

Component Power DC-DC Modules

50-700 Watts CPM Series



THE XPERTS IN POWER

- Low Profile
- Industry Standard Footprint
- Wide Operating Temperature
- Parallel Operation
- Remote ON/OFF
- Adjustable Output
- Overvoltage & Overload Protection

Specification

Input

- Input Voltage**
- 18-36 VDC
 - 36-76 VDC
 - 45-160 VDC
 - 88-370 VDC
 - 200-400 VDC (see tables)

Output

- Output Voltage**
- See Tables
- Output Voltage Adjustment**
- $\pm 10\%$ CPM50 & 100, 60-110% CPM150, CPM200 & CPM400, 80-110% CPM600
- Minimum Load**
- No minimum load required
- Start Up Delay**
- 200 ms max (100% load)
- Initial Set Accuracy**
- $\pm 4.0\%$ max
- Drift**
- $\pm 0.5\%$ max
- Line Regulation**
- $\pm 0.5\%$ max
- Load Regulation**
- $\pm 0.9\%$ max
- Ripple & Noise**
- 200 mV pk-pk (0°C to +85°C)
- Overload Protection**
- Operates at >105% of rated current, recovers automatically
- Overvoltage Protection**
- Operates at between 115-140% of rating recycle input to reset
- Remote Sense**
- Compensates for 300mV min if not required then sense connections must be made locally ie +S to +Vout and -S to -Vout
- Remote ON/OFF**
- Standard on all models

General

- Efficiency**
- Up to 89% dependant on model
- Isolation**
- 3 kVAC Input to Output
 - 2 kVAC Input to Baseplate
 - 500 VDC Output to Baseplate
- Switching Frequency**
- 500 kHz - CPM50 & 100
 - 370 kHz - CPM150, CPM200, 400 & 600
- Parallel Operation**
- Current share pin provided on all except 50 W models, derate max current by 10% per module

Environmental

- Operating Temperature**
- -10 °C to +85°C CPM50 & CPM100, -20 °C to +85°C CPM150, CPM200, CPM400 & CPM600 (baseplate)
- Storage Temperature**
- -40 °C to +85 °C
- Relative Humidity**
- 20-95% non-condensing
- Shock**
- 20 G for 11 ms once each along X, Y & Z axis
- Vibration**
- 10-55 Hz 5 G for 3 min periods, over 60 mins along each X, Y & Z axis

Safety

- Emissions**
- EN55022 Level A conducted
 - EN55022 Level A radiated
 - Contact sales for Application Note
- ESD Susceptibility**
- EN61000-4-2 Level 2
- Radiated Susceptibility**
- EN61000-4-3 Level 3
- EFT/Burst**
- EN61000-4-4 Level 3
- Surge**
- EN61000-4-5 Level 3
- Safety Approvals**
- UL1950, C-UL, EN60950, VDE0160 IEC950

