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IRT Eurocard Frame and Power Supply

Types FRU-3001 & PSU-3006

Designed and manufactured in Australia

IRT can be found on the Internet at:
http://www.irtelectronics.com

IRT Eurocard Frame
and
Power Supply

Types FRU-3001
&
PSU-3006

Instruction Book

Table of Contents

Operational Safety:

WARNING

Operation of electronic equipment involves the use of voltages and currents that may be dangerous to human life. Note that under certain conditions dangerous potentials may exist in some circuits when power controls are in the **OFF** position.
Maintenance personnel should observe all safety regulations.

Do not make any adjustments inside equipment with power **ON** unless proper precautions are observed. All internal adjustments should only be made by suitably qualified personnel. All operational adjustments are available externally without the need for removing covers or use of extender cards.

WARNING

AC POWER SUPPLIES

Whilst every effort has been made to prevent exposure of service personnel to dangerous voltages, AC mains input power supplies are by their nature dangerous when connected to the AC mains supply.

Wherever possible maintenance work on power supplies should be carried out with the mains input disconnected - NOT just switched off.

When testing units with the mains supply ON, the supply should be connected through an earth leakage circuit breaker and should not be done without another person in attendance.

Introduction

The grouping of products with a common frame and mains power supply benefits the user by providing economy and efficiency in manufacture and minimum utilisation of valuable space.

Different modules may be mixed in the one frame to provide a compact solution to system design and ease of later expansion.

In addition, the FRU-3001 frame provides for two completely isolated supplies providing essential services with full redundancy.

The FRU-3001, formerly called the FR-748A, provides accommodation for 10 modules. Two PSU's may be fitted for redundancy.

For servicing purposes the TME-6 Eurocard extender board is available for use with cards fitted to the FRU-3001 frame.

IRT Eurocard Frame

Type FRU-3001

General Description

The purpose of the FRU-3001 is to provide an economical and compact mechanical framing system for IRT Eurocards. The FRU-3001 supersedes the FR-748A and is totally reverse compatible.

In addition, the frame provides a power supply bus to reticulate power from one or two common low voltage power supply units to all cards in the frame.

A total of 10 standard IRT Eurocards and two power supply units can be accommodated in one IRT FRU-3001 3 Rack Unit Frame.

A choice of power supply units is available to provide power from either AC or DC supplies. Each supply is capable of supplying 50 VA of power continuously or 80 VA of power for a short period with reduced mains voltage variations. Most IRT modules require less than 5 VA each. AC and DC fed supplies may be mixed in the same frame.

IRT Eurocard products are supplied in two parts; an *electronics module* complete with front fascia panel and *a rear assembly*, which provides the necessary connections to other equipment.

The *electronics module* and *rear assembly* are fitted with multipin mating connectors allowing them to be connected directly together. When assembled in the FRU-3001 frame, a connector on the frame's motherboard makes electrical contact between the two parts.

The *rear assembly* is screwed to the rear of the frame mating with pins extending from the motherboard connector.

The *electronics module* can be inserted or removed from the frame from the front. When inserted it mates with the motherboard connector and thence the *rear assembly*.

This method generally allows the *electronics module* to be inserted or removed without disturbing any wiring connected to the *rear assembly*. (In the case of particular modules special connections may either prevent this or require special care. Please consult installation instructions for particular modules for details.)

An extender card may be used to allow servicing of the module whilst it remains connected to the frame.

Technical Specifications
IRT Eurocard frame
Type FRU-3001

Power:

Input power:	AC	AC mains input (110 Vac, 130 Vac, 220 Vac or 240 Vac ±10%)
		and / or
	DC	-48 Vdc ± 25%
Input power fuses	AC	SLO-BLO 500 mA for 240 Vac
		SLO-BLO 1000mA for 110 Vac
	DC	Fused in PT-748A PSU module.
Output power to module bus:	AC	28 Vac CT (14-0-14) from PSU/3001/PT-701
		and / or
	DC	± 16 Vdc from PT-748A

Connectors:

Electronics modules		B64FWWAB DIN female 64 pin
Power module to frame		H15FP4 H15 female 4 mm PCB mounting.
Power input to frame	AC	IEC 320 with integral fuse holder.
	DC	Klippon MK 1/3 3 pin termination block 2616
Alarm outputs		

