VCCM600 Series

AC/DC conduction cooled
configurable power supplies

Installation Manual

PLEASE READ THIS INSTALLATION MANUAL CAREFULLY BEFORE INSTALLING THIS PRODUCT AND KEEP THIS MANUAL FOR FUTURE REFERENCE.

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Important installation information

This VCCM600 series of configurable power supplies are intended for use within end customer applications which restrict access to un-authorized personnel. The instructions in this manual and all warning labels on the product must be adhered to carefully.

SAFETY	The VCCM600S and VCCM600M series are designed in accordance with the relevant safety requirements of IEC/EN/UL/CSA 62368-1, IEC/EN/UL/CSA 60950-1, IEC/EN/UL/CSA 60601-1, Low voltage Directive LVD 2014/35/EU and EMC directive EMC 2014/30/EU. All VCCM600 series power supplies must be installed correctly in a controlled environment which restricts access to any un-authorised personnel. Equipment and system manufacturers must protect service personnel against unintentional contact with the output terminals.
HAZZARDS	Dangerous voltages are present within the power supply. It should only be handled by qualified personnel when the power supply has been disconnected from the mains supply voltage for more than 3 minutes. External surfaces of the power supply may become extremely hot during and after operation. Appropriate care should be taken. If series and/or parallel combinations of outputs exceed safe voltage and/or energy levels, the final equipment manufacturer must provide the appropriate protection for both users and service personnel.
DE-RATINGS	Ambient Temperature: • The input module power must be de-rated by 2.5%/°C above 50°C ambient up to a maximum ambient temperature of 70°C. Baseplate Temperature: • The output module power and current must be de-rated by 2.5%/°C above 85°C baseplate up to a maximum baseplate temperature of 105°C. Input Voltage: • The input module power must be de-rated by 5W/V_{RMS} below120 V_{RMS} (600W @ 120 V_{RMS}, 450W @ 90 V_{RMS}) Remember to take the appropriate de-rating into consideration before specifying any VCCM600 power supply for an application. If in any doubt, please contact Vox Power directly or your local Vox Power representative.
HEALTH AND SAFETY	To comply with section 6 of the health and safety at work act, a label that is clearly visible to service personnel must be placed on the final equipment. These labels warn that surfaces of the power supply may be hot and should not be touched when the product is operating.
FUSING	The power supply has internal dual pole fusing. One fuse in each line. **Fuses are not replaceable.** Damaged units should be returned to Vox Power for analysis and repair. DC operation is not covered by safety approvals. Contact Vox Power for details.
SERVICING	The power supply contains no user serviceable parts. Repairs must be carried out by authorised personnel only. Contact Vox Power for further information.
APPROVAL LIMITATIONS	NORTH AMERICA - When this product is used with 180V_{AC}–253V_{AC} mains where no neutral is present, connect the two live wires to L (Live) and N (Neutral) on the input connector.
COOLING	For proper operation of the power supply, the user must ensure sufficient cooling to maintain all component temperatures within specifications. A thorough review of the user manual should be carried out for details of thermal performance.
EARTH TERMINAL MARKING	To comply with the requirements of IEC/EN/UL/CSA 62368-1, IEC/EN/UL/CSA 60950-1 & IEC/EN/UL/CSA 60601-1, where the incoming wiring earth is intended for connection as the main protective earth conductor and where the terminals for such a connection is not supplied on a component or subassembly, the user shall add an appropriate label displaying a protective earth symbol in accordance with IEC60417-5019 (2006-08) directly adjacent to the terminal. The label should be durable and legible and should withstand the 15 second rub test as per UL60950-1 section 1.7.15.
WARRANTY	Contact your sales agent or Vox Power for product repairs. See Vox Power standard terms and conditions for warranty conditions.
PRODUCT LABELS	The external product label contains information relevant to the power system. The label contains input voltage, maximum input current, input frequency, maximum output power, fuse rating and type, serial number, approvals and product part number in form VCCM600x-yyyy-zzz.
VCCM OUTPUT MODULES	Each output module label contains information relevant to that output. The label contains voltage adjustment range, maximum output current, serial number, approvals and the part number in format OPx.
OTHER	• A label warning that external surfaces are hot during operation and that the unit should be allowed to cool down properly should be placed on the unit where such a label is clearly visible. • The VCCM600 series is designed to comply with EMC standards but it does not imply that the end system will comply. • To prolong the life of the unit, use in dust free environment. • Units can sometimes be damaged during transit. In the event of transit damage, DO NOT connect power to the unit. Contact your sales agent or Vox Power. • Always use adequately sized cables and ensure good crimp connections. Use cable supports to minimise stress on connectors. • Avoid excessive shock or vibration.

