Electrical Specification for:	**48V 2KW 1U AC-DC Power Supply**
Telkoor Model:	**PS-2048**

CUSTOMER: GENERAL	SIZE		CAGE CODE	S5417	DWG. NO.	2048-DOC1-10		REV	A
	SCALE			RELEASE DATE	26/06/11	SHEET	1	OF	11

REVISION HISTORY					
Rev Level	Rev Date	Change Made	Reason for Change	Effective	Approved By
A	22/06/11	Release for production	Release for production	22/06/11	S.Sadot

Approvals		
	Name	Date
Written by:	S. Sadot	22/06/11
Engineering:	S. Sadot	22/06/11

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Input:

Input Voltage:	90 – 254Vac continuous, 47-63Hz , single phase
Inrush Current:	Less than 40A
Power Factor:	0.98 typical at 230Vac, full load 0.99 typical at 115Vac, full load
Efficiency	90% typical at 230Vac, full load rated power 86% typical at 115Vac, full load rated power
Input Protection:	Internal Line Fuse: IEC type 3AG 20A 250Vac NORMAL ACTION
Brown– Out:	75 to 300Vac for 50Msec

Output Voltages & Currents:

Input Range	*Output Voltage*	*I Min. Load*	*I Max. Load*	*Max. Power*
100Vac – 140Vac	48V	0	32A	1500W
180Vc – 254Vac	48V	0	40A	2000W
90Vac – 254Vac	11.2 – 12.5 V (Auxiliary) (1)	0	0.1A	1.2W

Output:

Line Regulation:	± 0.4% for Vin (Min) to Vin (Max).
Load Regulation:	± 0.5% for load changes from zero to full load.
48V/24V Ripple & Noise	300mV/200mV pk-pk Max @ 20 MHz bandwidth with 1u ceramic and 10 electrolytic on measure point.
Output Voltage Adjustment Range	± 5%
Initial Set Point Tolerance:	± 150mV
Overshoot & Undershoot:	Less than 1% at turn ON-OFF
Transient Load Response:	± 3% Max. (2% typical) deviation for load change of 50% to 100%, at slew rate of 1A/usec, recovery time less then 1mSec
Hold-up Time:	10mSec minimum.
Turn-On Rise Time:	50mSec Max.
Over-current Protection:	105 to 125% of IMax, constant current limit, automatic recovery, when cause of overload or short is removed
Over-voltage Protection:	Shut down at 110 ÷ 130% of nominal output, AC input must recycled to restart.
Temperature Protection:	Shutdown due to excessive ambient temperature at over heating or malfunction of cooling fans, unit recovers automatically typical hysterisis 30°C.
Remote Sense on V1	800mV Max. voltage compensation for cable losses with respect to the main output
Current Share	N+1 Redundancy.
Hot Swap	Internal O-Ring diode (FET)

1 - Need minimum load of 48V/1A

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Signals & Commands

Important note: All signals and commands refer to +12V RTN.

(See attached pin assignment table)

Remote ON/OFF control	By electrical signal or dry contact ,ON 0-0.6V or short OFF 2-15V or open.
PS_ Alarm:	Open collector active high when the output drops 10% below nominal.
AC_OK:	Open Collector Active high when AC out of range.
I²C (IPMI interface) - *OPTION*	Internal I²C/IPMI interface Card

Front Panel Indicators

AC OK	Green LED illuminates for AC O.K
DC OK	Green LED illuminates for DC OK.
DC FAIL	Red LED illuminates for DC FAIL

Environmental Specifications:

Temperature:	Operating: -5°C to +50°C (de-rating linearly to 70 °C with 50% de-rating). Storage: -40°C to +85°C.
Temperature Coefficient:	0 to 70°C ± 0.02%/°C
Cooling:	By internal fans , Variable speed control.
Humidity:	10 to 90% RH non-condensation.
Altitude:	Operating 10,000 ft. Non- operating 40,000 ft.
Vibration:	Meet ETS 300 019
Shock	Meet ETS 300 019

Safety Regulatory & EMC Specifications (Designed to meet):

