer to launch, follow a few steps and you're connected in no time!

Branding, Customization, and Multiple Language Options

Customization on the device, packaging, collateral, and software keep this offering aligned with OEM's or operator's marketing and branding strategies.

*microSD cards sold separately.
† Network operator dependent.
‡ Account with network operator required.

NOVATEL WIRELESS

Leading Provider of 3G Wireless Broadband Access Solutions for the Global Marketplace

ovation™ MC760

Technical Specifications

3.1 Mbps 3G Rev A Wireless Broadband USB Modem with Memory Storage!

Technology/Bands
- 1xEV-DO Rev. A/0; 1xRTT; 800, 1900 MHz
- GPS

Data Speeds
- EV-DO Rev.A - Up to 3.1 Mbps download
- EV-DO Rev.A - Up to 1.8 Mbps upload

Dimensions and Weight
- 57 mm x 25 mm x 12 mm (2.24" x .98" x.47")
- 19 g (0.67 oz)

Form Factor
- USB
- microSD memory card slot

Environmental
- Operating temperature: 0°C to 45°C
- Storage temperature: -20°C to 65°C

Connectivity Features
- Auto connect
- Auto/user selectable
- Dial up; NDIS support

Text Messaging (SMS-MO/MT)
- Message received notification
- Message delete/reply/forward

Timers/Counters
- Connection time
- Data byte counter

Antenna
- Internal
- Receive diversity 800/1900 MHz
- External Antenna Connector

Power Consumption
- Transmit: max 650mA
- Idle: max 115mA

Zero install, no CD
- MobiLink in flash memory
- Quick Install Drivers for Mac

Operating Systems Supported
- Windows® Vista, XP, 2000
- Mac OS® X 10.3.9 or higher
- Linux®

System Requirements
- Type A USB Port
- Hard Disk Space: 14 MB
- RAM: 32MB
- Internet browser software

Security
- CDMA authentication and identification
- Dynamic MIP key update; CHAP

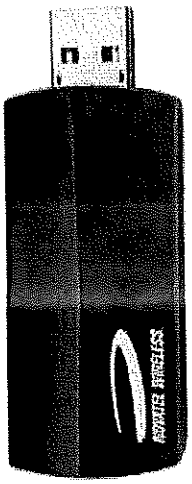
Standards/Approvals/Certifications
- IS 2000 (CDMA 1xRTT)
- IS 637A (SMS)
- IS 683A (Service Provisioning)
- IS 707A (data)
- IS 856A /866 (EV-DO) Rev. A/0
- R&TTE directive 1999 / 5 / EC (health, safety, EMC, spectrum)
- FCC
- CDG (stages 1, 2, 3)

Software and Applications
- NovaSpeed capable
- Plug & Play
- Multi-language support
- Dial-up Connection
- Signal strength
- Connection Status
- Auto-Connect
- Auto-Select Network
- NDIS & EAP-SIM Support
- Address Book
- Network Profile
- Help Menu & Self Diagnostics
- Field Test Data
- Complete Session Statistics

Additional Features
- SDK for dashboard integration
- Supports 3rd party dashboard features including:
  - Network attach/detach
  - User setting of alarm thresholds for on home network, roaming on 'preferred' network, or roaming on 'non-preferred' network

Standard Package Contents
- MC760 Modem
- User Guides (on device)
- Quick Reference Guide
- USB Extension Cable
- Lanyard and Keychain
- USB Protective Cap

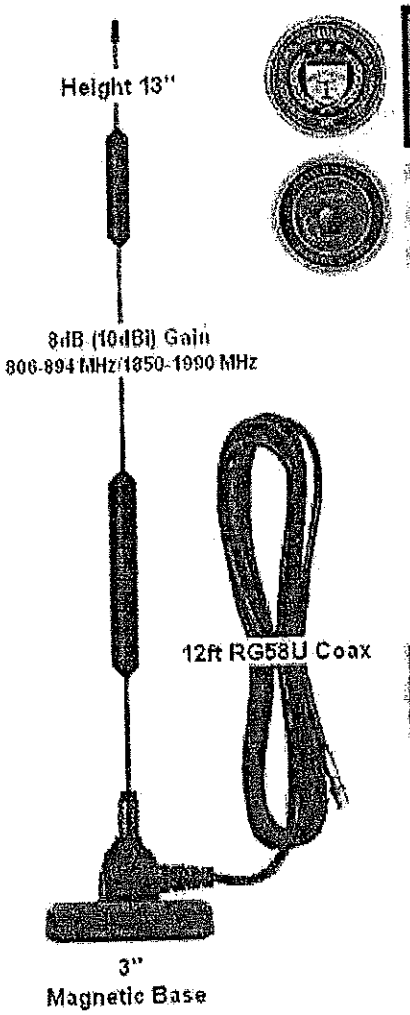
Optional Accessories (sold separately)
- microSD™ card (up to 8GB)
- External Antenna Option



For More Information:
e-mail: sales@nvtl.com

NASDAQ: NVTL
www.novatelwireless.com

NOVATEL WIRELESS.
ISO 9001:2000 Certified



AntennaGear™
Antennas For Wireless Equipment

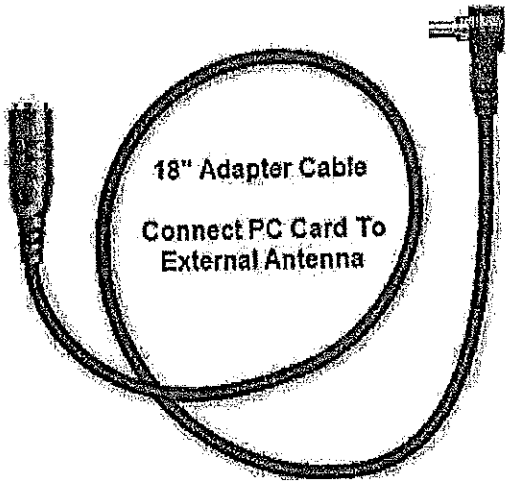
Military Grade Antenna
For
NOVATEL WIRELESS

Includes

1 - 8dB (10dBi) Antenna w/12ft RG58U Coax
(806 ~ 894 MHz / 1850 ~ 1990 MHz)

1 - External Antenna Adapter Cable

1 - 3" Magnetic Mount Base



cradlepoint TECHNOLOGY

wipipe POWERED

MBR800

Failsafe Mobile Broadband Router

3G/4G Primary Connection, Redundancy, Failover/Failback

ALWAYS CONNECTED

The MBR800 is a cost effective mobile broadband router with 3G/4G failover for built-in redundancy. This router is designed to keep business running in the event of a primary ISP failure. When the MBR800 senses a disruption in service, it automatically switches from a wired to a 3G/4G network*. Once service is restored, the MBR800 automatically fails back to your primary ISP - keeping your business online without interruption to users.

In primary connect-type applications, such as kiosks and POS systems, the MBR800 still provides failover capabilities through it's multiple modem ports and allows users to share a 3G/4G connection** without any additional software to load or hardware to configure.