Other:

Temperature range	0 - 50° C ambient.
Mechanical	3 RU (482 mm x 132 mm) standard 19" rack frame. Suitable for mounting in standard 19" racks.
Finish:	Natural anodised aluminium frame with passivated steel rear power connection box with black silk-screened lettering.
Dimensions	482 x 132 x 253 mm (Frame empty.) Clearance width 445 mm
Optional accessories	TME-6 module extender card for Eurocard modules. PSU-3006 voltage selectable power supply module. PT-748A single power supply module -48 Vdc input.

Circuit Description

The FRU-3001 provides a circuit path to the modules for two complementary supplies with a common reference making a total of five power busses. One complementary supply bus is obtained from each of the two PSU module locations. Each complementary supply bus may be either AC or DC according to the type of power supply module selected.

The power supply modules connect to the motherboard via special H15FP4 connectors. This allows the modules to be inserted or removed safely whilst power is applied to the frame inputs.

An alarm circuit is provided which connects to the two PSU's. When operating normally, the alarm is open circuit. When supply is lost the alarm line is grounded.

When both PSU's are installed, a failure of either PSU will activate the alarm.

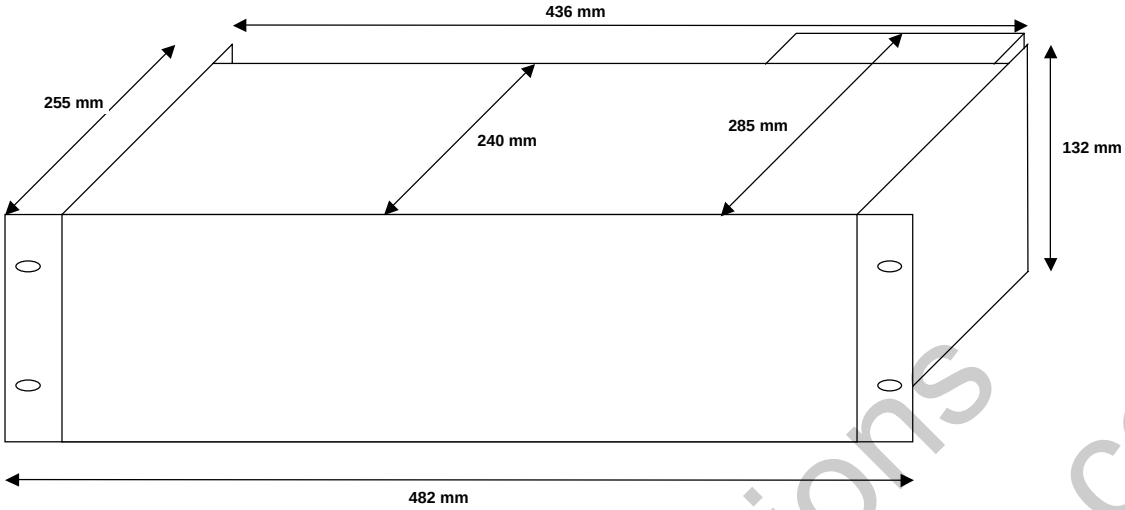
Connection to modules is made via 64 pin DIN connectors as described in the general description above.

Connector pin designations are as follows:

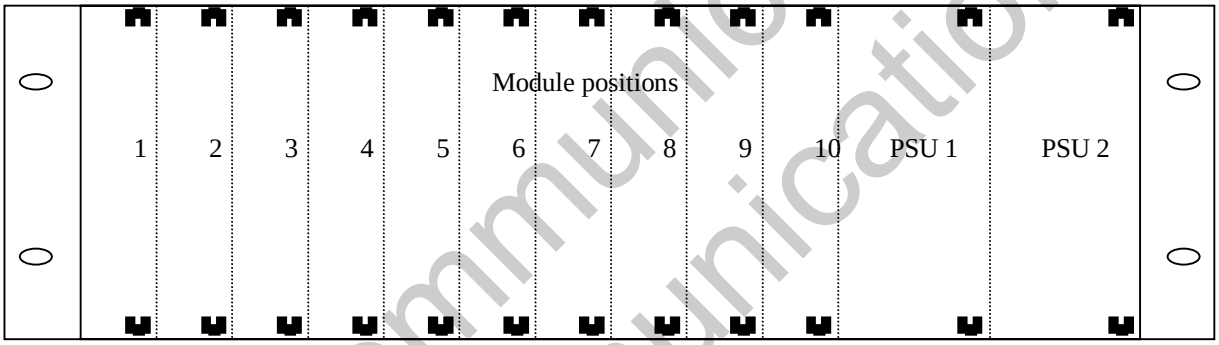
64 pin DIN Eurocard module connector:

Pins	Designation		
21a & 21b	AC/1 +	or	+16 Vdc/1.
22a & 22b	AC/1 -	or	-16 Vdc/1
23a & 23b	AC CT/1 & AC CT/2 & DC Ref./1 & DC Ref/2		
24a & 24b	AC CT/1 & AC CT/2 & DC Ref./1 & DC Ref/2		
25a & 25b	AC/2 +	or	+16 Vdc/2.
26a & 26b	AC/2 -	or	-16 Vdc/2

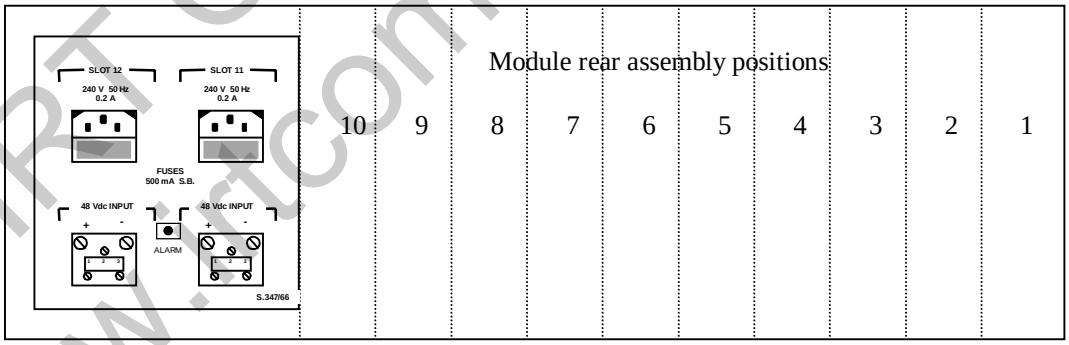
The following diagrams are not to scale and are intended only to show relative locations.



FRU-3001 Front View



FRU-3001 Rear View



Installation

FRU-3001 FRAME:

Eurocard Module
Slide the module into its appropriate position and tighten the two retaining screws.

Rear Assembly
Ensure that the rear assembly has the correct orientation and carefully place the back 64 pin connector over the pins extending from the rear of the appropriate module motherboard connector on the FRU-3001/FR-748A. Slightly move rear assembly to ensure that all 64 pins are aligned to the holes in the rear assembly back connector. Press the rear assembly in the centre, then at the top and bottom until the rear assembly PCB touches the mounting rails at the top and bottom. Install the two retaining screws (Metric M2.5 x 4 mm).

Rear assemblies may be removed for maintenance. Make sure that extraction force is applied equally and steadily at the top and bottom of the rear assembly simultaneously.

If extraction force is not equally applied, there is a good chance that the module connector pins will be bent, making it very difficult to re-install the rear assembly.

Special Note – Fibre optic modules:

Some versions of the FRU-3001 3 RU frame are shipped with shrouds fitted to the motherboard rear assembly connectors as required by contract specifications. These SHROUDS MUST BE REMOVED before optical modules can be fitted in that position. There is no need to remove shrouds from positions that will not be occupied by optical modules, although this will do no harm or effect performance in any way.

The shroud may be easily removed by undoing the attaching screws at the top and bottom of the shroud/connector. These may be replaced after the shroud is removed.

Warning

Optical Connections

The optical connectors on modules may be attached to the main module PCB, NOT the rear connector assembly.

When installing the optical fibre sufficient slack should be allowed for the module to be withdrawn with the optical fibre attached until the connector is clear of the frame and can be disconnected.

