CCR750 series

XP Power

750W Fan cooled **600W** Conduction cooled **260W** Convection cooled

AC-DC power supplies

The CCR750 series of compact medical AC-DC power supplies are designed to operate in convection, conduction, and fan cooled applications with power ratings from 260W to 750W. CCR750 offers high efficiency and high power density in a low 25.4mm (1") profile, baseplate cooled design that ensures effective thermal management and quiet operation for noise sensitive applications.

Featuring Class B conducted and radiated emissions, worldwide industrial and medical safety approvals, 2 x MOPP isolation and low leakage currents, the CCR750 is designed for easy integration into a wide range of BF rated medical applications including respiratory care, imaging, patient monitoring, patient treatment, and industrial applications such as process control, test & measurement, and industrial printing.

Features

- 750W fan & conduction cooled, 600W conduction cooled
- Universal, single phase input: 85 to 264VAC (120 to 368VDC)
- 154.8 x 83.5mm footprint, 25.4mm profile
- High efficiency, up to 94%
- Low earth leakage <300µA
- Low patient leakage <90µA
- Medical (BF) & ITE safety approvals
- Class B conducted and radiated emissions
- 3 year warranty

Applications

Healthcare

Instrumentation

Process control

Robotics

Technology

Dimensions

154.8 x 83.5 x 25.4mm (6.09" x 3.29" x 1.00")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number	Output voltage	Output current			Efficiency[3]
		Convection cooled	Conduction cooled[1]	Fan cooled[2]	
CCR750PS12	12.0V	21.67A	50.00A	62.50A	92.0%
CCR750PS15	15.0V	17.33A	40.00A	50.00A	92.0%
CCR750PS24	24.0V	10.83A	25.00A	31.25A	92.5%
CCR750PS28	28.0V	9.29A	21.43A	26.78A	92.5%
CCR750PS30	30.0V	8.67A	20.00A	25.00A	93.0%
CCR750PS36	36.0V	7.22A	16.66A	20.83A	93.0%
CCR750PS48	48.0V	5.42A	12.50A	15.62A	93.5%
CCR750PS54	54.0V	4.81A	11.11A	13.88A	94.0%

Notes:

1. Thermal resistance for conduction cooling ≤1.5°C/W.
2. Requires a combination of 37m³/h (22CFM) and ≤1.5°C/W baseplate.
3. Typical value at 230VAC input and 750W load at +25°C.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage - operating	85[1]	115/230	264	VAC	Derate output from 750W at 120VAC to 600W at 85VAC – fan & conduction cooled
					Derate output from 650W at 115VAC to 500W at 85VAC – fan cooled
					Derate output from 520W at 115VAC to 400W at 85VAC – conduction cooled
					Derate output from 260W at 115VAC to 180W at 85VAC – convection cooled
	120		368	VDC	
Input frequency	47	50/60	63	Hz	Agency approval, 47-63Hz
Power factor		0.98			230VAC, 100% load
Input current			10	A	100VAC, 100% load
Inrush current		30		A	240VAC cold start, +25°C
Earth leakage current			300	µA	264 VAC/60Hz
Input protection	T12.5A/250 V Internal fuse fitted in line and neutral.				

Notes:

1. Agency approval, 90-264VAC

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	12		54	VDC	See models and ratings table
Initial set accuracy			±1	%	Full load, 115/230VAC
Minimum load	No minimum load required				
Start up			2	s	115/230VAC full load
Hold up time	10			ms	115VAC full load at +25°C
Line regulation			±0.5	%	
Load regulation			±1.0	%	10-100% load
Transient response			4	%	Recovery within 1% in less than 500µs for a 75-100% and 100-75% load step
Output voltage adjustment		±5		%	28V model adjustment range is 0 to +5% 54V model adjustment range is -5% to +2%
Ripple & noise			1	%	12V model noise & ripple is 150mV Measured at 20MHz bandwidth and 10µF electrolytic capacitor in parallel with 0.1µF ceramic capacitor at +25°C
Overvoltage protection	110		150	%	Vnom, 48V & 54V model OVP <60V Recycle input to reset
Overload protection	150		220	%	Inom, auto recovery
Short circuit protection	Trip & restart, auto recovery				
Drift			±0.02	%	After 20 min warm up
Temperature coefficient			0.02	%/°C	
Overtemperature protection	Measured case temperature >105°C, auto resetting				