Interruption-Free Access
with 3G/4G Failover/Failback

SIMPLE AND POWERFUL

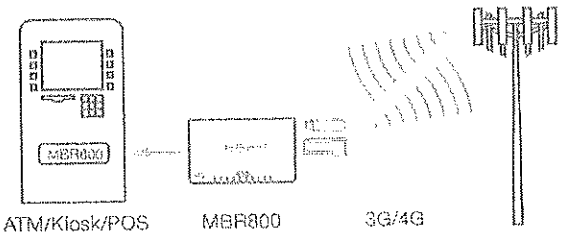
Powered by WiPipe technology, the MBR800 includes many features found in expensive, enterprise-class routers at a fraction of the cost. Features like Load Balancing, SNMP Management, and Failover from Wired-To-3G/4G make the MBR800 a powerful solution that's simple to deploy.

SECURE AND RELIABLE

The high-performance MBR800 comes standard with top security features like multiple concurrent VPN pass-through sessions and a firewall, preventing unauthorized use of your connection. Now you can confidently and securely access the Internet and share your WAN

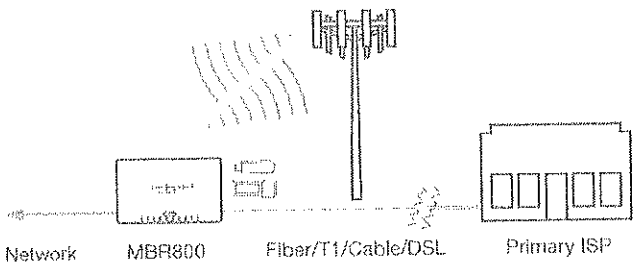
Primary Connection Using the MBR800

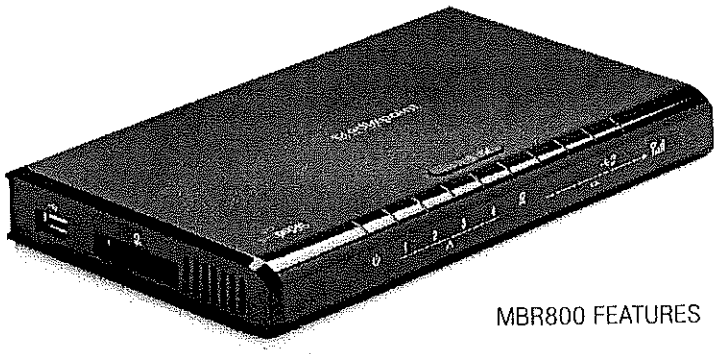
Using 3G/4G Instead of Wired Connections Provides Greater Flexibility



MBR800 Failover to 3G/4G

When Primary ISP Fails, the MBR800 Automatically Provides Service Without Interruption





MBR800 FEATURES

- **Mobile Broadband Primary Connection**
- **Failover/Failback to 3G/4G**
- **Easy Setup and Maintenance**
- **Works with USB or ExpressCard™ Modems**
- **Perfect for Kiosk and POS-type Applications**

* Requires Activated USB and/or ExpressCard Modem with a Mobile Broadband Carrier - Over 100 Modems and Handsets Supported.

** Based on Mobile Broadband Coverage

Latest modem compatibility available at **www.cradlepoint.com**

MBR800

Failsafe Mobile Broadband Router

SPECIFICATIONS

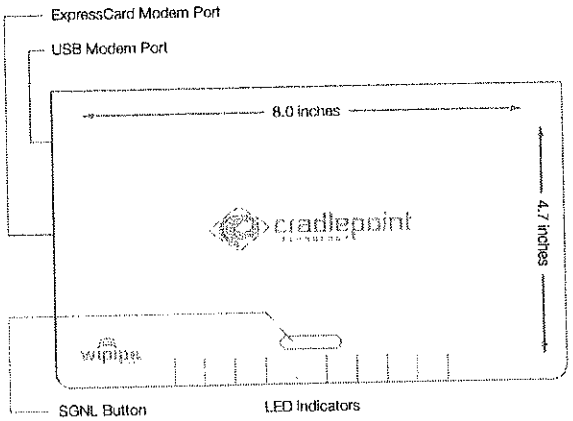
- MODEL NAME: MBR800 Mobile Broadband Router
- NETWORK CONNECTIONS AND PORTS: Four LAN, One WAN/Ethernet, Two USB Modem, One ExpressCard Modem
- WAN/LAN COMPATIBILITY: IEEE 802.3u Compliant
- BUTTONS/SWITCHES: SGNL (Signal Strength Display Mode), Reset
- LED INDICATORS: Power, LAN (1-4), WAN, MDM (Mobile Broadband Modem Active), SGNL
- POWER: 12VDC, 1.2A; 100-240V AC
- DIMENSIONS: 8-in x 4.7-in x 1.2-in (203mm x 120mm x 29mm)
- WEIGHT: 12 oz. (340g)
- TEMPERATURE: 0°C to 50°C (32°F to 120°F) Operating
-20°C to 70°C (-4°F to 158°F) Storage
- RELATIVE HUMIDITY: 10% - 85% Operating / 5% - 90% Storage
- CERTIFICATIONS: FCC Part 15 Class B, CE

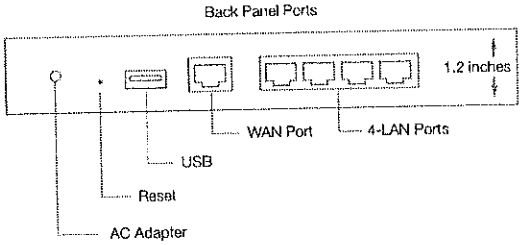
DETAILS

- Compliant with IEEE 802.3 and 3u Standards
- Supports Cable/DSL Modems with Dynamic IP, Static IP, PPPoE, PPTP, L2tp Connection Types
- Supports both USB and ExpressCard Mobile Broadband Modems
- Traffic Control with Virtual Server (max 32 Servers) and DMZ
- Compatible with HSPA and EVDO Mobile Broadband Devices
- Universal Plug & Play and ALGs Support for Internet Applications such as E-Mail, FTP, Gaming, Remote Desktop, Net Meeting, Telnet, and more
- Flash Memory for Firmware Upgrade, Save/Restore Settings
- Easy Local or Remote Management via HTTP, HTTPS, and SNMP
- Compliant with Windows 98SE/NT/200/XP/Server 2003/Linux/Mac OS

SECURITY

- Firewall features Network Address Translation (NAT) and Stateful Packet Inspection (SPI) which protects against DoS Attacks
- Security of Internet Access Control (Services
- Supports Multiple Concurrent IPSec, L2TP and PPTP VPN Pass-Through Sessions





MINIMUM REQUIREMENTS

Mobile Broadband USB or ExpressCard Data Modem with Active Subscription or Supported Phone with Active Tethered (Phone-as-Modem) Data Plan for 3G/4G Failover Capability, Internet Service Delivered via Cable DSL, T1

Management Interface Requires An Internet Browser: Internet Explorer v6.0, Firefox v2.0, or Safari v1.0 Minimum

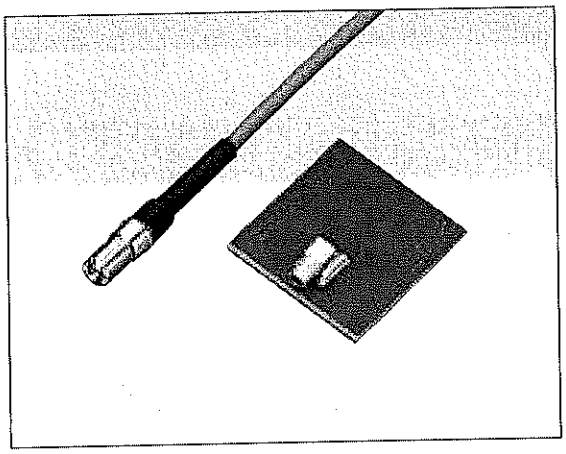
IN THE BOX

- MBR800 Failsafe Mobile Broadband Router
- 5-ft (1.5m) CAT5 Ethernet Cable
- Quick Start Guide
- AC Power Adapter
- Warranty Card

cradlepoint TECHNOLOGY 805 W. Franklin Street, Boise, Idaho 83702 (+1) 208.424.5054 www.cradlepoint.com

New

RF Coaxial Connector with Switch (SMT), TS-9 Series <3GHz>



Features

1. An externally connectable right angle coaxial connector with a SMT-ready switch (3.2 mm high).
2. A wide frequency coverage of DC up to 3 GHz with excellent frequency characteristics.
3. Half-locking mating mechanism with the plug, providing a good clicking sensation.
4. Enbossed tape packaged for convenient automatic mounting.
5. Patents pending.