Specifications

INPUT MODULE SPECIFICATION SUMMARY					
Parameter	Details	Min	Typical	Max	Units
AC Input Voltage	Nominal range is $100V_{RMS}$ to $240V_{RMS}$	85		264	V_{RMS}
AC Input Frequency	Contact factory for 400Hz operation.	47	50/60	63	Hz
DC Input Voltage	Not covered by safety approvals. Contact Vox Power.	120		370	V_{DC}
Output Power Rating	De-rate linearly from 600Watts at $120V_{RMS}$ to 425Watts at $85V_{RMS}$			600	Watts
Input Current	600Watts output at 120Vrms input			6	Amps
Fusing	Each line fused (5x20 Fast acting)			8	Amps
Power Factor			0.99		
Size	177.8 (L) x 101.6 (W) x 41.0 (see diagram for tolerance details)				mm
Weight	650 + 100 per output module				Grams
Note 1.	VCCM input modules can only be used with VCCM output modules and must not be used for any other purpose.				
Note 2.	Only use a power source of the type indicated on the product label.				

OUTPUT MODULE SPECIFICATION SUMMARY										
MODEL	Output Voltage			Output Current	Rated Power	Peak Power	Load Reg.	Line Reg.	Cross Reg.	Ripple & Noise
	Min.	Nom.	Max.							
OPA	1.5V	**5V**	7.5V	25A	125W	187.5W	±50mV	±5mV	±10mV	$50mV_{PP}$
OPB	4.5V	**12V**	15V	15A	150W	225W	±100mV	±12mV	±24mV	$120mV_{PP}$
OPC	9V	**24V**	30V	7.5A	150W	225W	±150mV	±24mV	±48mV	$240mV_{PP}$
OPD	18V	**48V**	58V	3.75A	150W	217.5W	±300mV	±48mV	±96mV	$480mV_{PP}$
Note 1.	VCCM output modules can only be used with VCCM series input modules and must not be used for any other purpose.									
Note 2.	VCCM output modules must be used within their ratings at all times. Please review product datasheet and user manual for further information.									