If this is not done, the module will not be able to be removed without first disconnecting the optical fibre at the rear. Attempting to remove the module without first disconnecting the fibre may result in damage to the fibre and / or the module.

Power Supply

The frame will operate with either one or two power supply modules installed.
The power supply module should be slid into either slot 11 or 12 at the right hand end of the frame. The four retaining screws on the front should be tightened.

Connect power input to rear of frame. For DC input, observe the polarity markings next to each connector.

Due to its weight if the frame is to be freighted for any purpose the power supply should be removed and packed separately before shipment.

EMC

Due to EMC (electromagnetic compliance) standards, IRT recommends that all unused card positions be closed off using IRT front blanking panels, on the front, and rear blanking panels, on the rear, of the frame.

IRT Power Supply for Eurocard

Type PSU-3006

General Description

The PSU-3006 is designed to provide the low voltage AC power required for operation of up to 10 standard IRT Eurocard modules. The PSU-3006 supersedes the PT-701 and PSU-3001 and is fully reverse compatible with these power supplies. The PSU-3006 adds the facility of providing for selection of the AC mains input voltage by way of a selector switch on the side of the PSU.

Two PSU-3006's can be operated redundantly when using an FRU-3001 Frame. The redundant power supply facility of the PSU-3006 is enabled in each IRT Eurocard module by having the power supply circuit of each module made up of two bridge rectifier circuits with the outputs connected in parallel. This allows the 28 Vac CT voltages to be sourced from either PSU-3006.

A front panel LED indicator provides visual confirmation of the presence of the low voltage output.

An alarm relay is also included which will activate the alarm if either side of the AC output fails.

A voltage selector switch allows the PSU-3006 to be configured for 240V, 220V, 130V or 110V operation.

Technical Specifications
IRT Eurocard Dual Power Supply Module
Type PSU-3006

Power Requirements:

Voltage	240 Vac ± 10% 220 Vac ± 10% 130 Vac ± 10% 110 Vac ± 10%
Frequency	50 - 60 Hz ±10%
Fusing	500 mA anti-surge for 240V and 220V operation, 1000 mA anti-surge for 130V and 110V operation. Fuses are installed in the associated FRU-3001 frame.

Standards Approval: AS3260 approval no.: CS6346N

Output: 28 Vac centre tapped (14 - 0 - 14) fully loaded.
50 VA maximum.

Connectors: AC power input / AC output H15MFAV32 male, Faston

Other:

Temperature range		0 - 50° C ambient
Mechanical		Suitable for mounting in FRU-3001 rack frame
Finish:	Front panel	Grey enamel, silk-screened black lettering & red IRT logo
	Body	Passivated steel with silk-screened black lettering.
Dimensions		6 HP x 3 U x 230 mm

Circuit Description

The PSU-3006 consists of a power transformer, which provides a 28 Vac centre tapped output.

All connections to the module are made via a single multipin connector. Extreme care should be taken when working in the vicinity of this connector as it carries the live mains input voltage.

The front panel LED power indicator is supplied from the output with the full 28 Vac via a rectifier diode and series resistor.

The alarm relay is powered from the output rails, in parallel with the LED indicator, by way of a series 20 Volt zener diode. Thus if either rail fails there is insufficient voltage to operate the relay and the alarm will indicate the fault condition. A capacitor is provided across the DC relay supply to prevent relay chatter.

The alarm is shown in the un-energised position. When operating normally the alarm is open circuit. When supply is lost the alarm line is grounded.

Pre-Installation:

Handling:

This equipment may be connected to static sensitive devices and proper static free handling precautions should be observed when disconnecting or reconnecting either the input or the output of the PSU.

Power:

Set the Voltage selector switch for the correct input Mains voltage. Ensure that the correct fuses are installed in the associated FRU-3001 frame – 1000 mA anti-surge for 130 and 110V and 500 mA anti-surge for 220 and 240V operation.

Earthing:

Supply earth:

For safety reasons a connection is made between the IEC connector earth pin and the FRU-3001 chassis. No attempt should be made to break this earth connection.

When the PSU-3006 is installed in the FRU-3001 frame a connection will be made between the above earth and the PSU-3006 chassis. This earth is also connected to the centretap output connection of the PSU-3006.