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OUTPUT VOLTAGE & CURRENT RATINGS - 50 & 100 WATT MODELS

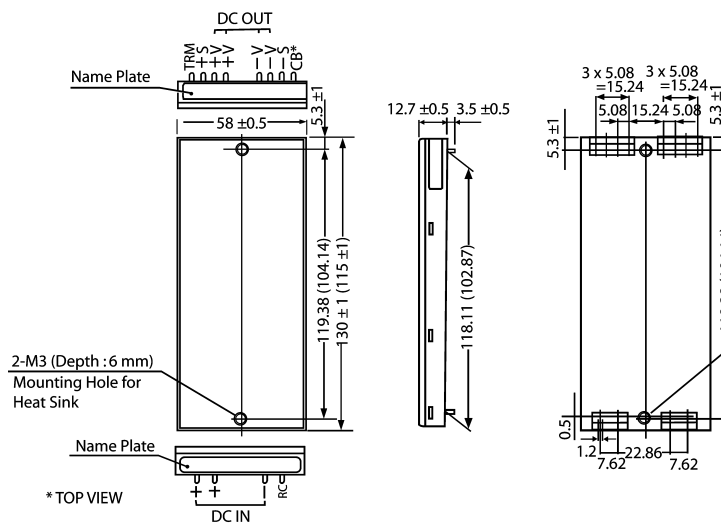
CPM

Output Power	Input Voltage	Output Voltage ⁽²⁾	Output Current	Regulation		Ripple & Noise ⁽¹⁾	Efficiency	Model Number
				Line	Load			
50 W	88-370 VDC ⁽³⁾	5 V	10.0 A	20 mV	40 mV	150 mV	82%	CPM50FS05
50 W	36-72 VDC	5 V	10.0 A	20 mV	40 mV	150 mV	80%	CPM5048S05
50 W	88-370 VDC ⁽³⁾	12 V	4.2 A	48 mV	100 mV	200 mV	82%	CPM50FS12
50 W	36-72 VDC	12 V	4.2 A	48 mV	100 mV	200 mV	82%	CPM5048S12
50 W	88-370 VDC ⁽³⁾	24 V	2.1 A	96 mV	150 mV	200 mV	82%	CPM50FS24
100 W	88-370 VDC ⁽³⁾	5 V	20.0 A	20 mV	40 mV	150 mV	82%	CPM100FS05
100 W	36-72 VDC	5 V	20.0 A	20 mV	40 mV	150 mV	80%	CPM10048S05
100 W	88-370 VDC ⁽³⁾	12 V	8.5 A	48 mV	100 mV	200 mV	82%	CPM100FS12
100 W	36-72 VDC	12 V	8.5 A	48 mV	100 mV	200 mV	82%	CPM10048S12
100 W	88-370 VDC ⁽³⁾	24 V	4.2 A	96 mV	150 mV	200 mV	82%	CPM100FS24

Notes

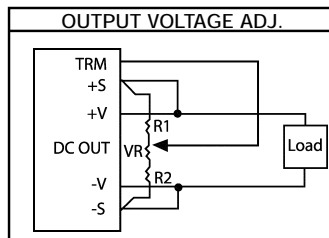
1. Measured with 220 μ F capacitor at the output at 20 MHz bandwidth (0 °C to +85 °C).
2. Fixed (TRM pin open) \pm 10% adjustable by external VR.
3. 85-264 VAC with the CPH500 - See CPH Series.

Mechanical Details & Application Notes - 50 & 100 Watt Models



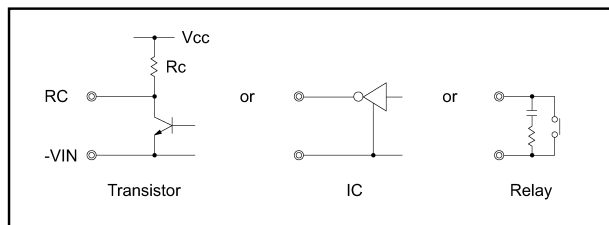
Pin	Connection	Function
1	DC IN +	Positive Input Voltage
2	DC IN +	1 & 2 are internally connected
3	DC IN -	Negative Input Voltage
4	RC	Remote Control
5	TRM	Ext. Adjustment of Output Voltage
6	+S	+ Remote Sensing Terminal
7	DC OUT +	Positive Output Voltage
8	DC OUT +	7 & 8 are internally connected
9	DC OUT -	Negative Output Voltage
10	DC OUT -	9 & 10 are internally connected
11	-S	- Remote Sensing Terminal
12	CB	Current Balance Terminals for Parallel Operation

- NOTES:**
1. All dimensions in mm tolerance \pm 0.3 mm.
 2. Dimensions in brackets - CPM50.
 3. Weight CPM50 = 120 g, CPM100 = 150 g



CPM50 EXTERNALLY MOUNTED PARTS			
Output Voltage	Value of externally mounted resistors (Ω)		
	VR	R1	R2
5	1 K	0 Ω	0 Ω
12	1 K	820	0 Ω
24	1 K	2.4 K	0 Ω

CPM100 EXTERNALLY MOUNTED PARTS			
Output Voltage	Value of externally mounted resistors (Ω)		
	VR	R1	R2
5	1 K	110	180
12	2 K	2.4 K	240
24	5 K	11 K	390



Remote Control

The remote control circuit is controlled by using the RC and -ve DC IN terminals - example circuit shown opposite.

1. Between RC and -ve DC IN - terminals: "Low" level or short circuited (0-1.2 V) - Output: ON.
2. Between RC and -ve DC IN - terminals: "High" level or open circuited (2.4-5.5 V) - Output: OFF.
3. Output current from the RC terminal is 1 mA typical when the voltage at the RC terminal is at low level.

Short-circuit the RC and -ve DC IN - terminal to disable remote control.