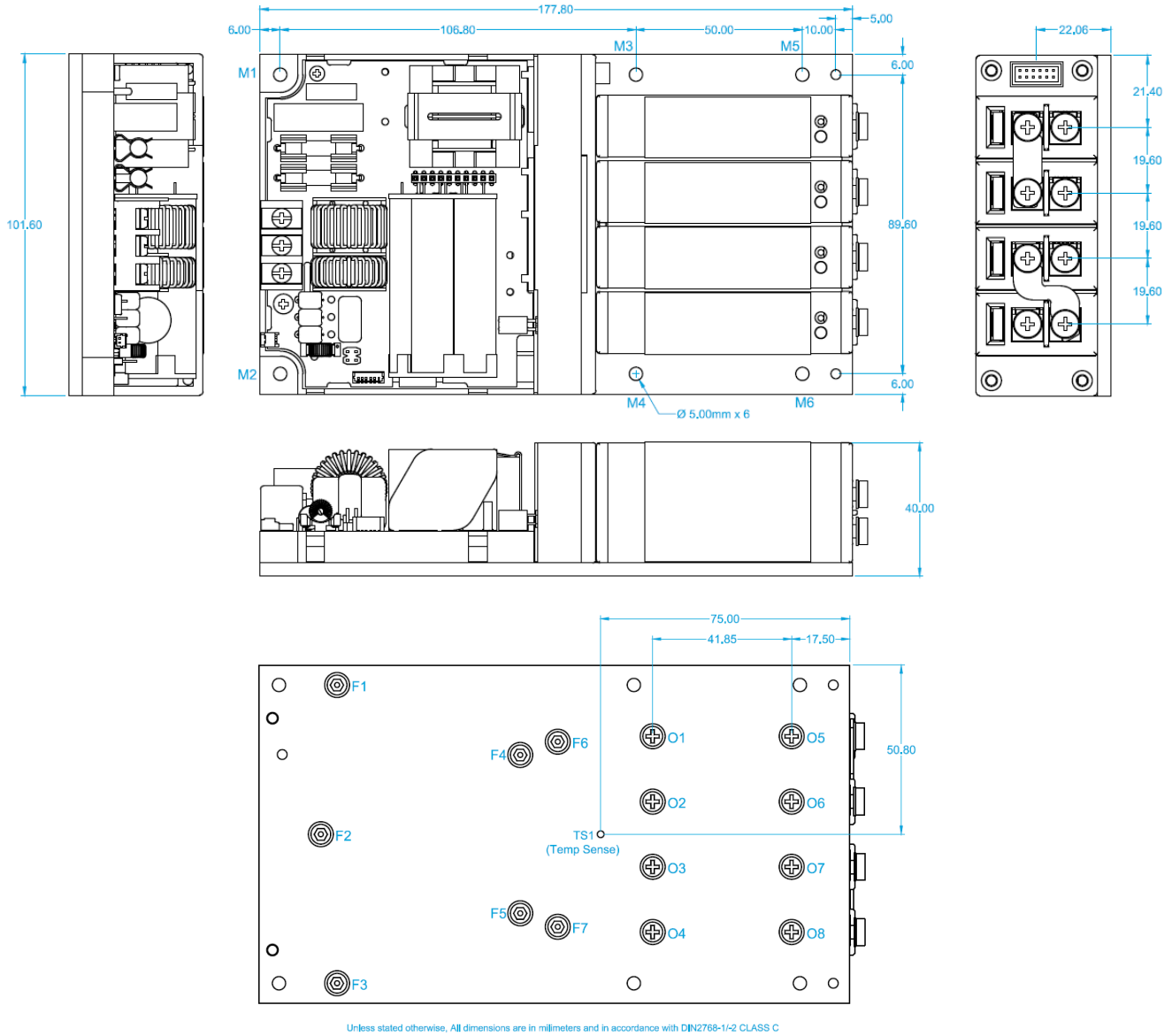
SAFETY SPECIFICATIONS				
Parameter	Details	Max	Units	Notes
Isolation Voltages	Input to Output (2 MOPP)	4000	V_{AC}	
	Input to J2 standby control (2 MOPP)	4000	V_{AC}	
	Input to Chassis (1 MOPP)	1500	V_{AC}	
	Global signals (J3) to Output/Chassis	500	V_{DC}	
	Output to Output/Chassis (Standard modules)	500	V_{DC}	
Earth Leakage Current	INDUSTRIAL: Normal condition, 264Vac, 63Hz, 25°C	1500	uA	
	MEDICAL: Normal condition, 264Vac, 63Hz, 25°C	200	uA	
Touch Leakage Current	Standard modules NC/SFC	20/200	uA	
Patient Leakage Current	Standard modules 264Vac, 63Hz, 25°C NC/SFC	-----	uA	Not applicable

INSTALLATION SPECIFICATIONS			
Parameter	Details	Parameter	Details
Equipment class	I	Flammability Rating	94V-2
Overvoltage category	II	Ingress protection rating	IP10
Material Group	IIIb (indoor use only)	ROHS compliance	2011/65/EU
Pollution degree	2	Intended usage environment	Home Healthcare (M)/ Industrial (S)