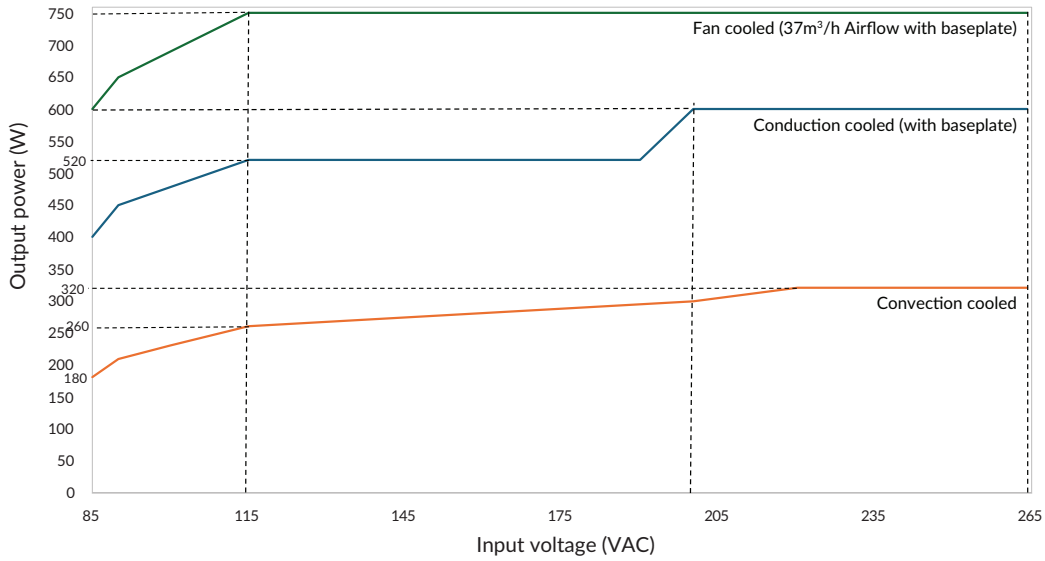
General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		94		%	See models and ratings table
Isolation: input to output	4000			VAC	2 x MOPP
input to ground	1800			VAC	1 x MOPP
output to ground	1500			VAC	1 x MOPP
Switching frequency		78		kHz	Main converter full load
		100		kHz	PFC full load
Power density			37.43	W/cm³	Fan & conduction cooled
Patient leakage current			90	µA	
Mean time between failure	280			khrs	MIL-HDBK-217F, +25°C GB.
Weight		600 (1.32)		g (lb)	

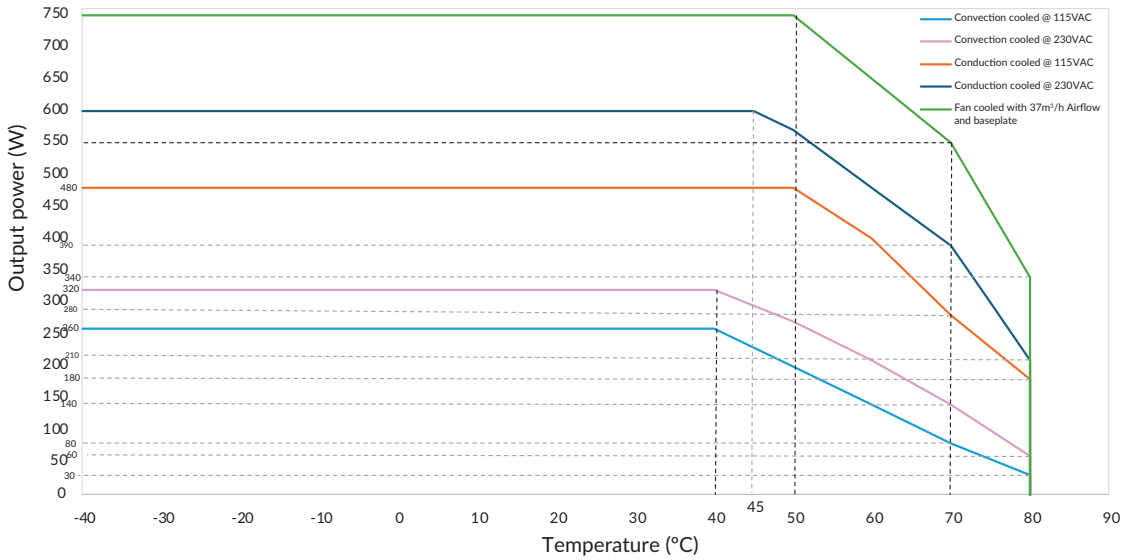
Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+80	°C	See derating curve
Storage temperature	-40		+85	°C	
Cooling	37 (22)			m³/h (CFM)	For fan cooled operation
Humidity	5		95	%RH	Non-condensing
Operating altitude			5000 / 2000	m	OVC II / OVC III
Vibration	Single axis 10-500Hz at 2g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6				
Shock	±3 x 30g shocks in each plane, total 18 shocks. 30g = 11ms (±0.5msecs), half sine. Conforms to EN60068-2-27				
Baseplate temperature			95	°C	When using conduction cooling, max baseplate temperature (measured at the center) is +95°C but some components are not thermally connected to the baseplate. The temperatures of these components may not exceed temperatures shown in the thermal considerations section on page 5.

