

ARGUS<sup>®</sup>

# CS14 Switched Mode DC to DC Converter

012-014-B2



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# *Power*

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# **CS14**

## **DC to DC Switched Mode Converter**

012-014-B2

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

- **Specifications, CS14:** 012-014-B1
- **Important Safety Instructions**
- **Warranty Policy:** 048-507-10
- **Installation and Operation Instructions:** 012-011-C0
- **Outline Drawing:** 012-011-06
- **Factory Service Information:** 048-527-10

## SPECIFICATIONS FOR ARGUS TECHNOLOGIES' SWITCH MODE DC-DC CONVERTER MODEL CS14

### Output:

Voltage	11 - 14 VDC
Current	20 Amps D.C.
Power	280 Watts Continuous
Regulation	+/- .1% Line and load (static) <2% deviation for 50 to 100% load step (dynamic)
Time Stability	.1% per year
Temp. Stability	<100ppm/degree C over the operating range
Response Time	2 msec. to .1% of output for 50 to 100 % load step
Noise	Less than 22 dbrnc (Voice Band) <150mv p-p to 100MHZ (Wide Band) <10mv RMS to 10MHZ

### Input:

Voltage	40 - 60 VDC
Current	6.75A @ 52.0 VDC
Efficiency	80% min. 40-100% load (with paralleling diode)
Soft Start	3 - 5 seconds
Breaker Rating	10 Amp, 5,000 amp interrupting capacity at 65 VDC

### Miscellaneous:

Acoustic Noise	45 dBA at three feet
Weight	13.5 lbs (6.1 kg)
Size	3.5"H x 17"W x 12" (8.9cm H x 43.2cm W x 30.5cm D)

**Recommended Connection Wire Sizes (as per UL) :**

Ambient Temp=30 deg C      Input: #14 AWG  
   Output: #12 AWG

Ambient Temp=50 deg C      Input: #14 AWG  
   Output: #10 AWG

**Environmental:**

Temperature                      0 to 50 deg. C [operating] (32 to 122 deg. F )  
   -40 to +70 deg. C [storage] (-40 to +158 deg. F)

Humidity                            0 to 90 % non-condensing

Elevation                           -500 to +2800 m Above Sea Level  
   (Derate Max. Ambient to +40 linearly at 3100 m)

# **IMPORTANT SAFETY INSTRUCTIONS**

## **SAVE THESE INSTRUCTIONS**

**This manual contains important safety and operating instructions for  
CS-11, 12, 13, 14 series of DC to DC Converter.**

- 1. Before using this converter, read all instructions and cautionary markings on the converter.**
- 2. CAUTION - This unit may contain high voltage, stored energy at any time. Do not open front cover without removing input power. Allow one minute before opening the front cover. Refer all service or adjustments to qualified personnel.**
- 3. Do not expose the unit to rain or snow.**
- 4. Use of an attachment not recommended or sold by the converter manufacturer may result in a risk of fire, electric shock, or personal injury.**
- 5. Do not operate the converter if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified service center.**
- 6. Do not disassemble the converter; take it to a qualified service center when service or repair is required. Incorrect reassembly may result in a risk of electrical shock or fire.**

# Installation and Operator's Manual for CS series of Switched Mode D.C. to D.C. Converters

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# 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 OEM materials (example: air conditioners, batteries), for a period of two years from the date of shipment from the factory. For third party products the OEM's warranty shall apply. 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.  
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## **2.0 Documentation - Part number information**

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### **2.1 Introduction**

Please read this manual thoroughly prior to use in order to become familiar with the unit's numerous features and operating procedures. To obtain a maximum degree of safety, follow the prescribed sequences as outlined.

This manual incorporates warnings and notes to the user. Points that are vital to the proper operation or safety of the operator are indicated by the heading; **WARNING**. Points that are important to the performance or ease of use of the equipment are covered by a notation that is underlined.

### **2.2 ARGUS 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; i.e.:

- 05 - Schematic
- 06 - Outline Drawing
- 20 - Bill of Material

ARGUS Technologies uses a 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 are not listed in this manual.

## **3.0 General**

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### **3.1 Scope**

This instruction manual covers the installation, operation and troubleshooting of Argus Technologies' CS-11, 12, 13, 14 series of switched mode DC to DC converter.