ENVIRONMENTAL SPECIFICATIONS						
Parameter	Details	Non-Operational		Operational		Units
		Min	Max	Min	Max	
Air Temperature	Operational limits subject to appropriate de-ratings	-51	+85	-40[1]	70	°C
Humidity	Relative, non-condensing	5	95	5	95	%
Altitude		-200	5000	-200	3000	m
Shock	EN 60068-2-27: Half sine, 3 axes, 3 positive & 3 negative. 810G: Method 516.6, Procedure IV, Transit drop		50, 11		30,18	g, mS
Vibration	EN 60068-2-6: Sine,10 – 500 Hz, 3 axes, 1 oct/min., 10 cycles each axis EN 60068-2-64: Random, 5 – 500 Hz, 3 axes, 30 min. 810G: Method 514.6, Procedure I (General Vibration) Category 4 (Trucks & Trailers, Composite wheeled vehicle), Figure 514.6C-3. Category 7 (Aircraft, Jet cargo), Figure 514.6C-5 General exposure Category 24, (All, Minimum integrity) Figure 514.6E-1		0.02,2.56		2 0.0122,1	g g^2/Hz, g_{RMS}
Thermal shock	MIL-STD-810G Method 503.5 Procedure I-C. Multi-cycle. 3 shocks.	-51	85			°C
Notes	1. Some specifications may not be met below -20°C.					

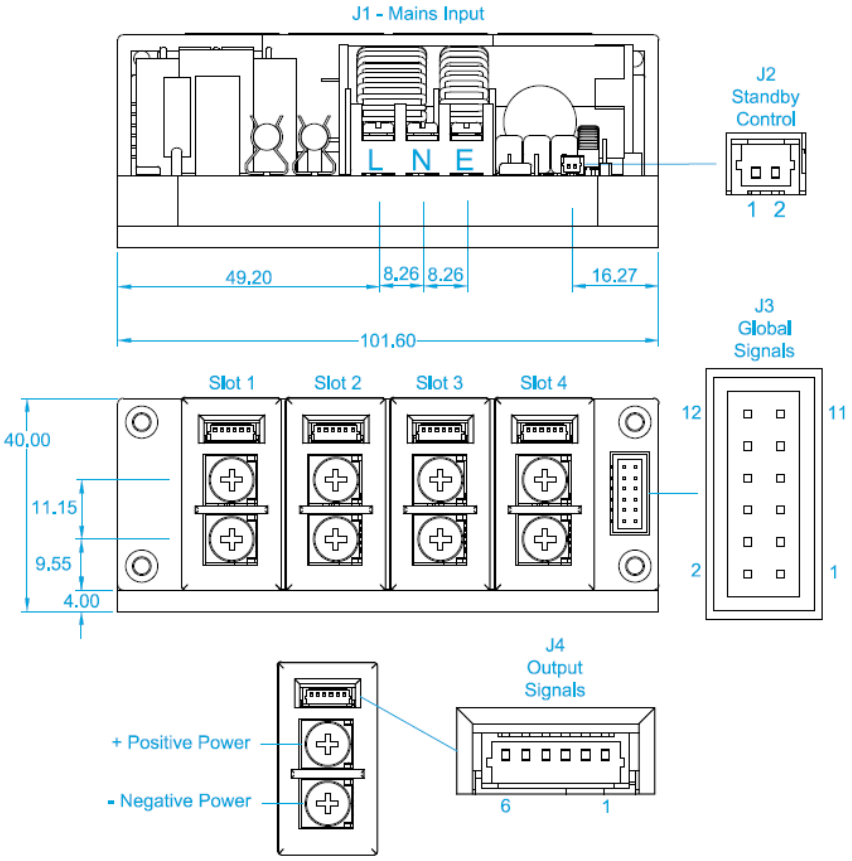
Mechanical Dimensions and Mounting

SCREWS			
Location	Details	Penetration	Tightening
Baseplate Mount: M1 – M6	Hole size, Diameter 5.00mm	4mm Baseplate thickness	0.55NM
Output Module Mount: O1 – O8	M3 CSK	M3 CSK screw, 8mm max length	0.5NM
Input module Mount: F1 – F5	Do not remove or adjust	Do not remove or adjust	Do not remove or adjust
Transformer module Mount: F6 – F7	M3 CSK	M3 CSK screw, 6mm max length	0.5NM
Output Module Terminal	M4 SEM	M4 SEM screw, 8mm max length	0.55NM