Input derating curve



Thermal derating curve



Emissions - EMC

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032/EN55011	Class B	
Radiated	EN55032/EN55011	Class B	Class II only meets Class A
Harmonic currents	EN61000-3-2	Class A & C	
Voltage flicker	EN61000-3-3		

Emissions - immunity

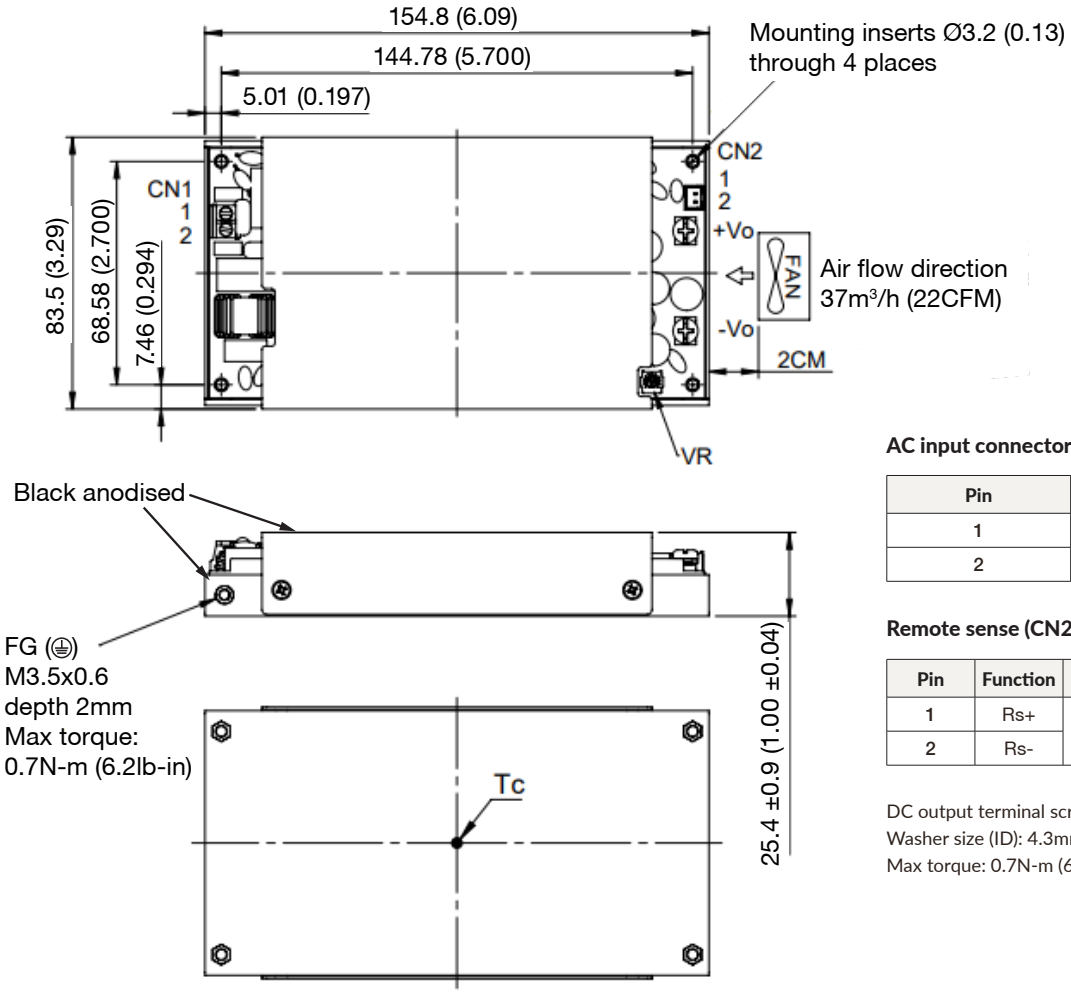
Phenomenon	Standard	Test level	Criteria	Notes & conditions
Medical device EMC	IEC60601-1-2	Ed.4.0 : 2014	as below	
Low voltage PSU EMC	EN55035		as below	
ESD immunity	EN61000-4-2	±15kV air, ±8kV contact	A	
Radiated immunity	EN61000-4-3	10V/m	A	
EFT/burst	EN61000-4-4	±2kV	A	
Surge	EN61000-4-5	Installation class 4	A	±2kV line to line, ±4kV line to earth
Conducted	EN61000-4-6	6V	A	
Magnetic field	EN61000-4-8	30A/m	A	
Dips and interruptions	EN55035 (115VAC)	Dip 100% (0VAC), 10ms	A	
		Dip 100% (0VAC), 20ms	A	
		Dip 30% (80.5VAC), 500ms	B	
		Dip 60% (46VAC), 100ms	B	
		Int. 100% (0VAC), 5000ms	B	
	EN55035 (230VAC)	Dip 100% (0VAC), 10ms	A	
		Dip 100% (0VAC), 20ms	A	
		Dip 30% (181VAC), 500ms	A	
		Dip 60% (92VAC), 100ms	A	
		Int. 100% (0VAC), 5000ms	B	
	EN60601-1-2 (100VAC)	Dip 100% (0VAC), 10ms	A	
		Dip 100% (0VAC), 20ms	A	
		Dip 30% (70VAC), 500ms	B	
		Int. 100% (0VAC), 5000ms	B	
	EN60601-1-2 (240VAC)	Dip 100% (0VAC), 10ms	A	
		Dip 100% (0VAC), 20ms	A	
		Dip 30% (168VAC), 500ms	A	
		Int. 100% (0VAC), 5000ms	B	