Power supply output earth:

No connection is made between the output connections of the PSU-3006 and earth within the PSU-3006 itself.

Signal earth:

FRU-3001 frame:

When the rear assembly of a module is connected to the FRU-3001 frame, the signal earth of that rear assembly may or may not be connected to the chassis depending on the particular rear assembly design.
Power supply connections on the rear assembly are not connected to the signal earth on the rear assembly.

When a module is inserted into the FRU-3001 frame, a connection is made between the PSU-3006 power supply centretap and signal earth. Depending on the particular module design, the signal earth may be connected to the front panel of the module and may therefore make a connection to the PSU-3001 frame via the front securing screws.

This results in a central earth point on <u>each</u> module for power supply and signal.

Installation & Servicing

The PSU-3006 contains no user serviceable parts inside and should not be opened.

In the event of failure of the supply, the input operating voltage and IEC input connector fuse should be checked.

If fault persists the complete unit should be returned to IRT or your local agent for service.

Performance:

One PSU-3006 is designed to provide adequate power for an FRU-3001 frame equipped with its maximum of ten Eurocard modules under normal conditions. During normal operation, this power is shared between the two supplies mounted in the frame.

This performance is contingent on two power supplies being operational and the AC mains supply input being within the specified range.

Where both an AC and DC supply are fitted in the one frame, the degree of load sharing will be dependent on the AC input voltage to the PSU-3006. This will directly effect its output voltage whereas the DC supply will continue to supply a constant voltage output over a wide range of input voltages.

If only one supply is operational or the AC supply voltage to one supply is low, module performance may be effected.

The provision of two power supplies is intended to provide continued operation, during failure of one supply, until the second supply is able to be restored. Continuous single supply operation is not recommended.

If the AC mains supply input is subject to wide fluctuation, a suitable stabilised source should be installed.
If it is continuously at the lower range of that specified, one of IRT's other PSU's with the required input voltage should be substituted for the PSU-3006.

FRU-3001 Frame:

The PSU-3006 should be slid firmly into either of the two double width slots (11 & 12) at the right of the frame. The four retaining screws on the front should then be tightened.

Power to the PSU-3006 is supplied from a connector located on the rear of the FRU-3001, immediately to the rear of the module.

Note that the IEC320 connectors have inbuilt fuses. A spare fuse may also be stored inside the connector. The fuse should 1000 mA anti-surge for 130 and 110V operation and 500 mA anti-surge for 240 and 220V operation.

The alarm output connector is located on the rear of the FRU-3001 frame and is common to both supply units when installed. The alarms for both units are in parallel such that when a fault develops in either PSU the alarm output will be grounded.

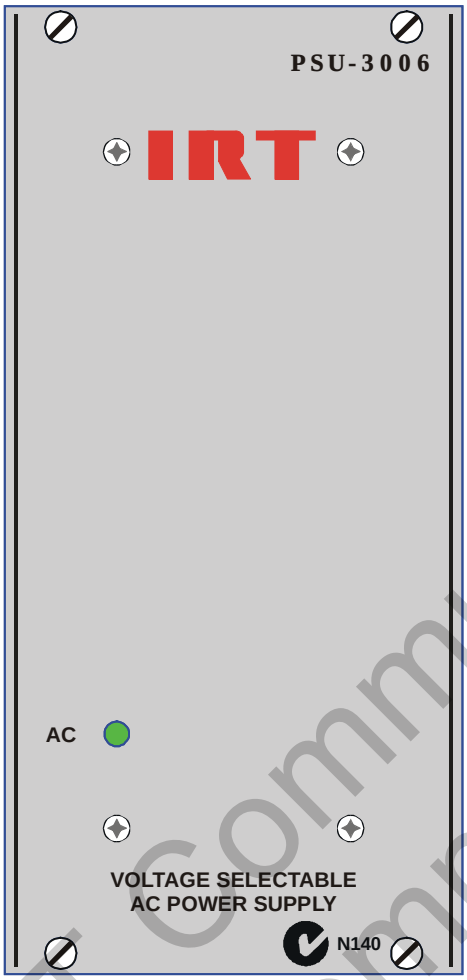
Due to its weight the PSU-3006 can be damaged itself or cause damage to the frame if subjected to a large mechanical shock.