Connector details

PINOUTS	
Circuit	Details
J1 – Mains Input	
1	Live
2	Neutral
3	Earth
J2 – Standby control	
1	Standby control negative
2	Standby control positive
J3 – Global Signals	
1	Slot 4 - Power Good
2	Slot 4 - Inhibit
3	Slot 3 - Power Good
4	Slot 3 - Inhibit
5	Slot 2 - Power Good
6	Slot 2 - Inhibit
7	Slot 1 - Power Good
8	Slot 1 - Inhibit
9	Temperature sense (T_{SNS})
10	AC OK
11	+5V (Bias Supply 1A)
12	COM
J4 -Output Signals	
1	- Sense
2	+ Sense
3	COM
4	I Control
5	V Control
6	+5V (Bias Supply 10mA)

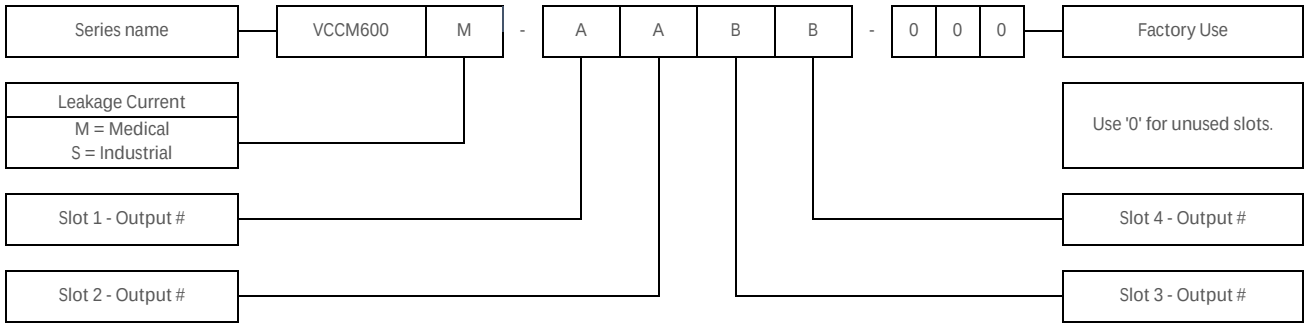


Unless stated otherwise, all dimensions are in millimetres and in accordance with DIN2768-1/2 CLASS C

MATING CONNECTORS				
Ref.	Details	Manufacturer	Housing	Terminal
J1 - Mains Input	3 Pin, Barrier, 6-32 Steel Screws, 0.8 Nm or 7 Lb-In Torque [1]			
J2 - Standby control	2 Pin, 1.25mm, with Friction Lock, 28-30AWG	MOLEX	0510210200	0500588000
J3 - Global Signals	12 Pin, 2mm, with Friction Lock, 24-30 AWG, WIRE TO BOARD	MOLEX	0511101260	0503948051
	12 Pin, 2mm, with Friction Lock, 24-30 AWG, IDT CABLE TO BOARD	MOLEX	0875681273	
J4 - Output Signals	6 PIN, 1.25mm, with Friction Lock, 28-30AWG	MOLEX	0510210600	0500588000
Output Power	Positive/Negative, M4 terminal, 0.55Nm, use appropriately rated crimp terminal			

Notes
1. Cable 14-18AWG, 300V, 16A, 105°C, use appropriately rated crimp terminal.
2. Direct equivalents may be used for any connector parts.
3. All cables must be rated 105°C min, equivalent to UL1015

PART NUMBERS AND ORDERING INFORMATION



Industrial input module has ITE approvals (IEC62368 & IEC60950), Medical input module has medical approvals (IEC60601)
Contact your Distributor or Vox Power for special configuration requirements. The factory may allocate a 3 digit suffix to identify such requirements.