Specifications

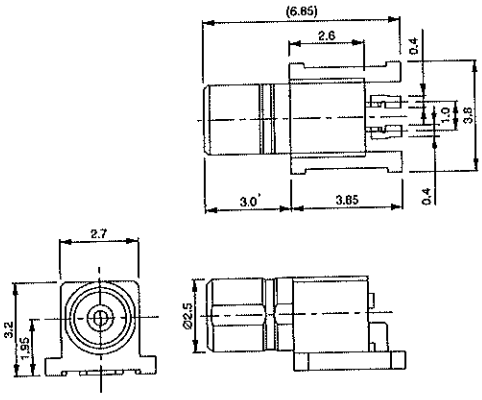
- Rating ·····100C AC/DC
- Operating Frequency Range ···DC to 3 GHz
- Nominal Impedance·····50Ω
- V. S. W. R.·····1.3max. (DC to 1 GHz), 1.5 max. (1 to 3 GHz)
- Insertion Loss ·····0.2 dB max. (DC to 1 GHz), 0.3 dB max. (1 to 3 GHz)
- Operating Temperature Range·····–25℃ to +85℃
- Mating Life·····5,000 cycles

Applications

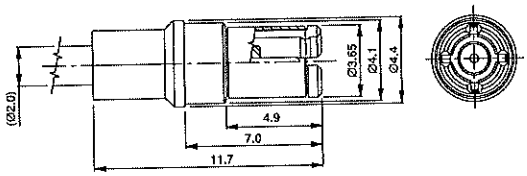
PC Card, Mobile phones, wireless LAN products, Bluetooth products, etc.

Dimensions

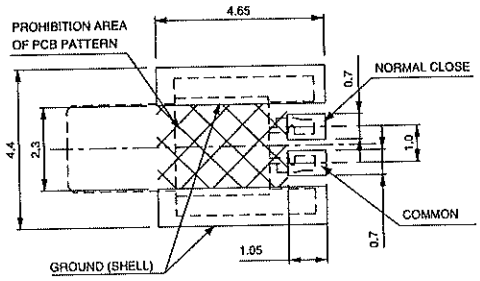
- Receptacle CRS5001-3702F



- Plug CRC9001-5301F



P. C. Board Dimension



Recommend PCB Footprint(S=10:1,±0.05)

⚠ CAUTION

- Specification is subject to change without prior notice for improving performance of the product and so on.
- Dimensions and specifications described herein are limited to major items. When applying the products, please confirm details in the drawing and spec sheets which will be provided upon request.
- Every product carried here is compliant to RoHS requirements. For detail, please refer to our sales representative.
  *RoHS Directive: An EU Directive for restriction of the use of certain hazardous substances in electrical and electronic equipment.

SMK CORPORATION
Please Contact Sales or Division,Sales Dpt.
No. 5-5, Togoshi 6-chome, Shinagawa-ku, Tokyo 142-8511, Japan
TEL 81-3-3785-1111 FAX 81-3-3785-1122
URL http : // www. smk. co. jp /

Represented By
CS Division, Sales Dpt.
TEL : 81-3-3785-1176 FAX : 81-3-3785-2904

2006-10CS
PRINTED IN JAPAN

INTERMATIC®

INSTALLATION INSTRUCTIONS

Model AG4803C
Secondary Surge Arrester

WARNING:

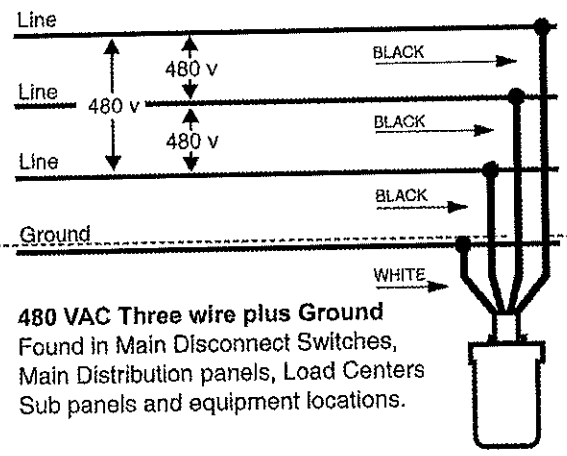
Intermatic Incorporated recommends that the AG series Secondary Surge Arresters be installed by a licensed electrician. Hazardous voltages may be present. AG series units are not intended to protect against direct lightning strikes.

MAINTENANCE:

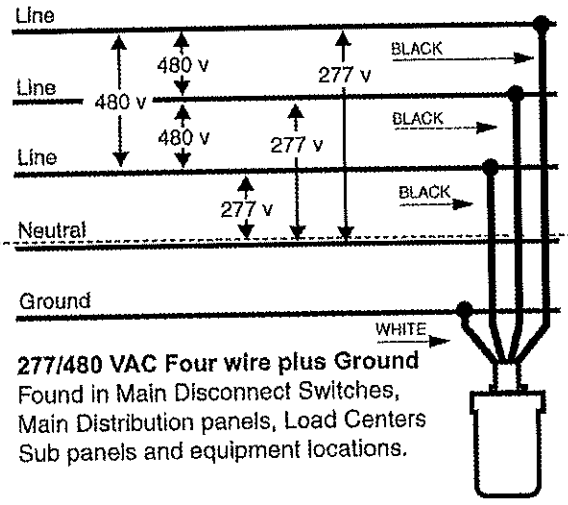
Inspect every 3 months for cracks in the housing or black soot coming out of nipple end. If either is observed, unit is no longer providing surge protection and should be replaced.

APPLICATION

This model is designed specifically for 480 VAC Delta and 277/480 VAC Wye three phase applications. If your application does not match one of the diagrams shown below, consult the information on the back of this sheet or call your supplier.



480 VAC Three wire plus Ground
Found in Main Disconnect Switches, Main Distribution panels, Load Centers Sub panels and equipment locations.



277/480 VAC Four wire plus Ground
Found in Main Disconnect Switches, Main Distribution panels, Load Centers Sub panels and equipment locations.