### **3.2 Introduction**

The CS-11, 12, 13, 14 series of DC to DC converters employ a high frequency switched mode conversion technique to provide a fully regulated and isolated DC output from the DC input. The converter input or output can therefore be used in either positive or negative ground systems as selected by the appropriate list option.

### **3.3 Features**

- 3.3.01 Analog Voltmeter/Ammeter
- 3.3.02 Indicators
- 3.3.03 Power On Indicator
- 3.3.04 Converter Fail Alarm
- 3.3.05 Over Voltage Shutdown
- 3.3.06 Current Limit
- 3.3.07 Soft Start
- 3.3.08 Output Slope
- 3.3.09 Input Circuit breaker
- 3.3.10 Low Input Voltage shutdown
- 3.3.11 Front to Back Ventilation
- 3.3.12 Paralleling
- 3.3.13 Test Jacks
- 3.3.14 Input Capacitor Pre-charge

#### **3.3.01 Analog Voltmeter/Ammeter (Optional)**

Located on the front panel of the unit is a 3 " combination voltmeter/ammeter. Normally, the display indicates the output current of the converter. Located beside the meter is a push button labelled "Depress to display Volts". When this button is held down the display will indicate the output voltage of the unit. Current and voltage readings are accurate to within two percent. Sensing for the meter is before the paralleling diode (if supplied) of the unit.

#### **3.3.02 Indicators**

The indicators provide visual indication of operational status and alarms. The indicators and associated colors are:

Power On	Green
Converter Fail	Red
O.V.P. Trip	Red

#### **3.3.03 Power On Indicator**

When input power is present and the DC input circuit breaker is placed in the "on" position the indicator will light. The indicator will not illuminate if the DC input is removed.

### **3.3.04 Converter Fail Alarm**

The unit's is equipped with a "Converter Fail" alarm which is also extended via two "form C" contacts for remote monitoring. Visual indication of the alarm is active during all modes or operation. Converter fail alarm discrimination circuitry is factory set. The alarm is in 'real time' and therefore does not latch. The alarm contacts are also "fail safe" and therefore will extend an alarm without a source of DC voltage being present, however, the indicators will not remain illuminated unless there is input power available. The alarm will be extended if the voltage or current regulation of the unit is not within factory set limits or if the internal reference fails. If the unit returns to regulation the alarm will clear.

### **3.3.05 Over voltage shutdown**

The over voltage protection feature electronically shuts down the converter when a high voltage condition on the output of the converter is identified. Shutdown indication is provided by a front panel LED. The level of the high voltage shutdown condition is factory set. This feature provides protection to the load from an over voltage condition from the converter. The over voltage shutdown feature of the converter is selective if the paralleling diode option is installed. This provides the ability to isolate and shutdown a malfunctioning unit amongst a group of units operating in parallel. Sensing for the circuit is before the paralleling diode if so equipped.

### **3.3.06 Current Limit**

The current limit circuit of the CS converter provides primary response to output overcurrent situations. The level is factory set at nominally 110% of rated output. When the output current reaches the preset level, the output voltage will decrease thereby limiting the output current of the unit. Indication of the condition will be apparent on the output meter and could result in a converter fail alarm if the output voltage decreases beyond limits.

### **3.3.07 Soft Start**

To eliminate a rapid increase in input current when the input breaker is "closed", this unit employs a soft start feature. This feature is sometimes referred to a "Current Walk-in". The output of the converter is gradually ramped up from zero amps to the load requirement. This ramping (33% per second) is accomplished by current limiting the output.

### **3.3.08 Output Slope**

CS converters use "output slope" or "regulation offset" to accomplish load sharing. When the converters are run in parallel it is necessary to adjust the units to track to each other or share the load over the output current range of the units. Output slope adjustment alters the regulation curve of the converter. The output slope adjustment control adjusts the regulation of the converter beyond its preset factory setting of 0.0%

### **3.3.09 Input Circuit Breaker**

Every unit is equipped with a magnetic circuit breakers on this input. Excessive current passing through the breaker will result in the breaker releasing to the tripped (reset) position. The breaker must be manually reset to turn the unit back on. The breaker can be located in either the positive or negative lugs on the input of the converter depending on the option selected.