OUTPUT VOLTAGE & CURRENT RATINGS - 100, 150, 200 & 400 WATT MODELS CPM

Output Power	Input Voltage	Output Voltage ⁽²⁾	Output Current	Regulation		Ripple & Noise Pk-Pk ⁽¹⁾	Efficiency ⁽³⁾	Model Number
				Line	Load			
100 W	45-160 VDC	13.8 V	7.3 A	60 mV	150 mV	150 mV	83%	CPM100C2S13
150 W	66-160 VDC	12.0 V	12.5 A	40 mV	150 mV	150 mV	87%	CPM150C2S12
150 W	66-160 VDC	15.0 V	10.0 A	60 mV	150 mV	150 mV	86%	CPM150C2S15
151 W	66-160 VDC	24.0 V	6.3 A	95 mV	190 mV	150 mV	87%	CPM150C2S24
165 W	200-400 VDC ⁽⁴⁾	3.3 V	50.0 A	16 mV	30 mV	100 mV	79%	CPM200C3S03
200 W	200-400 VDC ⁽⁴⁾	5.0 V	40.0 A	20 mV	40 mV	100 mV	83%	CPM200C3S05
210 W	200-400 VDC ⁽⁴⁾	7.5 V	28.0 A	30 mV	60 mV	140 mV	86%	CPM200C3S07
240 W	200-400 VDC ⁽⁴⁾	12.0 V	20.0 A	40 mV	100 mV	150 mV	87%	CPM200C3S12
200 W	36-76 VDC	2.0 V	100.0 A	10 mV	20 mV	100 mV	73%	CPM40048S02
330 W	36-76 VDC	3.3 V	100.0 A	16 mV	30 mV	100 mV	80%	CPM40048S03
400 W	36-76 VDC	5.0 V	80.0 A	20 mV	40 mV	100 mV	84%	CPM40048S05
405 W	36-76 VDC	7.5 V	54.0 A	30 mV	60 mV	140 mV	87%	CPM40048S07
500 W	36-76 VDC	12.5 V	40.0 A	40 mV	100 mV	150 mV	89%	CPM40048S12
510 W	36-76 VDC	15.0 V	34.0 A	60 mV	150 mV	150 mV	89%	CPM40048S15
504 W	36-76 VDC	24.0 V	21.0 A	95 mV	190 mV	150 mV	89%	CPM40048S24
504 W	36-76 VDC	28.0 V	18.0 A	95 mV	190 mV	150 mV	89%	CPM40048S28
264 W	200-400 VDC ⁽⁴⁾	3.3 V	80.0 A	16 mV	30 mV	100 mV	79%	CPM400C3S03
400 W	200-400 VDC ⁽⁴⁾	5.0 V	80.0 A	20 mV	40 mV	100 mV	83%	CPM400C3S05
405 W	200-400 VDC ⁽⁴⁾	7.5 V	54.0 A	30 mV	60 mV	140 mV	86%	CPM400C3S07
408 W	200-400 VDC ⁽⁴⁾	12.0 V	34.0 A	40 mV	100 mV	150 mV	87%	CPM400C3S12
405 W	200-400 VDC ⁽⁴⁾	15.0 V	27.0 A	60 mV	150 mV	150 mV	87%	CPM400C3S15
396 W	200-400 VDC ⁽⁴⁾	18.0 V	22.0 A	60 mV	150 mV	150 mV	89%	CPM400C3S18
408 W	200-400 VDC ⁽⁴⁾	24.0 V	17.0 A	95 mV	190 mV	150 mV	87%	CPM400C3S24
406 W	200-400 VDC ⁽⁴⁾	28.0 V	14.5 A	95 mV	190 mV	150 mV	88%	CPM400C3S28

OUTPUT VOLTAGE & CURRENT RATINGS - 600 WATT MODELS CPM

Output Power	Input Voltage	Output Voltage ⁽²⁾	Output Current	Regulation		Ripple & Noise Pk-Pk ⁽¹⁾	Efficiency ⁽³⁾	Model Number
				Line	Load			
600 W	18-36 VDC	12.5 V	48 A	40 mV	100 mV	150 mV	83%	CPM60024S12
616 W	18-36 VDC	28.0 V	22 A	95 mV	190 mV	150 mV	86%	CPM60024S28
700 W	36-76 VDC	12.5 V	56 A	40 mV	100 mV	150 mV	89%	CPM60048S12
700 W	36-76 VDC	28.0 V	25 A	95 mV	190 mV	150 mV	89%	CPM60048S28

Notes

1. Measured at 20 MHz bandwidth & 0 °C to +85 °C.
2. Fixed (TRM pin open) adjustable by external VR or external resistor.
3. Measured at full load with 24 in 48 Vin & 280 Vin.
4. Compatible with CPH Series to provide 85-264 VAC input - See CPH Series.

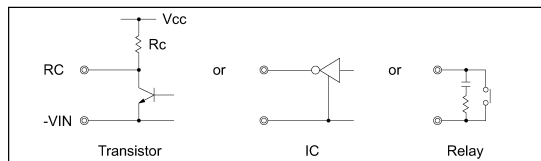
Application Notes

Remote ON/OFF

Remote ON/OFF circuits are built-in on both the input side (RC1) and output side (RC2 & RC3). The output can be controlled by either circuit.

