Data Sheet
April 2002

RM0750-Series Front-End Power Supplies: 85 Vac to 264 Vac Input; 48 Vdc to 56 Vdc Output; 750 W

Applications

- Advanced workstations
- Midrange computers
- Mainframes
- File servers
- LAN/WAN applications
- Mass storage
- Telecommunications equipment

Features

- Universal ac input
- Power-factor correction (meets IEC1000-3-2 requirements)
- Overvoltage and overcurrent protection
- Overtemperature protection
- *UL** 60950 Recognized, *CSA*† C22.2 234/ 60950-00 Certified, and VDE 0805 (EN60950-1)
- CE mark meets 73/23/EEC and 93/68/EEC directives‡
- Redundant parallel operation
- Remote on/off
- Active load sharing
- Remote sense
- Hot insertion/removal (hot plug)
- Power fail warning
- Fault alarm
- Output current monitor
- Overtemperature warning
- External voltage margining
- Additional alarm and control
- Front-panel LED indicators

Description

The RM0750-Series front-end power supplies are specifically designed to operate as an integral part of a complete distributed power system, with or without battery backup. A full complement of alarm and shutdown features have been incorporated into the power supply to protect the system in the event of a fault condition. The flexible feature set makes this front-end power supply an excellent choice for applications requiring modular ac-to-dc bulk intermediate voltages, such as distributed power and dc UPS.

* *UL* is a registered trademark of Underwriters Laboratories, Inc.
† *CSA* is a registered trademark of Canadian Standards Association.
‡ This product is intended for integration into end-use equipment. The required procedures for CE marking of end-use equipment should be followed. (The CE mark is placed on selected products.)

Electrical Specifications

Input Specifications

Table 1. Input Specifications

Parameter	Min	Typ	Max	Unit	Note
Input Voltage	85 170	— —	139 264	Vac Vac	Unit will shut down if line voltage drops below either range.
Input Frequency	47	—	63	Hz	—
Inrush Current (peak)	—	—	50	A	Inrush of FEU at 264 Vac.
Power Factor	0.90	0.99*	—	—	≥50% of full load.
Input Leakage Current	—	—	0.72	mA	255 Vac, 60 Hz.
Lightning Surge and Transients (damage-free operation)	—	—	—	—	1) IEC1000-4-5 Level 4. 2) IEC1000-4-4 Level 3.
Hold Over Time	20	—	—	ms	—
EMC (conducted)	—	—	—	—	CISPR22 Class A, EN55022 Class A, with 6 dB of margin.

* At full load.

Line Harmonics

Active power-factor correction circuitry ensures that this power supply meets the requirements of IEC1000-3-2 with up to four power supplies connected in parallel and operating at full load.

Efficiency and Power Factor vs. Input Voltage at Full Load

Table 2. Efficiency and Power Factor vs. Input Voltage at Full Load

Input Voltage	Efficiency (Typical)	Power Factor (Typical)
90 Vac	82%	0.99
100 Vac	83%	0.99
120 Vac	84%	0.99
190 Vac	86%	0.98
220 Vac	86%	0.98
240 Vac	87%	0.98
264 Vac	87%	0.98

Notes:
When using this table to calculate line cord requirements, allow, at a minimum, an extra 3% for variations between units.
Actual measured results will depend upon the harmonic content of the input voltage waveform.

Electrical Specifications (continued)