**WARNING: This unit does not have an output circuit breaker/fuse. Do not connect to a battery load without using external protection.**

### **3.3.10 Low Voltage Shutdown**

The unit is electronically protected from low voltages to the input by fault detection circuitry. If the input to the converter falls below the lower DC input limit (see specifications), the unit will shutdown. The converter will resume normal operation immediately upon restoration of normal input conditions.

### **3.3.11 Front to Back Ventilation**

Cooling of the unit is achieved via front to back & top convection cooling. Cool air is drawn in via the grill in the front of the unit. The majority of the airflow is directed towards the rear of the unit and over the heatsinks. Some of the air flow is drawn up through openings in the main power circuit board, into transformers and around filter capacitors. The airflow exits via the ventilation holes in the top of the unit. To maintain proper operation allow one rack space between units. Heat baffles are not required.

### **3.3.12 Paralleling**

The unit will share current with other converters in a multi-converter application. The output slope is used to track the output of other units. The units incorporate paralleling/isolating diodes which will isolate a unit from the load in the unlikely event of a output component short.

### **3.3.13 Test Jacks**

The test jacks located on the front panel monitor the voltage at the output terminals. Impedance protection of the jacks is provided to safeguard the converter and operator in unlikely event that the meter leads are shorted. The jacks will accept probes of 0.08" diameter. External voltmeters should have a minimum input impedance of 10 Mega ohms.

### **3.3.14 Input Capacitor Pre-charge**

To prevent damage to the input capacitor and related input circuitry from high initial in-rush currents, a pre-charge circuit has been used. If the circuit was not provided, arcing and input surges would affect the life of the unit. During normal installation the input cables are connected with the input breaker "open". Once the input is connected to the source supply, the capacitors are charged via a limiting resistor. When the input breaker is "closed" the limiting resistor is bypassed and the unit becomes operational.

**WARNING: The input section of the unit may be charged even with the input circuit breaker in the "off" position.**

### **3.3.15 Battery Load**

**WARNING: The outputs of these units are not designed to be connected to a battery load. The use of external fuse(s) or circuit breaker(s) in the ungrounded lead(s) is required if a battery is connected across the load.**

## 4.0 **INSTALLATION INSTRUCTIONS**

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### 4.1 **Tools/Equipment Required**

Phillips screw driver (3/16" Tip)  
Phillips screw driver (1/4" Tip)  
Slotted screw driver (1/4" Blade)  
Slotted screw driver (1/8" Blade)  
Slotted screw driver {tweaker} (.09" x .02" Blade)  
4 1/2 Digit Digital Voltmeter  
Adjustable resistive load 24/48 volts

### 4.2 **Inspection**

All Argus products are shipped in rugged, double walled boxes, and are "foamed in place" to minimize shock that may occur during transporting. Packaging assemblies and methods are tested to National Safe Transit Association standards.

Prior to uncrating, note any damage to the shipping container. Uncrate the converter and inspect the exterior. If any damage is observed, contact the carrier immediately.

Open the front panel of the unit and continue the inspection for any internal damage. In the unlikely event of internal damage do not operate the unit until Argus Technologies has been contacted for advice on the impact of any damage.

### 4.3 **Preparation/Mounting**

The unit has been designed for mounting in a 19" or 23" EIA standard relay rack. Mounting brackets are for 1" or 1 3/4" spacing (depending on the option selected) plus reversible for 19" or 23" mounting configurations. Individual units shipped from the factory are arranged for 19" mounting. To adapt to 23" mounting, remove the four attaching screws, then flip the brackets so that the large flange is against the converter chassis and re-attach with mounting screws. The brackets may also be relocated for flush mounting of the unit in a rack. To flush mount the unit, 19" or 23" orientation should first be selected, then the brackets should be moved to the front mounting position from the mid mounting arrangement (factory arrangement).

As indicated by the front panel labeling, the unit must be mounted in a clean and dry environment. Sufficient access to an uninterrupted air source must also be allowed for. Allow at least four inches of free space in front and three to four inches behind the unit for ease of access and airflow. When installed in a relay rack, one extra rack space must be left between units to provide optimum airflow.