Input Side Remote ON/OFF (RC1)

The ground pin of the input side Remote ON/OFF circuit is then '-V in' pin. Between RC1 and -V in the output voltage is ON at 'Low' level (0 - 1.0 V). Between RC1 and -V in the output voltage is OFF at 'High' level (3.5 - 7.0 V). When Remote ON/OFF function is not used, short between RC1 and -V in.

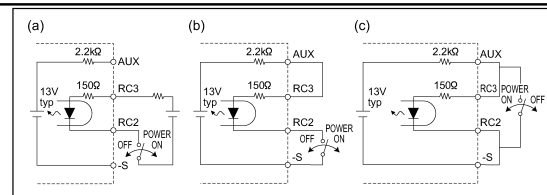


When the CPH Series (Power Factor & Harmonic Corrector Module) is used as a front end unit, connect between RC1-pin and PR-pin on CPH for the start-up timing of the CPM Series control.

Output Side Remote ON/OFF (RC2 & RC3)

Specification of output side remote ON/OFF (RC2-RC3)

No	Item	RC2-RC3		
1	Wiring method	Fig.1 (a)	Fig.1 (b)	Fig.1 (c)
2	Function	Power ON "H"	Power ON "H"	Power ON "L"
3	Base pin	RC2	-S	-S and RC2
4	Power ON	Open (0.1mA max)		Short (0.5 V max)
5	Power OFF	Short (3mA min)		Open (0.1mA max)



RC2-RC3 Connection Example

When output side remote ON/OFF function is used short between RC1 & -VIN.

Do not connect RC2 and RC3 if remote ON/OFF is not used. Make sure that sink current of output side remote ON/OFF circuit is be <12 mA.

Auxiliary power supply for remote ON/OFF (AUX)

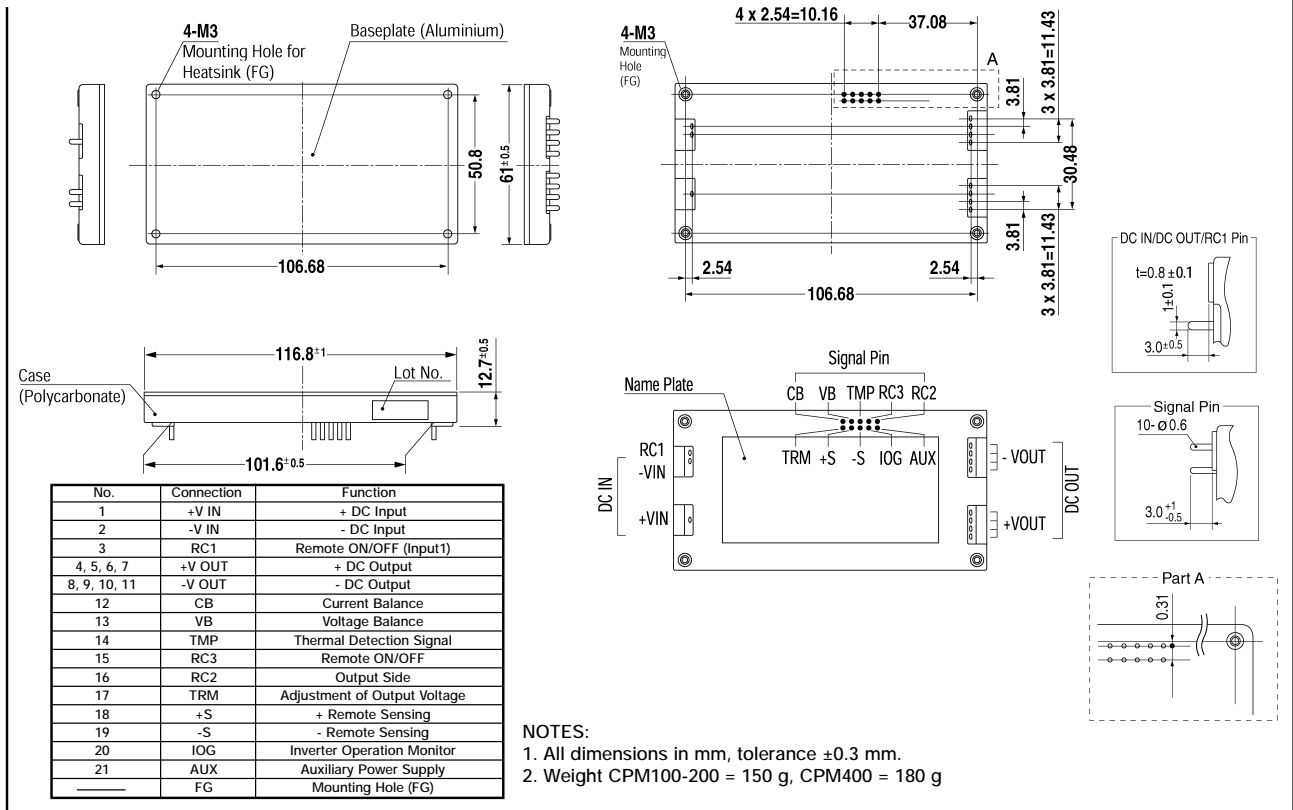
AUX is built in for operating the output side remote ON/OFF (RC2-RC3).