INTERMATIC INCORPORATED
http://www.intermatic.com
INTERMATIC PLAZA, SPRING GROVE, ILLINOIS 60081-9698

TWO YEAR LIMITED PRODUCT WARRANTY
For
INTERMATIC® SECONDARY SURGE ARRESTERS

(1) What Is Covered By This Limited Warranty

Repair or Replacement of Product

Intermatic Incorporated ("Intermatic") warrants to the original purchaser only, Intermatic models AG2401, AG2401C, AG2083C, AG2403C, AG4801, AG4803C, AG6503, AG6503C, AG6503L Secondary Surge Arresters (each a "Product") shall be free from defects in material or workmanship for a period of two years (24 months) from date of purchase or 30 months from date of manufacture. If the purchaser discovers a defect in material or workmanship, the purchaser must promptly submit a warranty claim. Upon a determination by Intermatic that the Product is defective, Intermatic, at its sole option, shall correct any defect in material or workmanship by either repairing or replacing the Defective Product at Intermatic's expense. The foregoing remedies are the purchaser's exclusive remedies for a breach of warranty. The Product must be installed in the appropriate application in complete accordance with the installation instructions. All building wiring and other connections to the Product must conform to all applicable national, state and local electrical codes; the Product must not be opened, modified, exposed to extreme heat or cold, submerged or subjected to abnormal use or service. All products must be used in accordance with the instructions provided with the Product and the purchaser shall be solely responsible for selecting a Product model with specifications appropriate for the equipment to be protected. Intermatic shall determine, in its sole discretion, whether any Product returned by a purchaser has been used in accordance with its instructions, is an appropriate model for the purchaser's use thereof, and whether the Product is defective.

(2) What Is Not Covered By This Warranty

Intermatic does not warrant (a) defects in the Product or damage to any equipment caused by the failure to properly install the Product, (b) damage caused by use of the Product for purposes other than those for which it was designed, (c) damage caused by disaster such as fire, flood and wind, (d) damage caused by unauthorized attachments or modification of the Product, (e) damage to the Product occurring during shipment, or (f) electrical disturbances exceeding published product specifications, (g) damage to the Product caused by any other abuse or misuse by the purchaser. This product is not designed to protect against Utility swells, loss, restoral or abnormal sustained overvoltage conditions.

(3) Disclaimer of Warranty

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER EXPRESSED WARRANTIES. TO THE EXTENT ALLOWED BY LAW, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE DURATION OF THIS LIMITED WARRANTY.

(4) Limitation of Remedies

IN NO CASE SHALL INTERMATIC BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES BASED UPON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT, OR ANY OTHER LEGAL THEORY. SUCH EXCLUDED DAMAGES INCLUDE, BUT ARE NOT LIMITED TO, DAMAGE TO SOFTWARE, LOSS OF DATA, LOSS OF PROFITS, LOSS OF SAVINGS OR REVENUE, LOSS OF USE OF THE PRODUCT OR ANY ASSOCIATED EQUIPMENT, COST OF CAPITAL, COST OF ANY SUBSTITUTE EQUIPMENT, FACILITIES OR SERVICES, DOWNTIME, THE CLAIMS OF THIRD PARTIES INCLUDING CUSTOMERS, DAMAGE TO PROPERTY AND PERSONAL INJURY. SOME STATES DO NOT ALLOW LIMITS ON WARRANTIES OR ON REMEDIES FOR BREACH IN CERTAIN TRANSACTIONS. IN SUCH STATES, THE LIMITS IN THIS PARAGRAPH AND IN PARAGRAPH (3) MAY NOT APPLY.

(5) Time Limit for Bringing Suit

No action arising out of any claimed breach of warranty may be brought more than one year after the cause of action has occurred.

(6) No Other Warranties

Unless modified in writing signed by both parties, this agreement is understood to be the complete and exclusive agreement between the parties, superseding all prior agreements, oral or written, and all other communications between the parties relating to the subject matter of this agreement. No employee of Intermatic or any other party is authorized to make any warranty in addition to those made in this agreement.

Performance Characteristics:

MODEL	SERVICE VOLTAGE	POLES	LEADS & LENGTH	WIRE CONFIGURATION	ACTUAL CLAMPING VOLTAGE (line to ground) 1,500 A	5,000 A	10,000 A
AG4803C ("C" indicates clamshell package)	480	3	4 - 18" 12 gauge	L1, L2, L3, GND/N	1450	2130	2620

Specifications:

TECHNOLOGY: Parallel Metal Oxide Varistors

CONFIGURATION: Each line to ground/neutral

MAXIMUM LINE VOLTAGE: 480 volts AC line to ground

ENCLOSURE: Weatherproof and UV resistant NEMA 4 molded polycarbonate with threaded metal nipple.

ENCAPSULATION: UL component recognized epoxy potting compound. UL Flame class 94V-0; Relative Temperature Index: Electric - 90, Mechanical - 90.

MOUNTING: 1/2" x 20 threaded nipple.

MOUNTING BRACKET: Right angle aluminum racket (Optional). Order **AG1BRKT**.

WIRING: 18" of 12 gauge stranded copper wire is preconnected for each phase, neutral and ground.

WIRE COLOR CODE: Black - phase leads, White - ground/neutral lead.

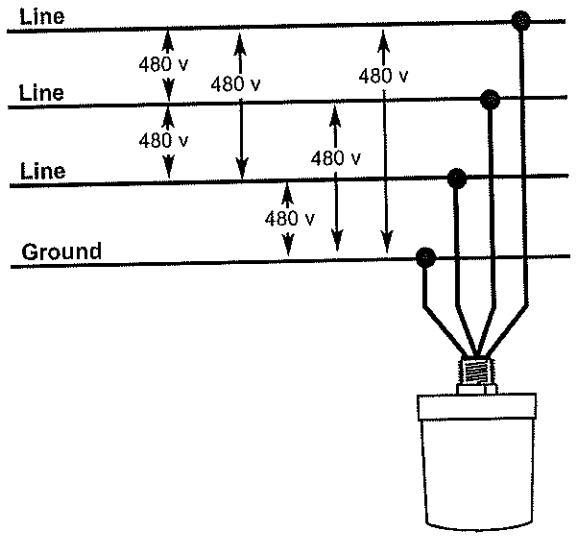
WEIGHT: 0.75pounds, 1.0 pounds in carton.

AGENCY LISTINGS:

cULus: OWHX - Listing No. 94X1

AMBIENT OPERATING TEMPERATURE: - 40 to + 85 °C (- 40 to + 185 °F).

Wiring Diagrams:



Suggested Specifications:

The Secondary Surge Arrester (commonly known as a lightning arrester) shall be listed by Underwriters Laboratories (OWHX), ANSI/IEEE C62.11 for Category 'C' locations. The arrester shall provide protection between each phase conductor and ground. The Maximum Continuous Operating Voltage (MCOV) shall be a minimum of 550 volts AC between phase and ground. The Secondary Surge Arrester shall employ parallel MOV's and provide protection from Category 'C' level transient surges as defined in ANSI/IEEE C62.11, C62.34, C62.41.1 and C62.41.2 without degradation of components.

The arrester housing shall be constructed of UV resistant polycarbonate or material of equal strength and UV resistance. All electrical connections shall be sealed in a UL component recognized epoxy to exclude moisture, dirt and corrosion. The encapsulation shall have a minimum UL Flame Class rating of 94V-0. A one-half inch threaded nipple and locknut shall be provided. Leads shall be a minimum of twelve gauge and eighteen inches in length.

When subjected to a 8 x 20 µS test impulse, the Peak Clamping Voltage shall be no greater than 490 volts for 1500 Amps, 980 volts for 5,000 Amps or 1,410 volts for 10,000 Amps (@ 4 x 10 µS).

The arrester shall carry a two year warranty and be manufactured by a company who has engaged in the manufacture of such products for a minimum of five years.