Output Specifications

Table 3. Output Specifications

Parameter	Min	Typ	Max	Unit	Note
V_O Set Point:					
RM750A	—	48.0	—	Vdc	Frame GND strappable to either output terminal.
RM750H	—	54.5	—	Vdc	
RM750L	—	56.2	—	Vdc	
Regulation (line, load, temperature, and set point)	–2.0	—	2.0	%	Measured at remote sense.
Remote-sense Drop	—	—	1.0	Vdc	—
Output Voltage Margin Range:					
RM750A	43.5	—	48.0	Vdc	Vmargin 0 to 5 V.
RM750H	43.5	—	54.5	Vdc	Vmargin = 0, V_O = Vsetpoint.
RM750L	43.5	—	56.2	Vdc	Vmargin = 5, V_O = 43.5.
Io (rated):					
RM750A	0	—	15.6	Adc	750 W maximum.
RM750H	0	—	13.7	Adc	750 W maximum.
RM750L	0	—	13.3	Adc	750 W maximum.
Ripple and Noise (50 MHz bandwidth)	—	—	300	mVp-p	Under any load condition.
Transmission Noise	—	—	45	dBrnC	
Output Rise Time	50	—	200	ms	Rise from 10% to 90% of final output level (resistive load).
Overvoltage Protection	58.8	—	59.9	Vdc	Selective latched high-voltage shutdown when ORing diode present. Reset by cycling ac input, pressing RESET, or reinsertion.
Output Current Limit (steady state)	—	—	21	Adc	See Figure 1 for details.
Transient Response	45.0	—	59.9	Vdc	25% step at 25% to 75% static.
Active Current Sharing Differential	—	—	1.5	A	Single-wire current share at full load.
Efficiency:	—	84	—	%	At full load, 120 Vac, with ORing diode.
	—	87	—	%	At full load, 264 Vac, with ORing diode.
Reverse Output Current Protection	—	—	—	—	ORing diode.
Turn-on Delay	—	3	4	s	Measured from application of valid ac voltage.
Current Monitor	—	1 mA/A	—	—	(1 ± 0.02) mA/A ± 1.25 mA.

Electrical Specifications (continued)

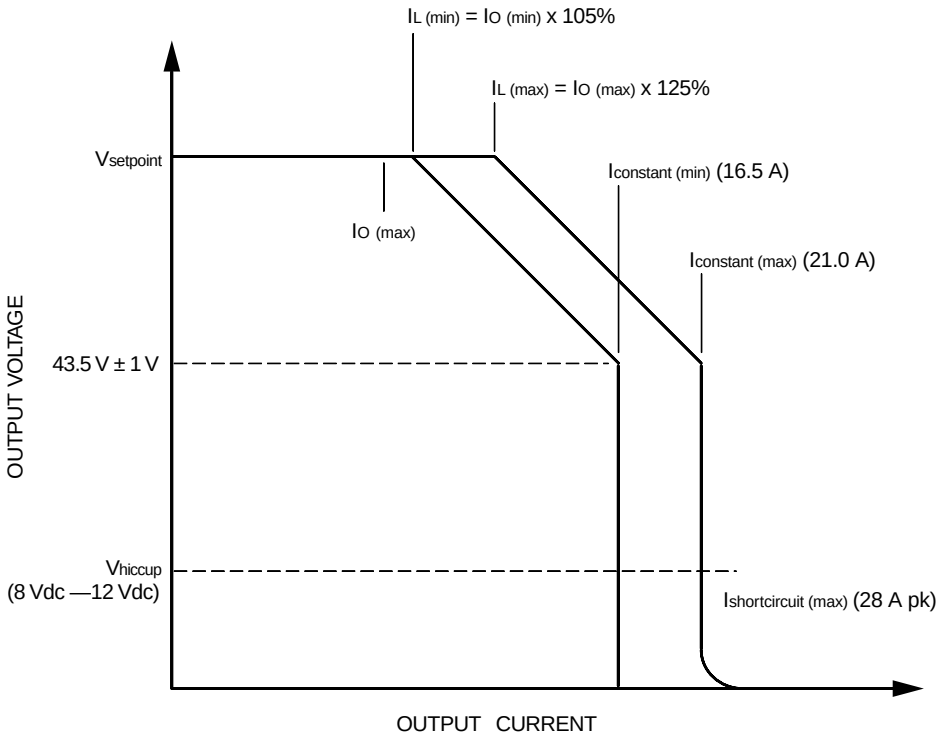


Figure 1. RM0750-Series Output Voltage and Current (Steady State)

The power unit will operate in the constant voltage mode until the load current exceeds $I_{L\ (min)}$, which is 105% of $I_{O\ (max)}$. As the load current exceeds $I_{L\ (min)}$, the power supply begins to operate in the constant power mode. The output voltage will decrease as the output current increases. This mode will continue until the output voltage drops below 43.5 Vdc, when the power supply enters the constant current mode. The output voltage will continue to decrease, but the current will be limited to $I_{constant}$ until the output voltage reaches approximately 12 Vdc. At this level, the power supply operates in the hiccup mode. The maximum short-circuit current that can be drawn from the power supply is $I_{shortcircuit}$.

