PROTEK

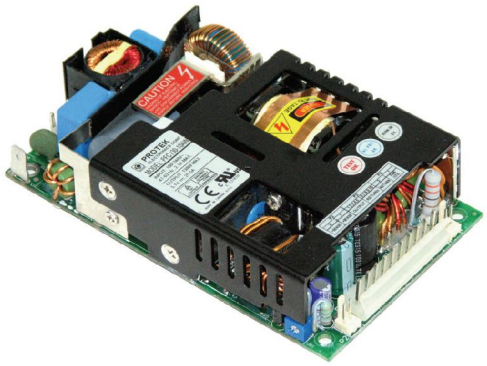
130 WATT POWER FACTOR CORRECTED SUPPLIES

DESCRIPTION

The PFC130 series incorporates creative high efficiency circuitry, high power density (6.94 Watts/in^3) and active Power Factor Correction (PFC) to meet the requirements of data networking, computing and telecommunication systems.

PFC130 SERIES
(SINGLE OUTPUT)

CE (LVD)
RoHS



FEATURES

- **EN61000-3-2 class A and D compliant**
- **Power factor 0.98 typical**
- **Very compact size, 3″×5″×1.2″**
- **Overvoltage protection**
- **Short circuit protection**
- **Remote sense**
- **Compliant with RoHS requirements**

INPUT SPECIFICATIONS

Input voltage :	90 to 264VAC
Input frequency :	47 to 63Hz
Input current :	2.1A（rms）max. for 115VAC 1.1A（rms）max. for 230VAC
Earth leakage current: (Touch current)	0.3mA max. @ 115VAC, 60Hz 0.6mA max. @ 230VAC, 50Hz

Safety Standard Approvals :

UL 60950-1, CSA C22.2 NO. 60950-1
File NO. E137410

TÜV Rheinland

TÜV EN60950-1
Certificate No. R 50047833

OUTPUT SPECIFICATIONS

Output voltage/current :	See Rating Chart
Ripple and noise :	2% peak to peak on 5.1V model 1% peak to peak on other models.
Overvoltage protection :	Provided on output set at 112–132% of its nominal output voltage
Overcurrent protection :	Protected to short circuit conditions
Temperature coefficient :	All outputs ± 0.04% /℃ maximum
Transient response :	Maximum excursion of 4% or better on all models; recovering to 1% of final value within 500us after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature :	-10℃ to +60℃
Storage temperature :	-40℃ to +85℃
Relative humidity :	5% to 95% non-condensing
Derating :	Derate from 100% at +40℃ linearly to 50% at +60℃
Cooling :	10 CFM total forced air from two 40mm diameter fans or the like is required and provided by user

GENERAL SPECIFICATIONS

Switching frequency :	110KHz ±15KHz
Power factor :	0.98 typical
Efficiency :	72% typical on 5.1V output, 76% typical on other outputs
Hold-up time :	15 msec minimum at 115VAC
Line regulation :	±0.5% maximum at full load
Inrush current :	35 amps @ 115VAC or 70 amps @ 230VAC at 25℃ cold start
Withstand voltage :	3000VAC from input to output 1500VAC from input to ground 500VAC from output to ground
MTBF :	200,000 hours minimum

EMC Performance (EN55024)

EN55022:	Class B conducted, Class A radiated
FCC Part 15	Class B conducted, Class A radiated
VCCI:	Class B conducted, Class A radiated
EN61000-3-2:	Harmonic distortion, Class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8KV air and ± 4KV contact
EN61000-4-3:	Radiated immunity, 3V/m
EN61000-4-4:	Fast transient/burst, ± 1KV
EN61000-4-5:	Surge, ± 1KV diff., ± 2KV com.
EN61000-4-6:	Conducted immunity, 3Vrms
EN61000-4-8:	Magnetic field immunity, 1A/m
EN61000-4-11:	Voltage dips, 30% reduction for 500ms and >95% reduction for 10ms

PROTEK

130 WATT POWER FACTOR CORRECTED SUPPLIES

DESCRIPTION

The PFC130 series incorporates creative high efficiency circuitry, high power density (6.94 Watts/in^3) and active Power Factor Correction (PFC) to meet the requirements of data networking, computing and telecommunication systems. Some models with one or two outputs adjustable between 5V and 24V intend to suit more applications.