INTERMATIC®

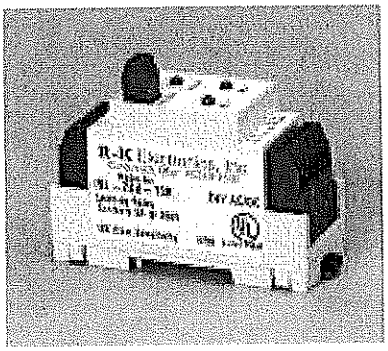
WARRANTY AND LIMITATION OF LIABILITY

If within two (2) years from the date of purchase, this Secondary Surge Arrester fails due to defect in material or workmanship, Intermatic Incorporated will repair or replace it free of charge. The warranty does not apply to: (a) damage caused by accident, abuse, mishandling, dropping; (b) units which have been subject to unauthorized repair, opened, taken apart; (c) units not used in accordance with directions. Some states do not allow a limitation of damages, so the foregoing limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary, from state to state. This warranty service is available by either (a) returning the product to the dealer from whom the unit was purchased, or (b) obtaining a Returned Authorization from the Intermatic Service Center at 815-675-7000. Contact the company or refer to the warranty sheet enclosed with each product for complete warranty details.

INTERMATIC INCORPORATED
SPRING GROVE, ILLINOIS 60081
www.intermatic.com

Latching Relay with Intrinsically Safe Outputs

ISL



Specifications

Electrical

Supply Voltage: 12 or 24 AC/DC ±10%
Power: 0.8 watts
Inputs: Switch Closure or Probe
Input Sensitivity: 10k - 100k Ω
Pick-up & Drop-out Delays: 1 second
Max. Open Circuit Voltage: 7 volts
Max. Source Current: 0.1 milliamps
Output Rating @ 25°C:
5 Amps @ 125VAC
5 Amps @ 30VDC or 250VAC
20,000,000 Mechanical Cycles

Physical

Mounting: Din Rail mount
Termination: Touch safe screw terminals, with lift mechanism, #12 AWG max.
Weight: 10 Oz.

Ambient Temperatures

Operating: 0°C to 55°C
Storage: -40°C to 85°C

UL-913
Class 1, Division 1
Groups A, B, C, and D
Hazardous Locations

- **Two Inputs - Latching Function**
- **Compact Design**
- **Contact or Probe Input**
- **Built-in De-bounce Delays**
- **Output and Input status LEDs**
- **Low Voltage Design for 12 or 24VAC/DC**
- **Din Mounting**
- **12 or 24VDC Battery Back-Up**

E199046
Standard UL 913

Ordering Information

ISL - 24V - 10K

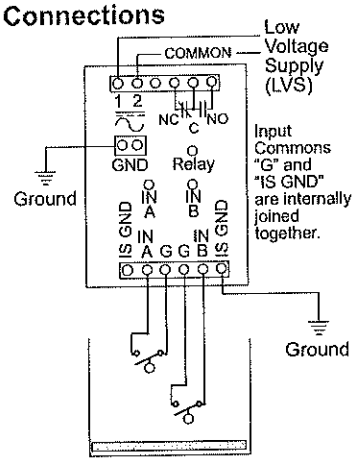
R-K Model

Operating Voltage
12V - 12VAC/DC
24V - 24VAC/DC

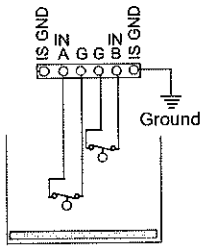
Sensitivity (Max. contact resistance)
10K - 10k Ω

(Consult factory for other sensitivity options.)

Connections



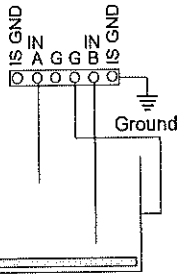
Pump Down Operation shown with Normally Open (NO) Float Switches



Pump Up Operation shown with Normally Closed (NC) Float Switches

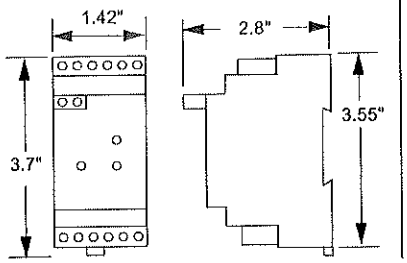
If Low Voltage Supply is grounded, the ground must be connected to terminal 2.

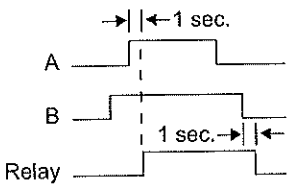
See control drawing A6757-4 for other input examples.



Pump Down Operation shown with Connectivity Probes

Dimensions





Operation

Latching Relay

The ISL has two independent outputs to the hazardous area and one (dry contact) relay output with a latching function. The outputs can be switches or, when used with a conductive liquid, electrodes. For pump down when output "A" is completed (contact closed or low resistance), 1 second later LED "A" turns On and the dry output contact is energized. When output "B" is completed (contact closed or low resistance), 1 second later LED "B" turns On and the dry output contact is unlatched and de-energized. For pump up applications use normally closed input devices and switch the position of "A" and "B."This device must be located and grounded in a non-hazardous location.

Installation of Relays with Intrinsically Safe Outputs

Installation of these relays should only be performed by personnel experienced with intrinsically safe devices. Proper wiring practices must be strictly adhered to in order to prevent injury to personnel and property damage due to explosion or fire.

IMPORTANT: BEFORE PROCEEDING TO INSTALL AND WIRE THE RELAY, READ AND THOROUGHLY UNDERSTAND THESE INSTRUCTIONS.

When installed according to the following instructions and Control Drawing A-6757-4 these Relays are for use in Class I, Division 1, Groups A, B, C, and D. The relay must be mounted in a suitable enclosure which is tool accessible and is situated in a non hazardous area where an explosive atmosphere will not exist at any time.

WIRING:

1. All intrinsically safe wiring should be installed in accordance with NEC NFPA 70 Article 504 and ISA RP 12.6

2. Electrical equipment connected to the non intrinsically safe side should not use or be capable of generating more than 250 volts with respect to earth.

3. Intrinsically safe wiring connecting to the relay must be kept separate from non-intrinsically safe wiring by means of physical barriers and wiring tie down devices to insure no contact.

4. The cabinet must have a proper earth ground and the relay must be grounded. At least one ground from the intrinsically safe side and the non intrinsically safe side of relay must be made using #12 AWG insulated conductors. The units redundant earth ground wires must be individually connected with metal screws and lockwashers to the cabinets earth ground. Resistance between the relay ground to the grounding electrode shall be less than one ohm.

5. Intrinsically safe connections must not be made to any energy generating device or device mounted inside a tank subjected to pressures greater than 15 psi without specific approval.