MEETS FCC CLASS B, CISPR 22 CLASS B,EN55022 CLASS B with an external TBD line filter

EN61000-3-2	HARMONICS
EN61000-3-3	VOLTAGE FLUCTUATION
EN6000-4-2	ESD +8KV AIR +4KV CONTACT DISCHARGE, performance criteria B
EN61000-4-3	RADIATED IMMUNITY: 80-1000Mhz 3V/m, AM 80% (1KHz), criteria A
EN61000-4-4	FAST TRANSIENT: 1KV for AC power port, 0.5KV for DC power I/O and signals Port, performance criteria B
EN61000-4-5	SURGE: 2KV common mode and 1KV differential mode
EN61000-4-6	3VRMS, 80% A.M. BY 1kHz
EN61000-4-8	3A /m at 50Hz, performance criteria A.
EN61000-11	VOLTAGE Dips and interruption: 30% reduction for 10mSec –Criteria B, 60% For 100mSec. Criteria C, 95% reduction for 5000mSec Criteria C.

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Dielectric Withstand:

Input to Case	1500VAC
Input to Output	3000VAC
Output to Case	500VDC

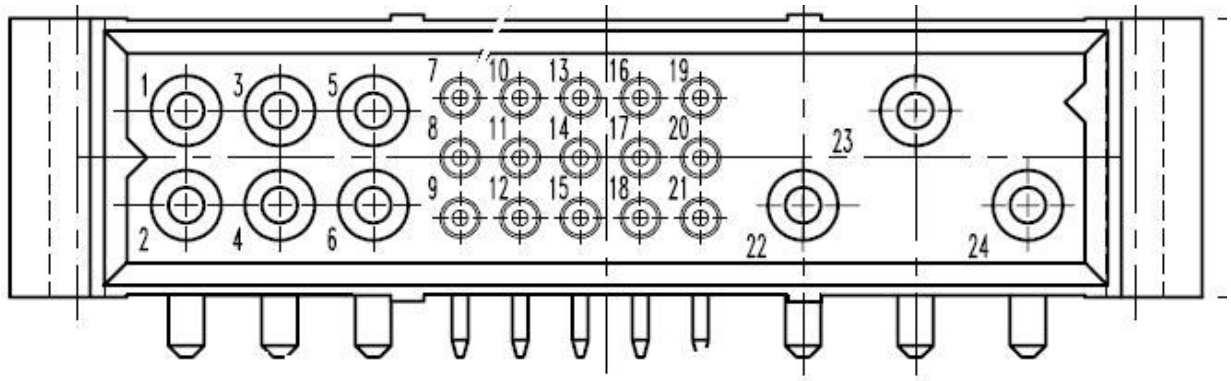
Safety Agency Compliances:

Safety	UL60950, EN60950 , CB REPORT
leakage current:	Less than 1.1mA at 230Vac
MTBF:	300,000 hours minimum per BELCOR 332,issue 6 specification @ 30°C

Mechanical Dimensions

Size (W,H,D)	127X41X290 mm see Outline Drawing
Weight	1.6Kg
I/O Connector	Positronic Right Angle PCB mount PCIB24W9M400A1
Mating Connector	Positronic type PCIB24W9F400A1-S1031