The unit should be mounted to the rack using two #12 -24 x 1/2" screws in each bracket. A captive type of drive such as Phillips head is preferred to eliminate the possibility of slippage and scratching of the unit's exterior.

### 4.4 **Input Connections**

#### 4.4.1 **DC Connections**

**WARNING:** Ensure that the input breaker is in the "off" position prior to any work being performed on the input or output connections.

#### 4.4.1.1

It is recommended for ease of service that each unit have a dedicated input feeder protection breaker or fuse. If it is preferred that the input breaker of the converter trips before the feeder protection breaker, the feeder breaker should have the next higher rating from the converter's DC input breaker. See specifications for input feeder breaker ratings (if used) and input wire gauges.

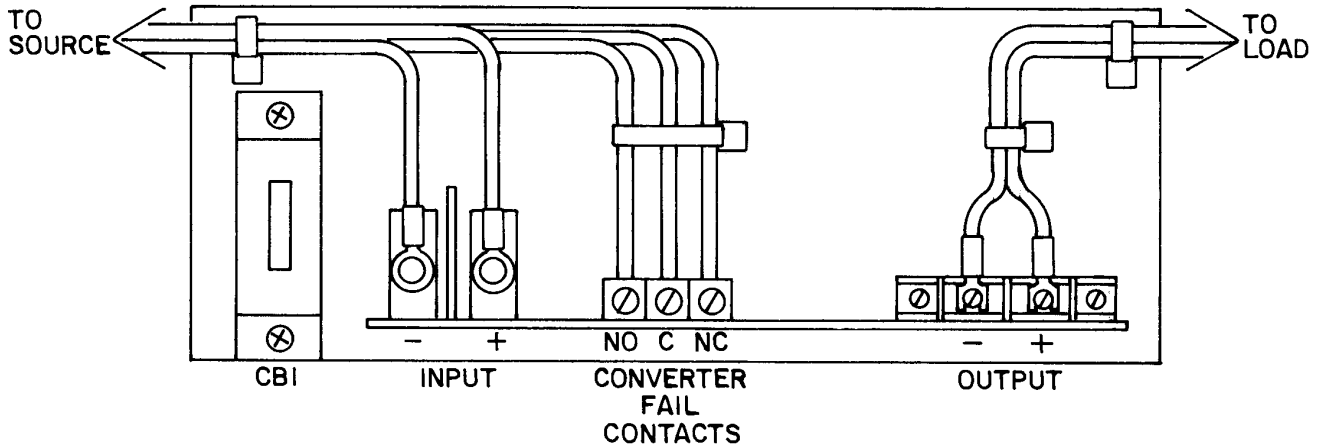


Figure 1 - Unit Connections

**Input wires should be tightly bundled and routed as far away as possible from the power PCB to minimize EMI pickup on the DC feed wires.**

Select either rear or front entry of the cables and swap the blank plate with the entry hole if necessary. The edges of the entry hole should be protected with an edge strip or bushing to protect the cables.

Insert the input cables through the hole as per figure #1. Drop down the front panel and pull the input cable assembly through the entry hole. The input cables and alarm cables should be bundled together and routed as per figure #1.

**WARNING: Observe the correct polarity of input cables.**

#### 4.4.1.2

Secure the cables to the input post of the correct polarity. Install the washers and nuts on top of the lugs in the same order in which they were shipped from the factory.

**WARNING: Over tightening of the post nuts may result in damage to the input bracket.**

## 4.5      Output Connections

**WARNING:** Ensure input breaker is “OFF” before attempting work on the output cable assembly. When the unit is connected to another operating converter the output leads must be suitably taped to prevent contact with the unit or each other.

**WARNING:** If power is present at the input terminals (even with the input breaker in the “off” position), some areas of the PCB will have stored energy present. Exercise caution, even with the input breaker “off”, when inserting output or alarm cables into the enclosure. If possible remove input power until the cables are secured.

### 4.5.1

The DC output wire should be UL approved file #B64801 XHHW, or RHH/RHW (Canadian RW90). See specifications for recommended output wire gauges. Select either rear or front entry of the cables and swap the blank plate with the holed plate if necessary. Feed the cable assembly through the hole in the unit. The output cables and alarm wires should be secured and routed as per figure #1.