Environmental Characteristics

Table 4. Environmental Characteristics

Parameter	Min	Typ	Max	Unit	Note
Storage Temperature	–40	—	85	°C	—
Operating Temperature (air inlet to power unit)	0	—	50	°C	Airflow front to back with 3” clearance for exhaust air in unpressurized enclosure.
Acoustics	—	60	—	dBA	Sound pressure level at 1 m.
Humidity (noncondensing)	5	—	95	%	—
Altitude	–200	—	13,000	ft.	Derate at 2°C/1000 ft. above 8000 ft.
Shock and Vibration	—	—	—	—	Tyco L-533809.
ESD	—	—	—	—	IEC1000-4-2 Level 3 stand-alone.
Electromagnetic Immunity (error-free)	—	—	—	—	IEC1000-4-3 Level 2 stand-alone.
Reliability	— 1.5×10^5	— —	7500 —	FITs hours	At 40 °C, 200 Vac, 600 W. Per TR-EOP-000332. MTBF per RIN.

Physical Specifications

Weight is typically 8 lbs. See the Outline Diagram for dimensions.

Warranty Information

When used within specified operating conditions, Tyco Electronics will warrant that this product will conform to published specifications and is free of material and workmanship defects for the period of two (2) years from date of manufacture. This warranty applies only to units having the date code of warranty period or less when returned to Tyco Electronics for repair. Tyco’s liability will be limited to the repair or replacement, at our option, of the returned unit. Our warranty does not extend to any unit which has been subjected to abuse, misuse, or neglect or to units that have been repaired or altered by anyone other than Tyco Electronics or authorized agent.

Physical Descriptions

Definition of Terms

Power-Factor Correction

All RT-Series power supplies comply with the specifications set forth in IEC1000-3-2.

Input Overcurrent Protection

An internal fuse is provided for input protection in compliance with safety agency requirements.

Overcurrent Protection

In the event of an overload condition, the power supply limits the output current. See Figure 1 for details.

Overvoltage Protection

The power unit turns itself off before the output voltage reaches a specified threshold.

Overtemperature Protection

In the event of an overtemperature condition, the power unit protects itself by shutting off. Restarts automatically after cooling down.

ORing Diode

A diode at the output of the power unit protects the dc bus during a power supply failure or hot plugging of the power unit.

Remote On/Off

This is an input signal referenced to the negative output. Shorting this signal to the negative output causes the output of the power unit to turn off.

Current Monitor

This is an analog output current signal proportional to the output current of the unit with a gain of 1.0 mA/A.

Voltage Margining

This is an analog input signal. Adjust the voltage level of this signal to vary the output voltage of the power unit.

Load Share

A single-wire interface between each of the power units forces them to share the load current equally.

Remote Sense

These signals permit the power units to compensate for a voltage drop across the output distribution.

Reset

Toggle this input signal to allow the power unit to recover from a latched shutdown condition.

Redundant Bias Supply

This protected feed from the internal bias supply may be used to source a small amount of 12 V power or externally power the alarm and control logic.

ac Line Discrimination

The unit senses the input line range at powerup and shuts the unit down if the input drops below that line range for a specified period of time.

Front-Panel LEDs

Power OK (green): The unit is powered up and operating normally.
Fault (yellow): The unit has detected an internal fault.
Overtemp. (yellow): The unit has shut down due to overtemperature conditions.
Current Limit (yellow): The unit is overloaded and operating in current limit.

Status Signals

The following are the optically isolated open-collector signals. All are active-low signals.

Fault: The unit has detected an internal fault. Fault signal is asserted, only if ac input is within the normal range, and output voltage falls 5.5 V below the $V_{setpoint}$.
Overtemp. Warning: The unit is overheating; shutdown is imminent.
Power Fail Warning: The output of the power unit will fail in 5 ms.

Front-End Power Supply Interfaces

Input Voltages

The product can be used with any standard global line voltages; consult the factory for any particular regional application concerns.

Input Connector

The ac input connection is through an IEC320 type connector system rated 10 A/250 Vac in Europe/Asia and 20 A/120 Vac in North America.