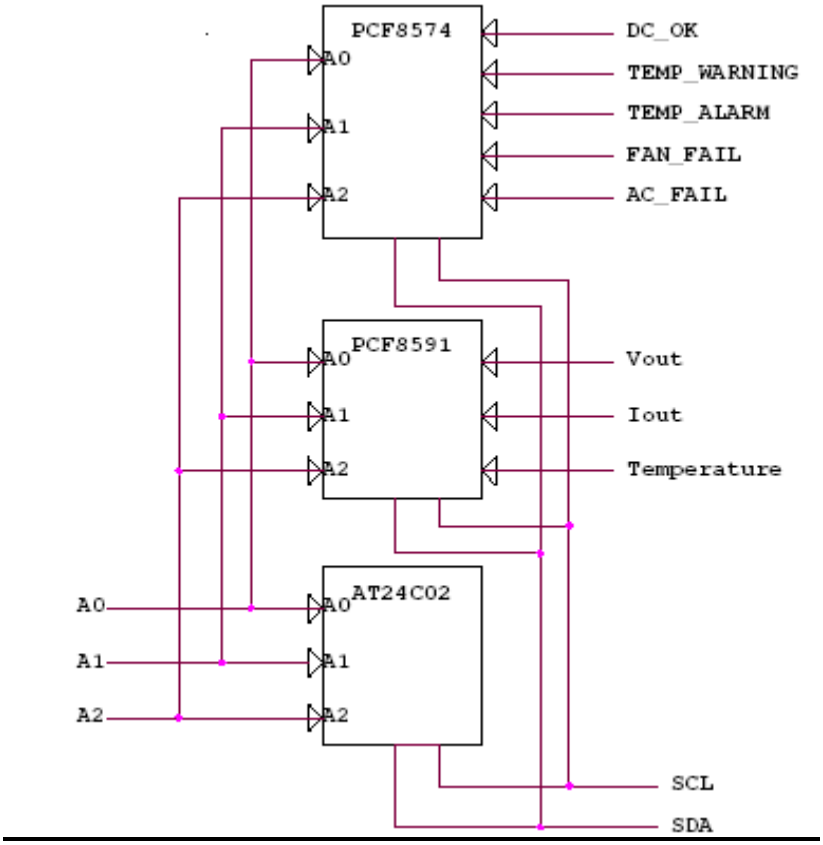
Right angle (90°) PCB mount male connector POSITRONIC# **PCIB24W9M400A1**



Internal I²C Interface

The PS-1648 provide power good ,output current ,output voltage, internal temperature and fault reporting through I2C.
The block diagram below shown the I2C interface typical connection.

Internal I²C Basic Functionality



Status Signals Report

The power supply provides by a PCF8547 (8 bit register) through I2C protocol
the signals status while “0” indicates OK and “1” indicates fault.

PCF8547 Function

BIT	FUNCTION	DESCRIPTION
0	DC_OK	Output voltage is less than 80% of nominal output
1	TEMP_ALARM	Supply shut down by over temperature protection circuit
2	TEMP_WARNING	Internal temperature is 10% below shut down point
3	FAN_FAIL	Failure of one or two of internal fans
4	AC_FAIL	Input voltage lower than 82Vac
5	N.C	Remain “0”
6	N.C	Remain “0”
7	N.C	Remain”0”

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PCF8547 Slave Address

BYTE	BIT							
	7(MSB)	6	5	4	3	2	1	0(LSB)
address	L	H	L	L	A2	A1	A0	R/W

EEPROM Circuit AT24C02

The EEPROM data is arranged by "fields", each containing specific information.
The overall size of data inside the chip is 256 bytes from address 0 to address 255.

Field Address	Field size	Stored data type	Stored data example
0	1	Telkoor internal usage	Do NOT change this field
1÷29	29	Manufacturer	TELKOOR LTD.
30÷37	8	Date Code	JAN/2005
38÷42	5	Serial Number	02008
43÷44	2	Revision	01
45÷55	11	Part Number	900-1648-000
56÷85	30	Customer	MelLanox
86÷99	14	Model Number	PS-1648
100÷124	25	STANDARDS	UL/TUV/CSA/CE
125÷255	131	Telkoor internal usage	Do NOT change this field

Slave AT24C02 Address

Bit	7	6	5	4	3	2	1	0
Rate	L	H	L	L	A2	A1	A0	R/W

PCF8591 8-bit A/D

The PCF8591 8-bit include four analog inputs and one analog output provide output voltage, output current and internal temperature via I2C bus.