PFC130 SERIES
(MULTIPLE OUTPUT)

CE (LVD)
RoHS

New!!

FEATURES

- **EN61000-3-2 class A and D compliant**
- **Power factor 0.98 typical**
- **Very compact size, 3"×5"×1.2"**
- **Overvoltage protection**
- **Short circuit protection**
- **Remote sense on 3.3V output**
- **Power Good/Power Fail Detect Signal**
- **Up to five DC outputs**
- **All outputs well regulated**
- **Compliant with RoHS requirements**

Safety Standard Approvals :

c UL us — **UL 60950 3rd, CSA C22.2 NO. 60950 3rd**
File No. E137410

TÜV Rheinland — **TÜV EN60950-1**
Certificate No. R 50024200

INPUT SPECIFICATIONS

Input voltage :	90 to 264VAC
Input frequency :	47 to 63Hz
Input current :	2.1A (rms) max. for 115VAC 1.1A (rms) max. for 230VAC
Earth leakage current : **(Touch current)**	0.3mA max. @ 115VAC, 60Hz 0.6mA max. @ 230VAC, 50Hz

ENVIRONMENTAL SPECIFICATIONS

Operating temperature :	-10℃ to +60℃
Storage temperature :	-40℃ to +85℃
Relative humidity :	5% to 95% non-condensing
Derating :	Derate from 100% at +40℃ linearly to 50% at +60℃
Cooling :	10 CFM total forced air from two 40mm diameter fans or the like is required and provided by user.

OUTPUT SPECIFICATIONS

Output voltage/current :	See Rating Chart
Ripple and noise :	65mV peak to peak on V1,1% peak to peak on other outputs
Overvoltage protection :	Provided on V0 & V1; set at 112–132% of its nominal output voltage
Overcurrent protection :	All outputs protected to short circuit conditions
Temperature coefficient :	All outputs ±0.04/℃ maximum
Transient response :	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500us after a 25% step load change
PG/PFD signal :	TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 10ms prior to master output dropping 5% below its nominal value. This signal also provides a minimum delay of 100ms after master output is within regulation

GENERAL SPECIFICATIONS

Switching frequency :	100KHz ±10KHz
Power factor :	0.98 typical
Efficiency :	75% typical
Hold-up time :	15 msec minimum at 115VAC
Line regulation :	±0.5% maximum at full load
Inrush current :	35 amps @ 115VAC or 70 amps @ 230VAC at 25℃ cold start
Withstand voltage :	3000VAC from input to output 1500VAC from input to ground 500VAC from output to ground
MTBF :	200,000 hours minimum

EMC Performance (EN55024)

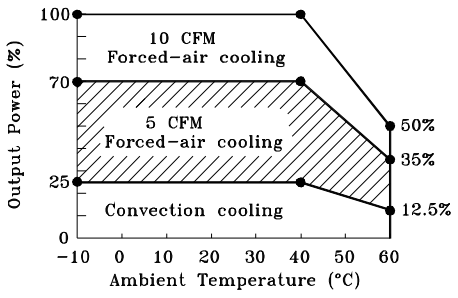
EN55022:	Class B conducted, Class A radiated
FCC Part 15	Class B conducted, Class A radiated
VCCI:	Class B conducted, Class A radiated
EN61000-3-2:	Harmonic distortion, Class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ± 8KV air and ± 4KV contact
EN61000-4-3:	Radiated immunity, 3V/m
EN61000-4-4:	Fast transient/burst, ± 1KV
EN61000-4-5:	Surge, ± 1KV diff., ± 2KV com.
EN61000-4-6:	Conducted immunity, 3Vrms
EN61000-4-8:	Magnetic field immunity, 1A/m
EN61000-4-11:	Voltage dips, 30% reduction for 500ms and >95% reduction for 10ms