If AUX is not used for RC2-RC3, AUX can be used for IOG or TMP signal output by opto coupler.

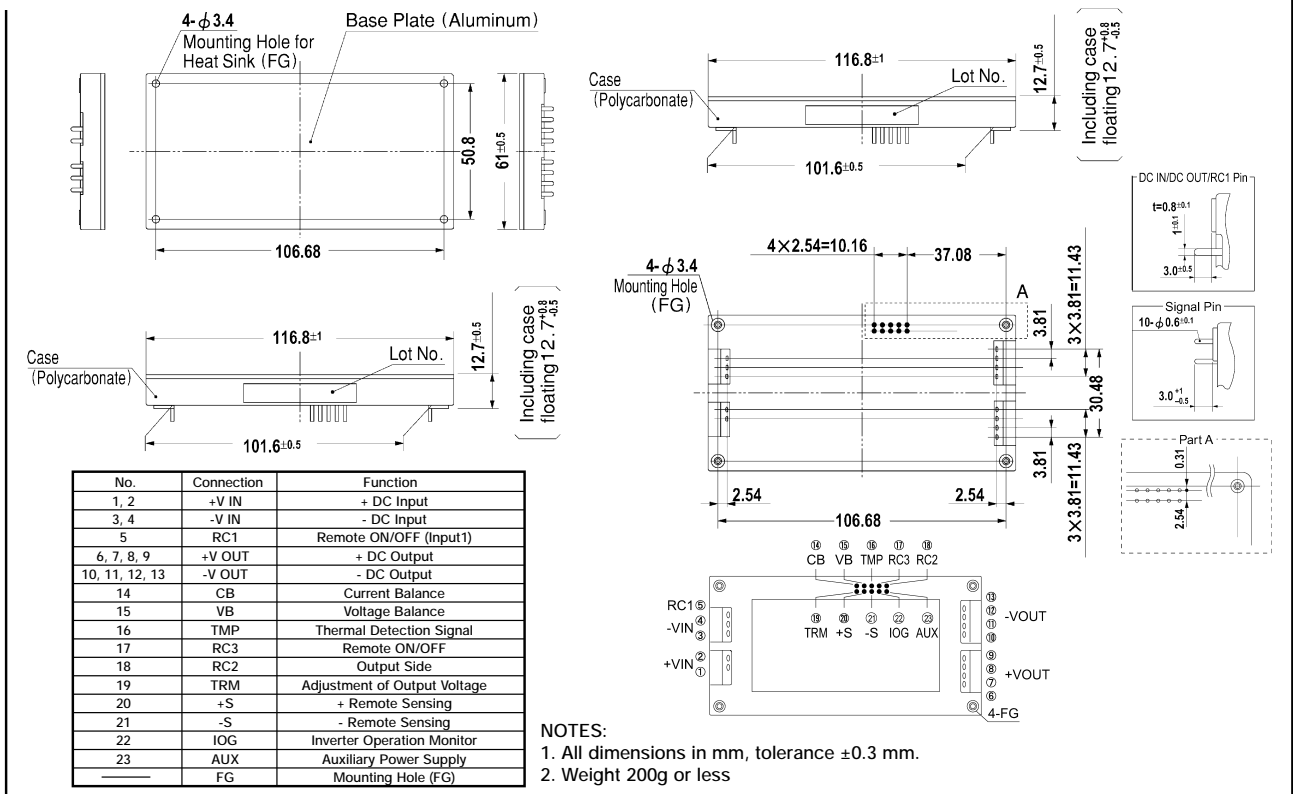
Short protection resistance (2.2kΩ) is built in.

Output voltage decreases as the output current increases. (AUX voltage at open circuit: 16V)

Mechanical Details - 100, 150, 200 & 400 Watt Models



Mechanical Details - 600 Watt Model



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