PCF8591 Slave Address byte

1	0	0	1	A2	A1	A0	r/w

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Control byte

The second byte sent to a PCF8591 will be stored in its control register and is required to control the device function

The control bit for four single-ended inputs (programming we use) is as follows.

	msb							lsb
Bit	7	6	5	4	3	2	1	0
Rate	0	0	X	X	0	X	X	X
Voltage	0	0	0	0	0	0	0	0
Current	0	0	0	0	0	0	0	1
Temperature	0	0	0	0	0	0	1	0
N.C	0	0	0	0	0	0	1	1

Resolution and Accuracy

PS-1648	Range	Resolution	Accuracy
Output Voltage	0-60V	0.2344V/Bit	±2% of full scale
Output Current	0-33A	0.1289A/Bit	±10% of full scale
Internal Temperature	0-100°C	0.391°C/Bit	±3°C of full scale

A/D Conversion

Vout = bit rate x 0.2344(V)
Iout = bit rate x 0.1289(A)
Temperature = bit rate x 0.391(°C)

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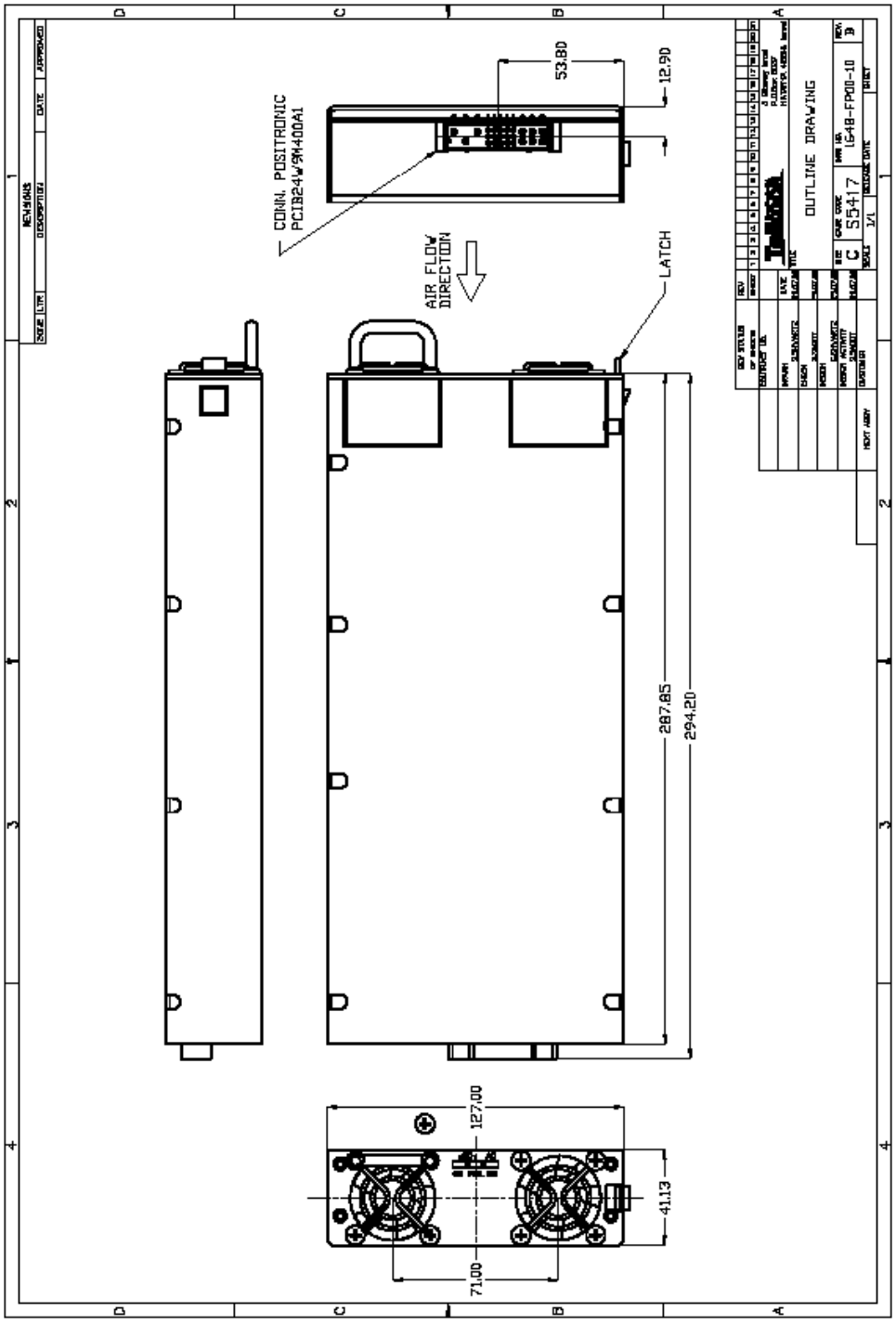
Outline Drawing