Wires should be tightly bundled and routed as far from the power PCB as possible to minimize EMI pickup.

### 4.5.2

**WARNING:** Observe the correct polarity of output cables when terminating.

Secure the output cables to the output terminal of the same polarity.

**WARNING:** Over tightening of the terminal screws may result in damage to the output terminal.

### 4.5.3

Close and secure the front panel in preparation for normal operation.

### 4.5.4

Connect the output cable to the load or to the appropriate output termination bars.

## 4.6      Initial Start-up

**WARNING:** The input breaker should be “off” prior to application of input power.

To set all adjustments the use of a small pocket screw driver or tweaker is recommended.

For all controls, to increase a level, the corresponding adjustment control is rotated clockwise. To decrease a level the corresponding adjustment control is rotated counter-clockwise.

#### **4.6.1 Input Start-up**

Apply input power via the feeder breaker or fuse if used, ensure that the converter fail LED is illuminated otherwise incorrect polarity may be present.

**WARNING: Do not proceed if the “Converter Fail” indicator is not illuminated. See trouble shooting section.**

Place the converter’s input breaker in the “on” position. The “power on” and “converter fail” indicators should be lit. The converter will enter soft start and reach maximum output within 3-5 seconds. The converter fail indicator should go out as the unit reaches maximum output.

#### **4.6.2 Output Adjustment**

##### **4.6.2.1**

The “power on” indicator should be the only indicator lit. If not, refer to the trouble shooting section of this manual.

Depress the voltmeter display button and observe the output voltage. The output voltage on the meter will be approximately one volt higher than the desired reading if paralleling diode compensation is built into the converter. If this is not the desired “no load” voltage, re-adjust the level using a tweaker or small screw driver to the preferred level. The output voltage may be monitored via the panel meter.

If the unit is connected in parallel with an operating unit then adjust the output voltage control until the front panel meter reads approximately 1 volt higher than the meter monitoring the test jacks.

##### **4.6.2.2**

If the desired output voltage (test jacks) is not as required, fine tune alternately between the units until the desired output voltage is reached and the units are roughly sharing the load.

##### **4.6.2.3**

As the units are shipped with the slope control set at zero, the load sharing cross-over point will be delicate. Apply a small amount of slope (1/4 turn) if the units will not share easily. Final adjustments should not be made until the unit has reached operating temperature (approximately 1 hour). Refer to the adjustment section after the unit is at operating temperature.