Grounding

Frame ground can be connected so that the output may be floating, have a positive ground, or have a negative ground.

Output Connector

The output connector is a DIN M style, with two power pins and 42 signal pins, DIN 41 612 Type M definition.

Connector Pin Assignment

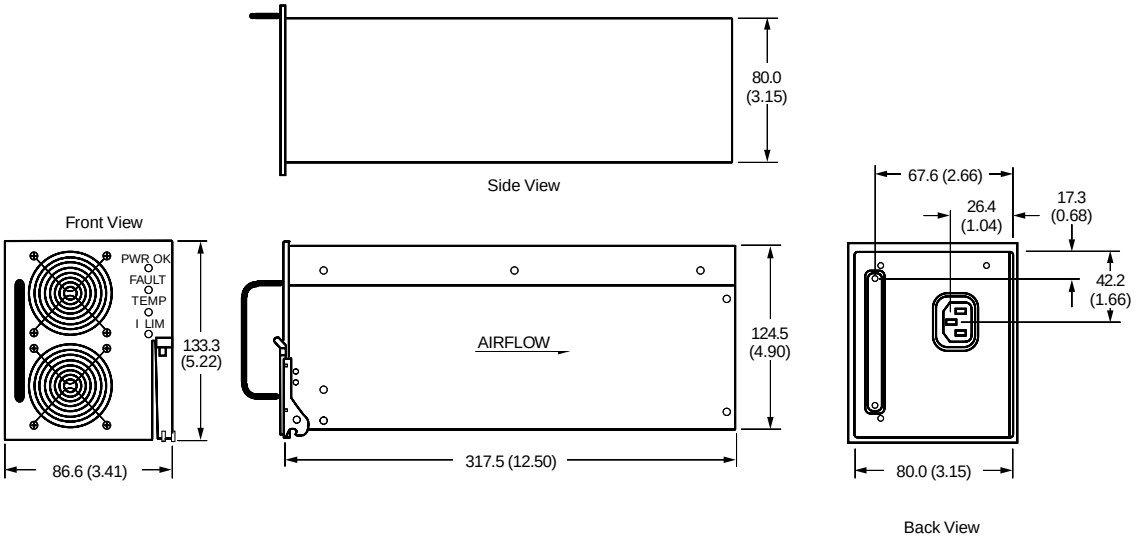
Table 5. Connector Pin Assignment—View into Rear of Power Unit

	A	B	C
31		V +	
28		Frame Ground	
25		V –	
23	Reserved*	Reserved	Reserved
22	No Connection	Reserved	Reserved
21	No Connection	Reserved	Reserved
20	No Connection	Reserved	Reserved
19	No Connection	Bias	No Connection
18	No Connection	Sense +	Sense –
17	No Connection	Current Monitor	No Connection
16	No Connection	Load Share	Voltage Margin +
15	No Connection	Reset	Voltage Margin –
14	No Connection	Remote On/Off	Reserved
13	No Connection	Missing Module +	Missing Module –
12	No Connection	Power Fail Warning +	Power Fail Warning –
11	No Connection	Overtemp. Warning +	Overtemp Warning –
10	No Connection	Fault +	Fault –
8		No Connection	
5		No Connection	
2		No Connection	

* Factory test pin; no connection allowed.

Outline Diagram

Dimensions are in millimeters and (inches).



8-1421

Ordering Information

	Comcode	Description
RM750AA001	108687591	750 W. 52V
RM750AA200	108882549	750 W. 52 V, custom color

World Wide Headquarters
Tyco Electronics Power Systems, Inc.
3000 Skyline Drive, Mesquite, TX 75149, USA
+1-800-843-1797
www.power.tycoelectronics.com

Europe, Middle-East and Africa Headquarters
Tyco Electronics (UK) Ltd
Tel: +44 (0) 1344 469 300, Fax: +44 (0) 1344 469 301

Central America-Latin America Headquarters
Tyco Electronics Power Systems
Tel: +54 11 4316 2866, Fax: +54 11 4312 9508

Asia-Pacific Headquarters
Tyco Electronics Singapore Pte Ltd
Tel: +65 482 0311, Fax: 65 480 9299

April 2002
FDS02-022LIN (Replaces FDS01-062DPA)

Printed on
Recycled Paper