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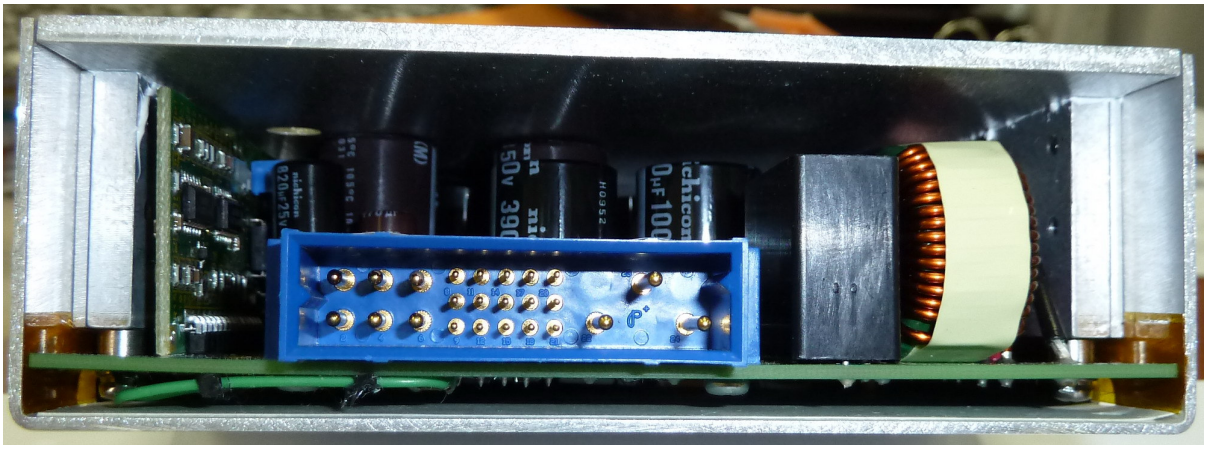
Pins Assignment

Pin #	Signal Name	Remarks
1,2,4	-48V RTN	48V Floating Positive output voltage
3,5,6	-48V	_48V Floating Negative output voltage
7	Enable (ON/OFF)	Turn the output to On and Off by electrical signal or dry contact Between pins 7 and pin 10(signal return) 0-0.6V or Short : On 2-15V or Open : Off The maximum sink current is 2.5mA
8	+SENSE	Positive sensing , Should be connected to the positive terminal of the load.
9	DC _ OK	Open collector referenced to pin 10, Active high when Vout less than 80%± 5%. The maximum sink current is 10mA and maximum external voltage is 15V
10	12V_GND Signal _ Return	Return for he following control and supervisory signals : On/Off , DC_OK , Over_ Temperature Alarm, AC Fail , Auxiliary 12V supply The Signal Return is isolated from the output terminals
11	AC _ FAIL	Open collector referenced to pin 10, Active high when Vin less than 80Vrms ± 5%. The maximum sink current is 10mA and maximum external voltage is 15V
12	Over Temperature Warning	Open collector referenced to pin 10, Active high when the internal temperature is 10ºC below thermal shut down. The maximum sink current is 10mA and maximum external voltage is 15V
13	-SENSE	Negative Sensing, Should be connected to the negative terminal of the load.
14	N.C	Spare pin
15	Current Share	Current Sharing Signal , When units are connected in parallel ,the CS pins of the units should be connected to allow current balance Between the units
16	+12V Auxiliary	Auxiliary voltage output 11.5 to 12.5V referenced to pin 10.
17	SDA	Serial Data used in the I2C interface option.
18	SCL	Serial Clock used in the I2C interface option.
19	A0	I2C interface address line
20	A1	I2C interface address line
21	A2	I2C interface address line
22	AC Ground	AC ground connection ,
23	AC Phase	AC line connection
24	AC Neutral	AC neutral connection

Front Panel

Rear Panel



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