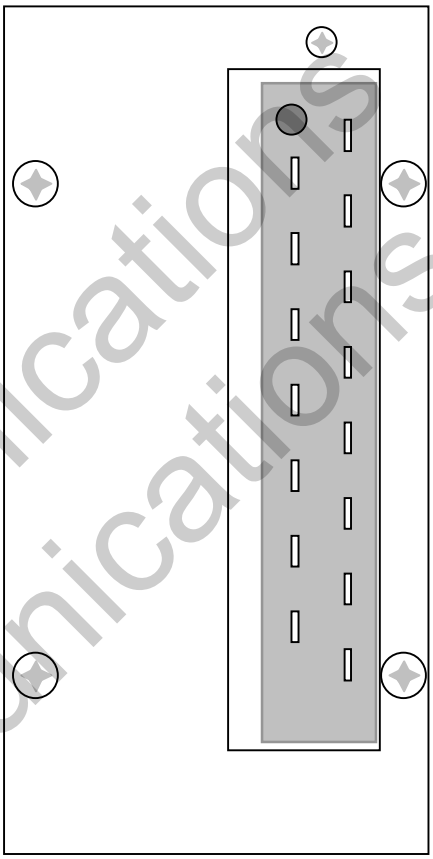
If the frame is to be freighted for any purpose, remove the PSU-3006 and pack separately before shipment taking care to ensure that protruding edges of front fascia panel are well protected.

For this purpose we recommend the use of plastic bubble packaging.

Front & rear panel connector diagrams

The following front panel and rear assembly drawings are not to scale and are intended to show relative positions of connectors, indicators and controls only.





Warranty & service

Equipment is covered by a limited warranty period of three years from date of first delivery unless contrary conditions apply under a particular contract of supply. For situations when "**No Fault Found**" for repairs, a minimum charge of $A100.00 will apply, whether the equipment is within the warranty period or not.

Equipment warranty is limited to faults attributable to defects in original design or manufacture. Warranty on components shall be extended by IRT only to the extent obtainable from the component supplier.

Equipment return:

Before arranging service ensure that the fault is in the unit to be serviced and not in associated equipment. If possible, confirm this by substitution.

Before returning equipment contact should be made with IRT or your local agent to determine whether the equipment can be serviced in the field or should be returned for repair.

The equipment should be properly packed for return observing antistatic procedures.

The following information should accompany the unit to be returned:

1. A fault report should be included indicating the nature of the fault
2. The operating conditions under which the fault initially occurred.
3. Any additional information which may be of assistance in fault location and remedy.
4. A contact name and telephone and fax numbers.
5. Details of payment method for items not covered by warranty.
6. Full return address.
7. For situations when "**No Fault Found**" for repairs, a minimum charge of $A100.00 will apply, whether the equipment is within the warranty period or not.

Please note that all freight charges are the responsibility of the customer.

The equipment should be returned **to the agent who originally supplied the equipment or, where this is not possible**, to IRT direct as follows.

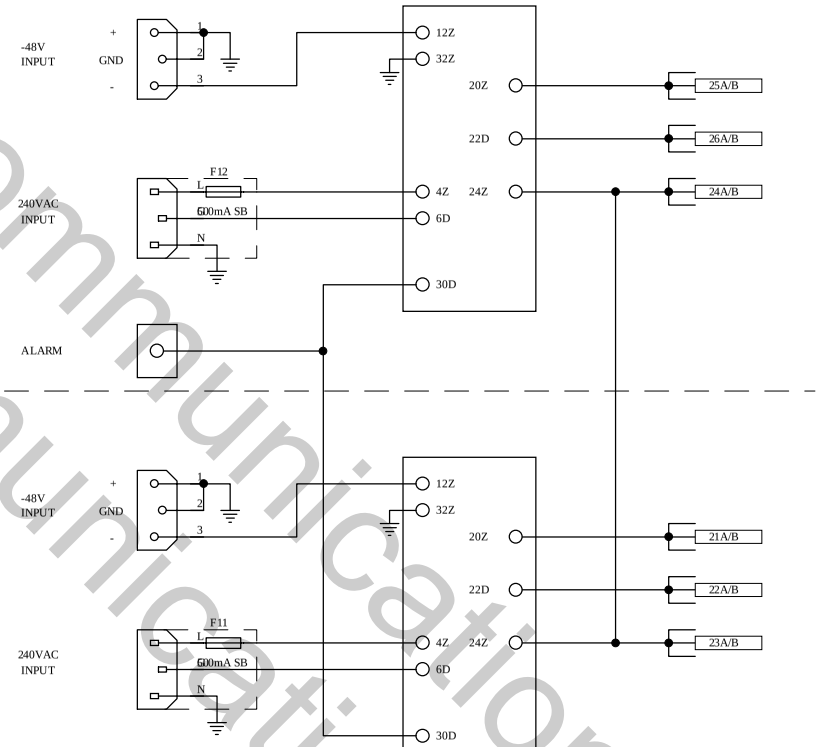
Equipment Service
IRT Electronics Pty Ltd
26 Hotham Parade
ARTARMON
N.S.W. 2064
AUSTRALIA