CS - 11  
12  
13  
14

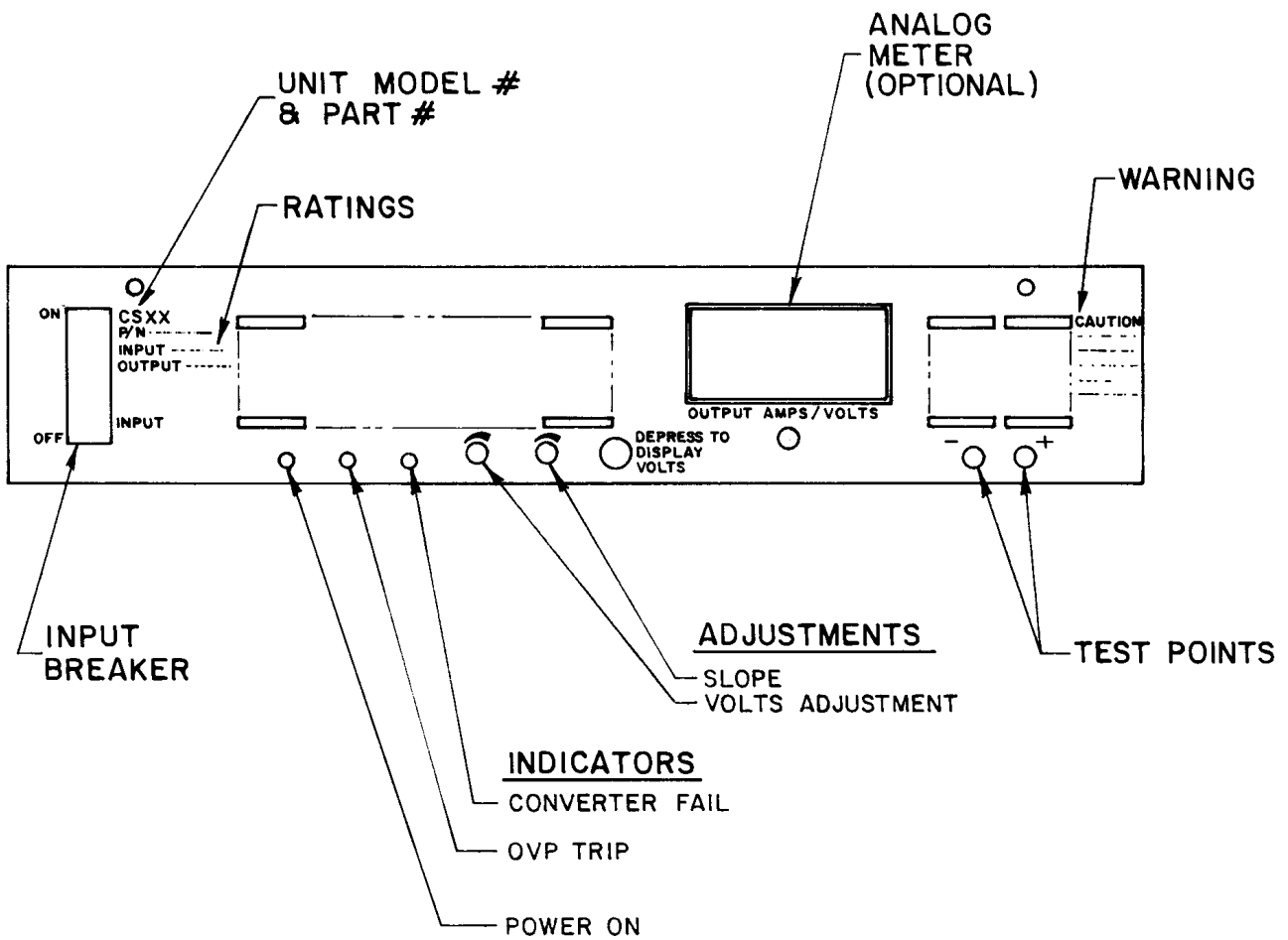


Figure 2 - Front Panel Layout

## **5.0 Operation**

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### **5.1 Shutdown**

The unit may be shut down by turning the input breaker “off” in any sequence. Voltage is stored in the input section of the unit even with the input breaker off.

### **5.2 Start-up**

To start the unit after a repair or for the first time the procedure as outlined in the initial start-up section of this manual should be followed. Apply power to unit, assure that the converter fail LED is on, close input breaker.

### **5.3 Normal Mode**

Normal operation of the converter will be indicated by the power on indicator being illuminated and by the absence of the converter fail indication. The panel meter will be indicating the output current and when the display mode select control is depressed the display will indicate the output voltage level.

## 6.0 Adjustments

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### 6.1 Factory Settings/Ranges

#### 48 Volt output

<u>Function</u>	<u>Range</u>	<u>Factory setting</u>
Output Voltage	44-52 VDC	52.0 VDC
Over Voltage Trip*	_____	56.0 VDC
Output Slope	0-2%	0%
Current Limit	_____	110%

#### 24 Volt output

<u>Function</u>	<u>Range</u>	<u>Factory setting</u>
Output Voltage	22-26.0 VDC	26.0 VDC
Over Voltage Trip*	_____	28.0 VDC
Output Slope	0-2%	0%
Current Limit	_____	110%

#### 12 Volt output

<u>Function</u>	<u>Range</u>	<u>Factory setting</u>
Output Voltage	11-14.0 VDC	14.0 VDC
Over Voltage Trip*	_____	15.5 VDC
Output Slope	0-2%	0%
Current Limit	_____	110%

\* Setting is measured before the paralleling diode (if installed).

To adjust all settings the use of a small pocket screw driver or tweaker is recommended.

For all controls, to increase a particular level the corresponding adjustment control is rotated clockwise. To decrease a level the corresponding adjustment control is rotated counter-clockwise.

## **6.2** Output Voltage

Voltage setting should be done using the external meter at the test jacks.