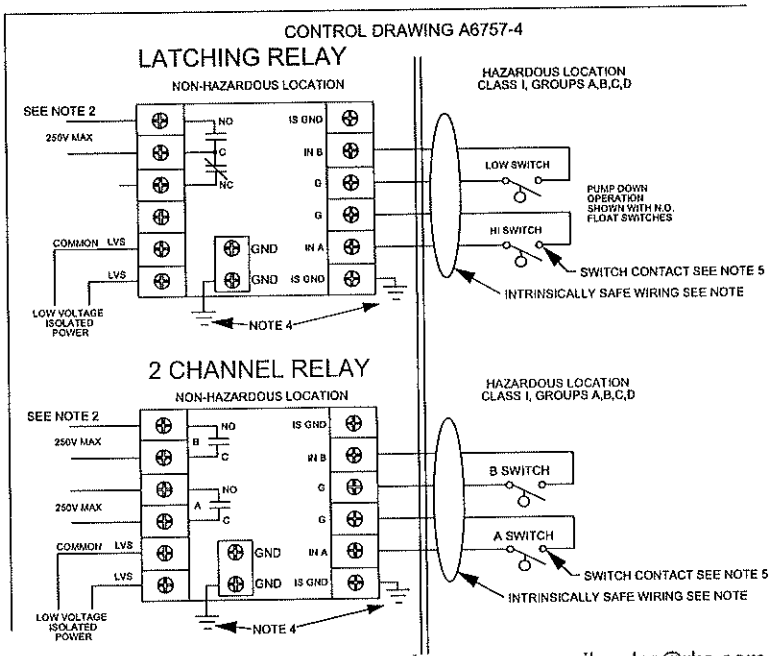
6. Maximum distance between the input of the relay and the switch is 1000 feet. Cable capacitance plus intrinsically safe equipment capacitance must be less than the marked capacitance (Ca) shown on any barrier used. The same applies for inductance. We recommend the use of 14 AWG type THHN wire without splices. In no case should the capacitance or inductance exceed the specified limits. If the characteristics of your wire are unknown the following values may be used.

   CAPACITANCE: 60 pf / ft
   INDUCTANCE: 0.20 µh / ft

7. This device may be used in a Division 2. Location if so approved.

8. Selected barriers must have Voc not exceeding Vmax and Isc not exceeding Imax as shown below. All barriers bust be of the same polarity.

   Entity parameters:
   Voc = 5.89 Volts
   Isc = 0.132 mA
   Ca = 0.45 µf
   La=500mH
   Voc ≤ Vmax
   Isc ≤ Imax
   Ca ≥ CI + Ccable
   La ≥ Li + Lcable



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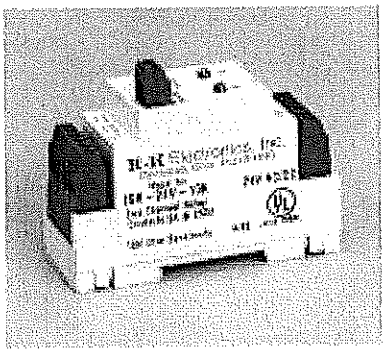
Two Channel Relay with Intrinsically Safe Outputs

ISR



Specifications

Electrical
Supply Voltage: 12 or 24 AC/DC ±10%
Power: 1.5 watts
Inputs: Switch Closure or Probe
Input Sensitivity: 10k - 100k Ω
Pick-up & Drop-out Delays: 0.5 second
Max. Open Circuit Voltage: 7 volts
Max. Source Current: 0.1 milliamps
Output Rating @ 25°C:
5 Amps @ 125VAC
5 Amps @ 30VDC or 250VAC
20,000,000 Mechanical Cycles

Physical
Mounting: Din Rail mount
Termination: Touch safe screw terminals, with lift mechanism, #12 AWG max.
Weight: 10 Oz.

Ambient Temperatures
Operating: 0°C to 55°C
Storage: -40°C to 85°C

UL-913
Class 1, Division 1
Groups A, B, C, and D
Hazardous Locations

- 2 Independent Relays
- Compact Design
- Contact or Probe Input
- Built-in De-bounce Delays
- Power and Output status LEDs
- Low Voltage Design for 12 or 24VAC/DC
- Din Mounting
- 12 or 24VDC Battery Back-Up

E199046
Standard UL 913

Ordering Information

ISR - 24V - 10K

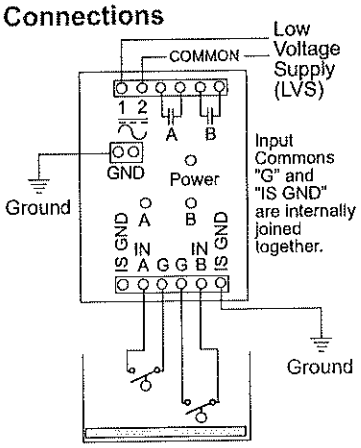
R-K Model

Sensitivity
10K - 10k Ω

(Consult factory for other sensitivity options.)

Operating Voltage
12V - 12VAC/DC
24V - 24VAC/DC

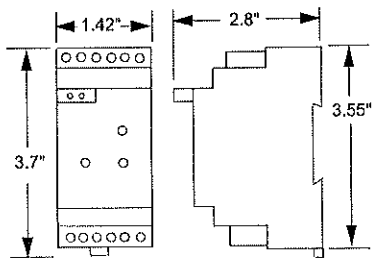
Connections

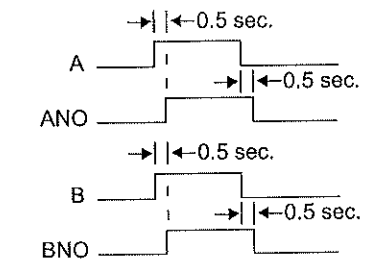


See control drawing A6757-4 for other input examples.

If Low Voltage Supply is grounded, the ground must be connected to terminal 2.

Dimensions





Operation

Two Channel Relay
The ISR has two independent outputs to the hazardous area and two independent (dry contact) relay outputs. The outputs to the hazardous area can be switches or, when used with a conductive liquid, electrodes. When output "A" is completed (contact closed or low resistance), 0.5 second later the dry output contact "A" is closed and the "A" LED turns On. When output "A" is opened (contact opened or high resistance), 0.5 second later the dry output contact "A" opens and the "A" LED turns Off. "B" operates the same way, but is independent of "A." There is also a supply power LED indicator. The ISR must be located and grounded in a non-hazardous location.

Installation of Relays with Intrinsically Safe Outputs

Installation of these relays should only be performed by personnel experienced with intrinsically safe devices. Proper wiring practices must be strictly adhered to in order to prevent injury to personnel and property damage due to explosion or fire.

IMPORTANT: BEFORE PROCEEDING TO INSTALL AND WIRE THE RELAY, READ AND THOROUGHLY UNDERSTAND THESE INSTRUCTIONS.

When installed according to the following instructions and Control Drawing A-6757-4 these Relays are for use in Class I, Division 1, Groups A, B, C, and D. The relay must be mounted in a suitable enclosure which is tool accessible and is situated in a non hazardous area where an explosive atmosphere will not exist at any time.

WIRING:

1. All intrinsically safe wiring should be installed in accordance with NEC NFPA 70 Article 504 and ISA RP 12.6

2. Electrical equipment connected to the non intrinsically safe side should not use or be capable of generating more than 250 volts with respect to earth.

3. Intrinsically safe wiring connecting to the relay must be kept separate from non-intrinsically safe wiring by means of physical barriers and wiring tie down devices to insure no contact.

4. The cabinet must have a proper earth ground and the relay must be grounded. At least one ground from the intrinsically safe side and the non intrinsically safe side of relay must be made using #12 AWG insulated conductors. The units redundant earth ground wires must be individually connected with metal screws and lockwashers to the cabinets earth ground. Resistance between the relay ground to the grounding electrode shall be less than one ohm.

5. Intrinsically safe connections must not be made to any energy generating device or device mounted inside a tank subjected to pressures greater than 15 psi without specific approval.