Phone: 61 2 9439 3744 Fax: 61 2 9439 7439
Email: service@irtelectronics.com

Drawing index

Drawing #	Sheet #	Description
803658	1	FR-3001 Eurocard frame
804531	1	PSU-3006 schematic diagram

SLOT 12



SLOT 11

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CONTRACT No.

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SIZE A3

TITLE FR-748A FRAME

SCALE

DRAWING No. 803658

SHEET 1 OF 1

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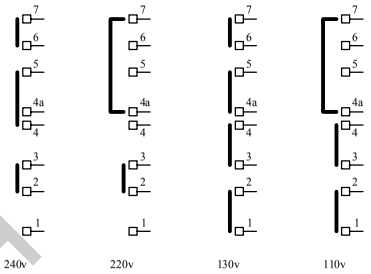


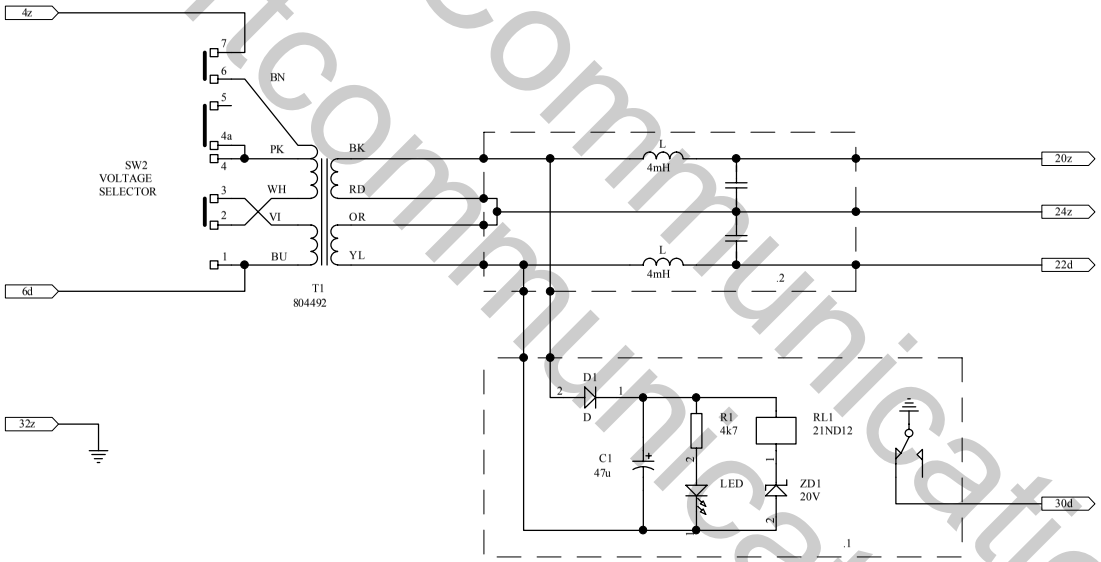
SW2 INTERNAL CONNECTIONS

POSITIONS 150 & 260 ARE INOPERATIVE

FUSE RATING

240 & 220V = 500mA SLO BLO

130 & 110v = 1000mA SLO BLO



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