### **6.2.1**

With the output of the unit connected to the load, observe the panel meter and adjust the output level via the voltage control potentiometer. This may be done at any load. Accuracy of this setting will be +/-2% and approximately 1 volt high if paralleling diode is installed. If greater accuracy is required an external meter should be used "fine tune" the setting. Adjust the control as required.

The level should not be adjusted when the converter is in current limit. When in current limit increasing the level will not affect output voltage.

## **6.3** Output Slope/Parallel Operation

In order for a CS converter to regulate and track with other units in a multiple converter arrangement, the output slope must be adjusted. First each unit must have its slope set to zero (full counter clockwise) and then the units must be fine tuned to track accurately with other units. In our example we will use a slope of 1%. This means that from no load to full load the output float voltage will deviate 1%. The slope adjustment procedure should be carried out as quickly as possible to maintain accuracy of adjustments. Units should not be allowed to cool down while carrying out this adjustment.

### **6.3.1**

The output voltages should already be set to approximately the same level. If not already at zero adjust the slope control for zero slope. Turn all other paralleled units' "off". Adjust the output voltage on the remaining unit to 1% higher than the desired operating voltage.

### **6.3.2**

Adjust the slope control until the output is at the desired level. Close the input breaker of the second unit and then open the input breaker of the unit that has just been adjusted.

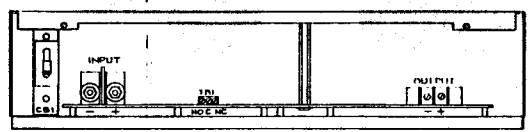
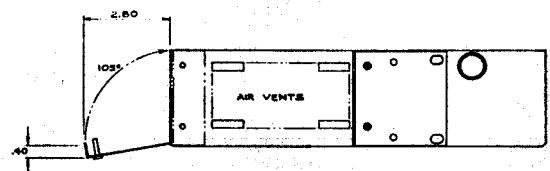
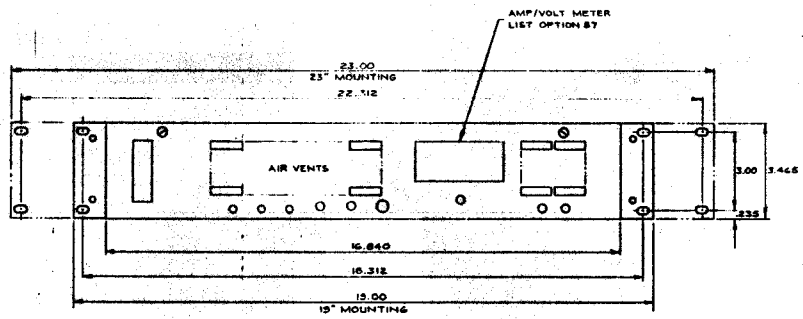
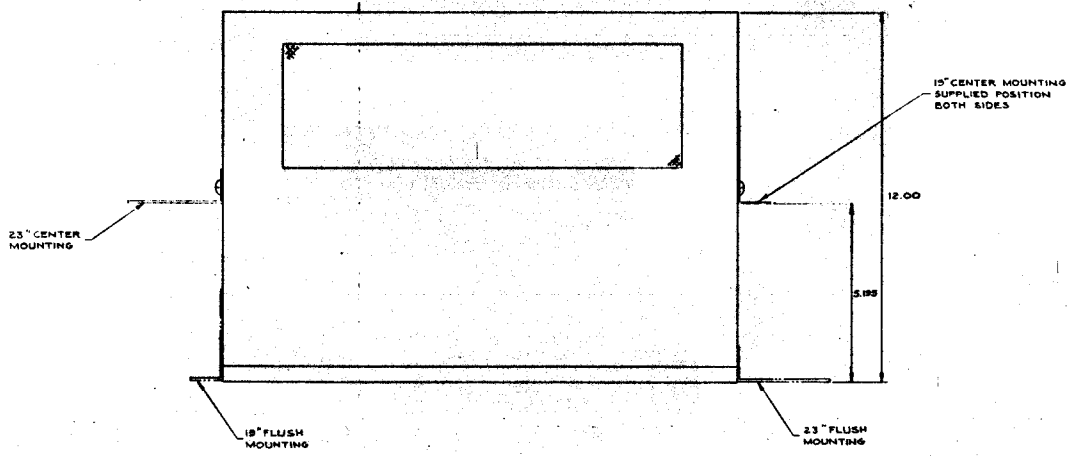
### **6.3.3**

Repeat the process in the two paragraphs above until the last unit's slope is set. Close all input breakers. Fine tune the slope control alternately between units until the converters source current equally. If possible increase the load to check load sharing. All units should track evenly.