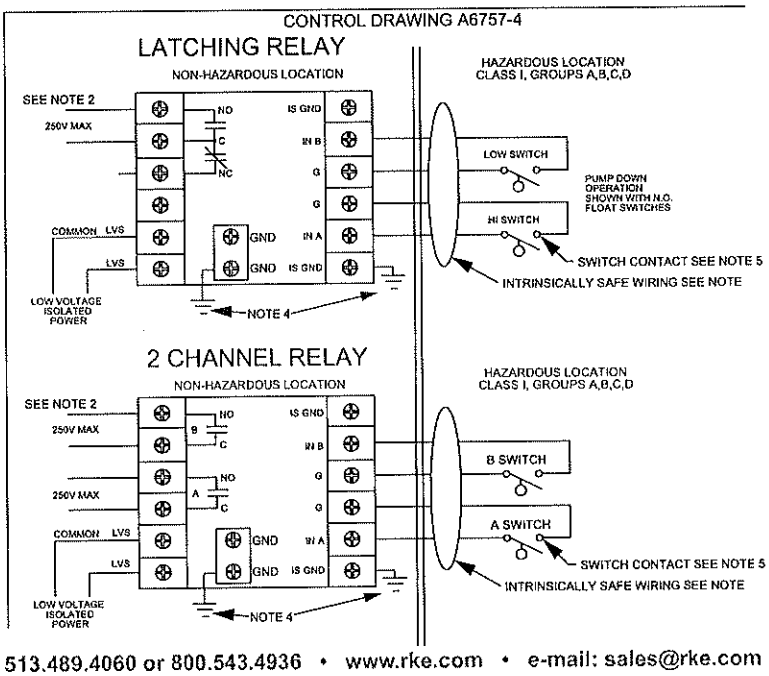
6. Maximum distance between the input of the relay and the switch is 1000 feet. Cable capacitance plus intrinsically safe equipment capacitance must be less than the marked capacitance (Ca) shown on any barrier used. The same applies for inductance. We recommend the use of 14 AWG type THHN wire without splices. In no case should the capacitance or inductance exceed the specified limits. If the characteristics of your wire are unknown the following values may be used.

   CAPACITANCE: 60 pf / ft
   INDUCTANCE: 0.20 µh / ft

7. This device may be used in a Division 2. Location if so approved.

8. Selected barriers must have Voc not exceeding Vmax and Isc not exceeding Imax as shown below. All barriers must be of the same polarity.

   Entity parameters:
   Voc = 5.89 Volts
   Isc = 0.132 mA
   Ca = 0.45 µf
   La=500mH
   Voc ≤ Vmax
   Isc ≤ Imax
   Ca ≥ Cl + Ccable
   La ≥ Li + Lcable



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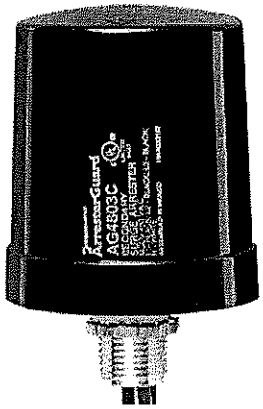
INTERMATIC®

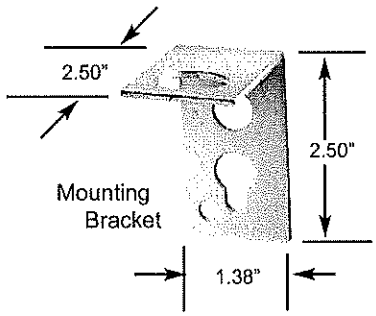
SECONDARY SURGE ARRESTER
"LIGHTNING ARRESTER"

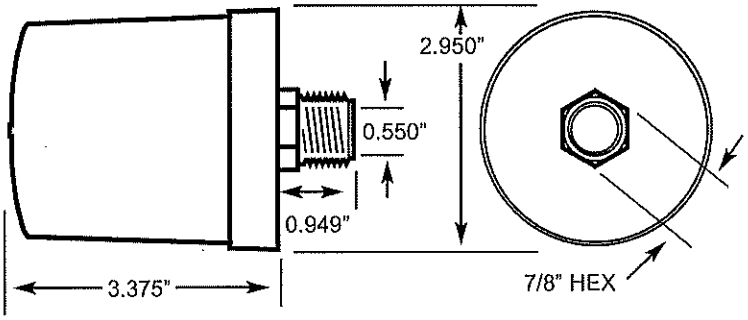
AG4803C

- For 480 VAC Three phase applications
  - May be used for all three phase applications
- For installation in Category "C", "B" and "A" locations
  - Service Entrance, branch panel and individual equipment applications
- Parallel installation
- Multi-Mode protection
  - Line - to - Ground
  - Line - to - Line
- NEMA 4 polycarbonate plastic enclosure
  - ½" nipple wire entry
  - UV resistant
- 18", 12-gauge color coded leads
- Mounting Bracket Option (AG1BRKT)
- UL Listed to Lightning Protective Device
  - OWHX - Listing Number 94X1
- CSA Certified
  - Listing Number LR38268
- Two year product warranty

C UL US
LISTED
OWHX
94X1







Features and Applications:

The **AG4803C** is a Metal Oxide Varistor (MOV) based hardwired Lightning Protective device that is UL listed as a Secondary Surge Arrester, Category **OWHX**. These devices, commonly called Lightning Arresters, have been tested according to the ANSI/IEEE Standards C62.11 and C62.34. Secondary Surge Arresters are designed to protect electrical equipment from the damaging effects of transient surges caused by lightning, utility switching, electric motor cycling, insulation arcing and various other large or sudden changes in electric current flow.

The AG4803C is a three phase, three-pole arrester designed to protect all three phase electrical systems up to 480 volts AC phase to ground. Installation of the arrester can be made indoors or outdoors. Secondary Surge Arresters may be installed at the meter can or on the service entrance. Installation is allowed on the line side or the load side of the main disconnect of the service. Arresters may also be installed at an individual piece of equipment.

The AG4803C housing is molded from weather and UV resistant polycarbonate which complies with the UL Standard for strength and flame resistance.

All electrical connections in the AG Series are imbedded in a UL recognized epoxy to seal and protect them from moisture and corrosion.

A partial list of applications that the AG Series is recommended for includes building electric service entrances, garages, street lights, traffic control lights and controllers, parking lot lights, electric motors for irrigation and farm applications,water and sewage lift stations.

Killark Electric Manufacturing Company
A Subsidiary of Hubbell Incorporated
3940 Dr. Martin Luther King Drive
St. Louis, MO 63113

INSTALLATION, OPERATION & MAINTENANCE DATA SHEET
TYPE "ENY" HORIZONTAL / VERTICAL SEALING FITTING

SUITABLE FOR CLASS I, DIV. 1 & 2, GROUPS A, B, C & D
AND CLASS II, DIV. 1 & 2, GROUPS E, F & G HAZARDOUS LOCATIONS.

Sealing fittings are installed in conduit runs to minimize the passage of gases, vapors, or flames from one portion of the electrical installation to another through the conduit, as well as to prevent precompression or "pressure-piling" of vapors or gases in conduit systems.

NOTE: Seals should be made only by experienced, careful persons in strict compliance with these instructions. Even slight variations can cause serious field problems. Read directions completely.

DIRECTIONS FOR INSTALLATION

① Using the drawings and chart at the right as a guide, install the sealing fitting into the conduit system. Refer to the National Electrical Code, Articles 501-5 and 502-5 for the regulations covering your specific application.