OUTPUT VOLTAGE/CURRENT RATING CHART

(1)(2)(5)(6)	V1(3)				V2				V3 (4)				V4 (4)				VO			
MODEL	Vnom.	5CFM Imax.	10CFM Imax.	Tol.	Vnom.	5CFM Imax.	10CFM Imax.	Tol.	Vnom.	5CFM Imax.	10CFM Imax.	Tol.	Vnom.	5CFM Imax.	10CFM Imax.	Tol.	Vnom.	5CFM Imax.	10CFM Imax.	Tol.
PFC130-23-3A	+5.1V	8A	12A	2%				(N/A)				(N/A)				(N/A)	+3.3V	8A	12A	2%
PFC130-23A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%		(N/A)				(N/A)				(N/A)		
PFC130-24A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%		(N/A)				(N/A)				(N/A)		
PFC130-25A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%		(N/A)				(N/A)				(N/A)		
PFC130-31A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%	+5V~+24V	0.5A	1A	2%		(N/A)				(N/A)		
PFC130-32A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%	+5V~+24V	0.5A	1A	2%		(N/A)				(N/A)		
PFC130-33A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%	+5V~+24V	0.5A	1A	2%		(N/A)				(N/A)		
PFC130-34A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%		(N/A)			–5V~–24V	0.5A	1A	2%		(N/A)		
PFC130-35A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%		(N/A)			–5V~–24V	0.5A	1A	2%		(N/A)		
PFC130-36A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%		(N/A)			–5V~–24V	0.5A	1A	2%		(N/A)		
PFC130-31-3A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%		(N/A)				(N/A)			+3.3V	8A	12A	2%
PFC130-33-3A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%		(N/A)				(N/A)			+3.3V	8A	12A	2%
PFC130-39-3A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%		(N/A)				(N/A)			+3.3V	8A	12A	2%
PFC130-41A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%	+5V~+24V	0.5A	1A	2%	–5V~–24V	0.5A	1A	2%		(N/A)		
PFC130-42A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%	+5V~+24V	0.5A	1A	2%	–5V~–24V	0.5A	1A	2%		(N/A)		
PFC130-43A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%	+5V~+24V	0.5A	1A	2%	–5V~–24V	0.5A	1A	2%		(N/A)		
PFC130-41-3A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%	+5V~+24V	0.5A	1A	2%		(N/A)			+3.3V	8A	12A	2%
PFC130-42-3A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%	+5V~+24V	0.5A	1A	2%		(N/A)			+3.3V	8A	12A	2%
PFC130-43-3A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%	+5V~+24V	0.5A	1A	2%		(N/A)			+3.3V	8A	12A	2%
PFC130-44-3A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%		(N/A)			–5V~–24V	0.5A	1A	2%	+3.3V	8A	12A	2%
PFC130-45-3A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%		(N/A)			–5V~–24V	0.5A	1A	2%	+3.3V	8A	12A	2%
PFC130-46-3A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%		(N/A)			–5V~–24V	0.5A	1A	2%	+3.3V	8A	12A	2%
PFC130-51-3A	+5.1V	8A	12A	2%	+12V	3.25A	6A	3%	+5V~+24V	0.5A	1A	2%	–5V~–24V	0.5A	1A	2%	+3.3V	8A	12A	2%
PFC130-52-3A	+5.1V	8A	12A	2%	+15V	2.6A	4.8A	3%	+5V~+24V	0.5A	1A	2%	–5V~–24V	0.5A	1A	2%	+3.3V	8A	12A	2%
PFC130-53-3A	+5.1V	8A	12A	2%	+24V	1.63A	3A	3%	+5V~+24V	0.5A	1A	2%	–5V~–24V	0.5A	1A	2%	+3.3V	8A	12A	2%

NOTES:

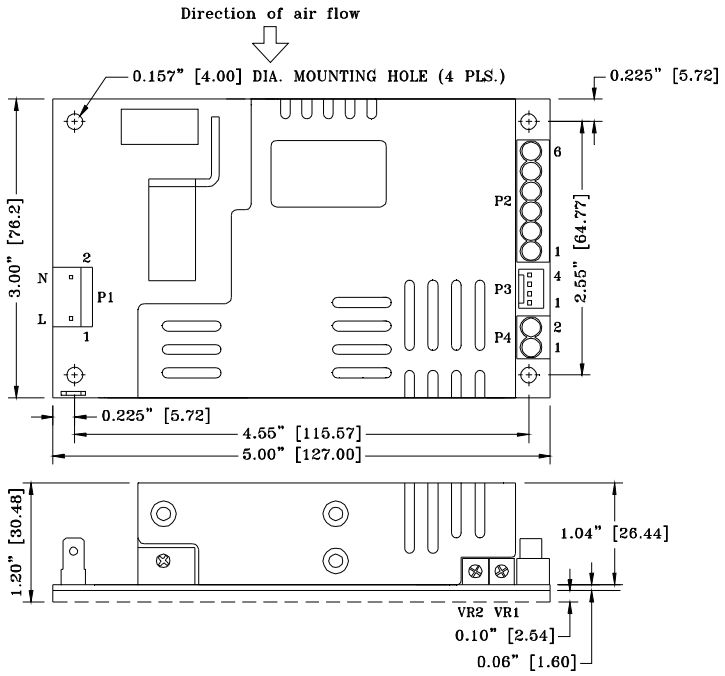
1. The outputs of each model are from two independent channels. Channel #1 consists of the main output V1 and auxiliary output V0. Channel #2 consists of the main output V2 and auxiliary outputs V3 and V4. The maximum output power that may be drawn from each channel is 45W with 5 CFM forced-air cooling or 65W with 10 CFM forced-air cooling. The derating curve on right provides guidelines on application within the specified operating temperature range.
2. "5 CFM Imax." ("10 CFM Imax.") is the maximum current of individual output when 5 CFM (10 CFM) forced air is provided. Under a specific cooling condition, both the maximum output power stated in note #1 and the maximum current of individual output must not be exceeded.
3. V1 needs a minimum current of 0.8A to support output V0 at its maximum rated load.



DERATING CURVE

4. The total output power of V3 and V4 should not exceed 30W. V3 is adjustable between +5V and +24V, and set at +12V as standard. V4 is adjustable between –5V and –24V, and set at –12V as standard. It is welcome to consult factory for the two outputs to be set at wanted voltages within the adjustable ranges.
5. Ripple and noise measured peak to peak across a 20MHz bandwidth by using a 12 inch twisted pair terminated with a 10uF tantalum capacitor in parallel with a 0.1uF ceramic capacitor.
6. "Tol." Is output voltage tolerance which includes initial set-up error, thermal drift, line regulation, load regulation and cross regulation.

MECHANICAL SPECIFICATIONS



NOTES:

1. Dimensions shown in inch [mm]
2. Tolerance 0.02 [0.5] maximum
3. Connector P1 mates with Molex housing 09-50-3031 and Molex 2878 series crimp terminal.
4. Connectors P2 and P4 are suitable for AWG#18~AWG#12 electric wires.
5. Connector P3 mates with Molex housing 22-01-1043 and Molex 40445 series crimp terminal.
6. Weight: 0.43 kgs. (0.95 lbs.) approx.
7. Potentiometers for output voltage adjustments: VR1 for V1, VR2 for V0, VR3 for V3, VR4 for V4 (VR3 and VR4 being SMD type on trace side)

PIN CHART

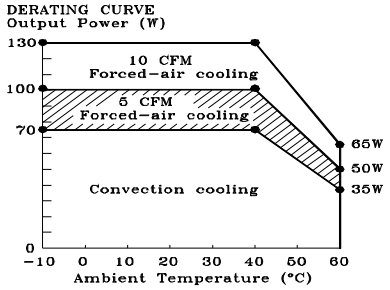
CONN / PIN / MODEL	P1		P2						P3				P4	
	1	2	1	2	3	4	5	6	1	2	3	4	1	2
PFC130-23-3A	AC LIVE	AC NEUTRAL	V1	COM. RET.	COM. RET.	N.C.	N.C.	N.C.	−SENSE (VO)	+SENSE (VO)	PG/PFD Signal	COM. RET.	VO	COM. RET
PFC130-23A PFC130-24A PFC130-25A								V2	N.C.	N.C.			VOID	
PFC130-31A PFC130-32A PFC130-33A	AC LIVE	AC NEUTRAL	V1	COM. RET.	COM. RET.	V3	N.C.	V2	N.C.	N.C.	PG/PFD Signal	COM. RET.	VOID	
PFC130-34A PFC130-35A PFC130-36A						N.C.	V4							
PFC130-31-3A PFC130-33-3A PFC130-39-3A							N.C.		−SENSE (VO)	+SENSE (VO)			VO	COM. RET.
PFC130-41A PFC130-42A PFC130-43A	AC LIVE	AC NEUTRAL	V1	COM. RET.	COM. RET.	V3	V4	V2	N.C.	FAN	PG/PFD Signal	COM. RET.	VOID	
PFC130-41-3A PFC130-42-3A PFC130-43-3A							N.C.		−SENSE (VO)	+SENSE (VO)			VO	COM. RET.
PFC130-44-3A PFC130-45-3A PFC130-46-3A						N.C.	V4							
PFC130-51-3A PFC130-52-3A PFC130-53-3A	AC LIVE	AC NEUTRAL	V1	COM. RET.	COM. RET.	V3	V4	V2	−SENSE (VO)	+SENSE (VO)	PG/PFD Signal	COM. RET.	VO	COM. RET.