Safety approvals

Certification	Standard	Notes & conditions
CB report	IEC62368-1	Audio/video, information and communication technology equipment
	IEC60601-1	Medical
UL	UL62368-1	Audio/video, information and communication technology equipment
	ANSI/AAMI ES60601-1 & CSA C22.2 No.60601-1	Medical
EN	EN62368-1	Audio/video, information and communication technology equipment
	EN60601-1	Medical
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Isolation	Standard	Notes & conditions
Primary to Secondary	2 x MOPP (Means of Patient Protection)	Class I & II for both ITE & Medical
Primary to Earth	1 x MOPP (Means of Patient Protection)	
Secondary to Earth	1 x MOPP (Means of Patient Protection)	

Mechanical details



AC input connector (CN1): ECE ETB22

Pin	Function	Mating wire range
1	ACL	14-16AWG
2	ACN	

Remote sense (CN2): TKP 8822-02-NHB or equivalent

Pin	Function	Mating housing	Terminal
1	Rs+	JST XHP-2 or equivalent	JST SXH-001T-P0.6N or equivalent
2	Rs-		

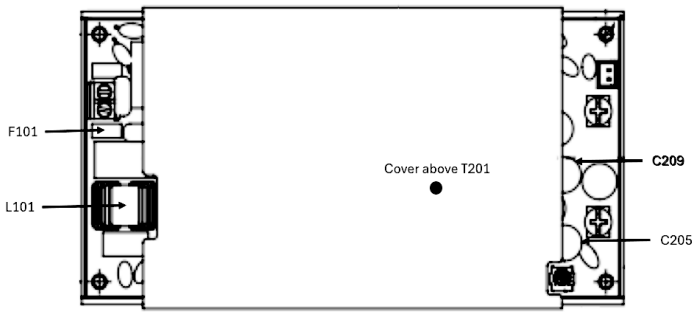
DC output terminal screws are M4.
Washer size (ID): 4.3mm (0.17") nom, (OD): 7.3mm (0.29") max
Max torque: 0.7N-m (6.2lb-in)

Notes:

1. All dimensions shown in mm (inches). Tolerance: ±0.5 (0.02).
2. Weight: Standard versions: 600g (1.32lbs) approx.

Thermal considerations

Temperature measurements (at maximum ambient)	
Component	**Max temperature °C**
L101	130°C
F101	125°C
C205	125°C
C209	125°C
Cover (above T201)	100°C
Baseplate (Tc)	95°C



In order to ensure safe operation of the PSU in the end-use equipment, the temperature of the components listed in the table must not be exceeded.
Temperature should be monitored using K type thermocouples placed on the hottest part of the component (out of direct air flow).