② Pull the conductors (wires) through the conduit system.

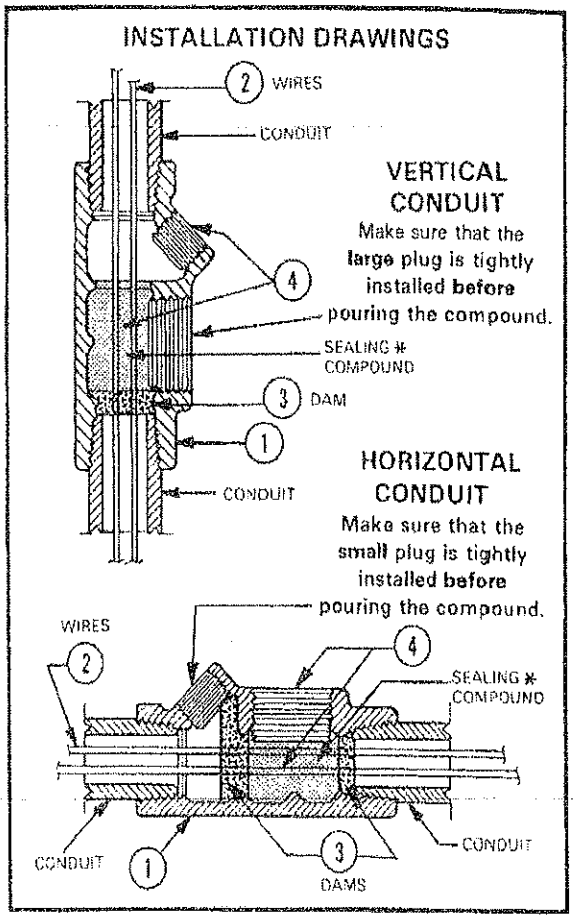
③ Using Killark Type "PF" Packing Fiber, build a dam at each conduit hub (except upper hubs in vertical seals.) Use a wooden stick to force the wires apart, and pack the fiber tightly around all wires. The dam must be tight and strong enough to keep the liquid sealing compound from leaking out before it sets up. The completed dam should be even with the conduit stop.

④ Use ONLY Killark Type "SC" Sealing Compound with these fittings. The sealing compound is mixed with water at the rate of three (3) parts of sealing compound to one (1) part of water by volume. See chart to determine the amount of compound required for a specific fitting. Use a clean mixing vessel for each batch. Sprinkle the sealing compound into the water while stirring, until a thick paste is formed. Continue mixing for **AT LEAST THREE (3) MINUTES.** The proper consistency is just fluid enough to pour **SLOWLY**, like thick gravy, from an inverted container, **NOT WATERY.** Do not mix more material than can be poured in 15 minutes. Discard any material that becomes too stiff to use. Never attempt to restore workability by stirring in more water.

After the compound is mixed, slowly pour it into the sealing fitting to the required level. Make sure that the wires are well separated, so the compound completely surrounds them. Pour slowly to avoid trapping air bubbles in the compound. Immediately wipe any spilled compound from conduits and threads, and close the fitting with the close-up plug. Make sure the plugs are tight.

⑤ Initial set of the sealing compound will occur within thirty (30) minutes. However, the compound requires a minimum of 8 hours above 32° F to develop sufficient strength to withstand explosion pressures.

INSTALLATION DRAWINGS



*NOTE: These fittings are approved for use **only** with Killark "SC" Sealing Compound.

CAT. NO.	CONDUIT SIZE	MIN. POUR DEPTH	APPROX. AMOUNT MIXED COMPOUND REQ'D. (OZ.)
ENY-1	½"	⅝"	1.0
ENY-2	¾"	¾"	1.5
ENY-3	1"	1"	2.5
ENY-4	1¼"	1¼"	5.5
ENY-5	1½"	1½"	7.5
ENY-6	2"	2"	10.5

OPERATIONAL DATA

In humid atmospheres or wet locations, where it is likely that water could enter the interior enclosures or conduit runs, or where temperature and/or barometric changes can produce condensation or moisture within the conduit system, raceways should be inclined so that the water will not collect in seals. It is recommended that Killark "EYD" draining seals be utilized to properly drain the system.

MAINTENANCE DATA

ENY sealing fittings require no special maintenance, other than a periodic inspection to be sure the close-up plugs are tight. In the event that a sealing fitting would be subjected to damage, the damaged parts should be replaced immediately to ensure the safety of the conduit system. Refer to the parts drawing at the right for replacement parts.

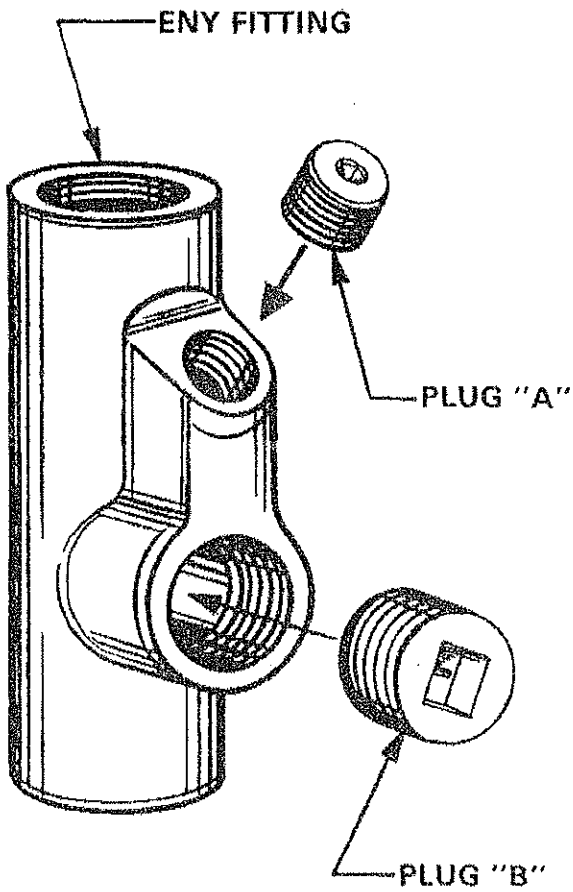
MAINTENANCE MANAGER: Please record the following information for your records:

COMPLETE CATALOG NO. _____
(As shown on package)

DATE OF INSTALLATION _____

REMEMBER TO SAVE A COPY OF THIS INFORMATION FOR MAINTENANCE PERSONNEL.

PARTS DRAWING



NOTE: THE CLOSE-UP PLUGS MAY BE ORDERED SEPARATELY, BUT, ARE INCLUDED WHEN THE FITTING IS ORDERED.

ALUMINUM FITTING CAT. NO.	PLUG "A" CAT. NO.	PLUG "B" CAT. NO.
ENY-1	CUP-250	CUP-2
ENY-2	CUP-375	CUP-2
ENY-3	CUP-375	CUP-3
ENY-4	CUP-1	CUP-4
ENY-5	CUP-1	CUP-5
ENY-6	CUP-2	CUP-6
IRON FITTING CAT. NO.		
ENY-1M	19861AAAB	PLUG 2
ENY-2M	19862AAAB	PLUG 2
ENY-3M	19862AAAB	PLUG 3
ENY-4M	PLUG 1	PLUG 4
ENY-5M	PLUG 1	PLUG 5
ENY-6M	PLUG 2	PLUG 6