OUTPUT VOLTAGE/CURRENT RATING CHART

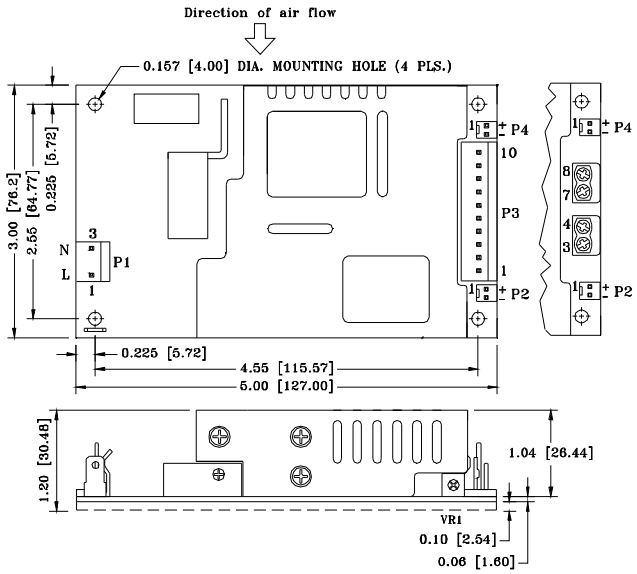
MODEL	Vnom.	Output Imin.	Output Imax.	Tol.	Maximum Output Power (1)
PFC130-10A	5.1V	0.7A	25.5A	2%	130W
PFC130-12A	12V	0.5A	10.8A	2%	130W
PFC130-13A	15V	0.5A	8.7A	2%	130W
PFC130-13-1A	18V	0.5A	7.2A	2%	130W
PFC130-14A	24V	0.4A	5.4A	2%	130W
PFC130-16A	30V	0.4A	4.3A	2%	130W
PFC130-17A	36V	0.3A	3.7A	2%	130W
PFC130-18A	48V	0.3A	2.7A	2%	130W

NOTES:

1. 130 watts maximum at 10 CFM forced air cooling.
2. Ripple and noise is measured peak to peak across a 20MHz bandwidth by using a 12 inch twisted pair terminated with a 10uF tantalum capacitor in parallel with a 0.1uF ceramic capacitor.
3. Suffix codes for over-temperature protection function and output connector are as follows. PFC130-X1 X2 X3, “X1” is the model code from the above table, “X2” is the over-temperature protection function (Blank=without over-temperature protection, W=with over-temperature protection), “X3” is output connector (Blank=Molex KK type, T=miniature terminal blocks), e.g. PFC130-13-1AW (18V output voltage, with over-temperature protection, Molex KK type).



MECHANICAL SPECIFICATIONS



NOTES:

1. Dimensions shown in inch [mm]
2. Tolerance 0.02 [0.5] maximum
3. Connector P1 mates with Molex housing 09-50-3031 and Molex 2878 series crimp terminal.
4. Molex KK type connectors:
   Connector P3 mates with Molex housing 09-50-3101 and Molex 2878 series crimp terminal.
5. Miniature terminal blocks: Connector P3 is suitable for AWG#18~AWG#12 electric wires.
6. Connector P2, P4 mates with Molex housing 22- 01-1023 and Molex 40445 series crimp terminal.
7. Weight: 0.38 kgs (0.84 lbs.) approx.
8. Potentiometer (VR1) is for output voltage adjustment.

PIN CHART

CONN / MINI TERMINAL / MOLEX CONNECTOR / MODEL	P1			P2		P3										P4	
						Void	Void	3	4	Void	Void	7	8	Void	Void		
	1	2	3	1	2	1	2	3	4	5	6	7	8	9	10	1	2
PFC130-10A PFC130-12A PFC130-13A PFC130-13-1A PFC130-14A PFC130-16A PFC130-17A PFC130-18A	AC LIVE	Void	AC NEUTRAL	+SENSE	-SENSE	OUTPUT					RETURN					FAN (12V)	RET.