12 11 10 9 8 7 6 5 4 3 2 1

REVISIONS			
LTN	DESCRIPTION	DATE	APPR

H  
G  
F  
E  
D  
C  
B  
A



LTN	SIZE AND DESCRIPTION	DATE	BY

DRAWN BY	13 / PB
CHECKED BY	40 / 01/27
MATERIAL	50 / 97.00
WEIGHT	
REDUCTION AVAILABLE	
013 - 011 - 20	
USED BY	
APPLICATION	

<b>TITLE</b> OUTLINE DRAWING CS-11, 13 & 14	
ISSUED DATE	SIZE DRAWING NO.
	D 012 011-06
TOLERANCES	SCALE 1:2 SHEET 1 OF 1

# 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 +1-604-436-5547 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 [www.argusdcpower.com](http://www.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.  
ATTN: RMA Returns  
7033 Antrim Avenue  
Burnaby, BC, V5J 4M5 Canada  
Tel: +1 604 436 5900  
Fax: +1 604 436 1233  
Email: [returns@argusdcpower.com](mailto:returns@argusdcpower.com)

#### USA

Argus Technologies Inc.  
ATTN: RMA Returns  
3116 Mercer Avenue  
Bellingham, WA, 98225 USA  
Tel: +1-360 756 4904  
Fax: +1-360 647 0498  
Email: [returns-usa@argusdcpower.com](mailto:returns-usa@argusdcpower.com)

#### Asia-Pacific

PCM Electronics (Dong Guan) Co., Ltd.  
Hongli Industrial Area, Miaobian, Liaobu Town,  
Dongguan City, Guangdong Province,  
523400 China  
Tel: +86 755 8895 3310  
Fax: +86 755 8895 3307

#### Authorized Service Center

##### Argentina

Argus Technologies de Argentina  
Belen 315, Capital Federal, Buenos Aires,  
14071 Argentina  
Tel: +54 (11) 4672 4821  
Fax: +54 (11) 4504 4698  
Cell: +54 9 (11) 4993 9996  
Email: [ikleiman@argus.ca](mailto:ikleiman@argus.ca)

##### Asia

Argus Technologies Asia Pte Ltd  
Blk 6 Tagore Lane #160  
Singapore 787570  
Tel: +65 6458 8900  
Fax: +65 6458 2122

##### Australia

CPS National  
8/376 Newbridge Rd  
Moorebank, NSW, 2170 Australia  
Tel: +61 02 9822 8977  
Fax: +61 02 9822 8077

##### Australia/New Zealand

Alpha Power Systems Pty Ltd  
Unit 3, 30 Heathcote Road  
Moorebank, NSW, 2170 Australia  
Tel: +61 02 9602 8331  
Fax: +61 02 9602 9180

##### Century Yuasa

37 - 65 Colbalt Street  
Carole Park QLD 4300  
Australian Sales & Service  
Tel: +61 07 3361 6587  
Fax: +61 07 3361 6705  
New Zealand Sales & Service  
Tel: +64 9 978 6689  
Fax: +64 9 978 6677

##### Canada

Compower Systems Inc.  
118 Tiffield Road  
Toronto, ON, M1V 5N2 Canada  
Tel: +1 416 293 3088  
Fax: +1 416 293 0671

##### Europe

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

##### Mexico & Central America

Technologies Argus First De Mexico SA de CV  
Anatole France No. 17  
Col. Polanco  
Mexico City, 11560 Mexico  
Tel: +52 55 5280 6990  
Fax: +52 55 5280 6585

##### 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](mailto:541149939996@nextel.net.ar)

##### Turkey

IPC Enerji Elk San ve TIC AS  
Inonu cad. Kanarya sok. No:20  
Yenisahra - Kadikoy  
Istanbul, Turkey  
Tel: +90 216 317 41 42  
Fax: +90 216 472 90 66