



User's Manual



IEC62368-1
IEC61558-1/2-16
IEC61010-1/2-201
IEC60601-1
IEC60335-1
IEC62477-1

BS EN/EN62368-1
BS EN/EN61558-1/2-16
BS EN/EN61010-1/2-201
BS EN/EN60601-1
BS EN/EN60335-1
BS EN/EN62477-1

UL62368-1
ANSI/AAMI ES60601-1

LISTED
UL61010-1



AS/NZS61558-1/2-16 GB4943.1 CNS15598-1 KC62368-1 (By request) TPTC004
AS/NZS62368-1

Features

- 85~305Vac input with PFC(277Vac available)
- No load power consumption<0.75W by R.C.
- Global certificates in multi-fields
(ITE 62368-1, Medical 60601-1, Household 60335-1, Industrial 61558-1/2-16/61010-1, Energy converter 62477-1)
- 200% peak power capability(12~60V models)
- High efficiency up to 95%
- -40~+85°C wide range operation temperature(> +60°C derating)
- Extremely low leakage current<350μA, 2 x MOPP, suitable for BF medical applications
- Built-in constant current limiting circuit
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Forced air cooling by built-in DC fan with noise <45dB and fan ON/OFF control
- Built-in Remote ON/OFF control/Remote Sense/ DC OK signal
- Over voltage category III (OVC III)
- Operating altitude up to 5000 meters
- Conformal coating
- 5 years warranty

Description

The NSP-500 series is a 500W AC/DC power supply with PFC function, designed for high reliability and suitable for multiple industries. Key features include: compact size (199*99*41 mm) for better space utilization in system installations, ultra-wide input range of 85~305Vac for global compatibility, up to 95%efficiency and low standby power consumption (<0.75W)for energy-saving and carbon reduction, constant current design with 200% peak power capability,wide operating temperature range from -40 to +85°C (+60°C at full load), compliance with OVCIII, built-in Remote Control /Remote Sense/DC OK signal, internal PCB coating, complete protections, certifications for multiple safety standards including 62368-1, 60601-1, 61558-1, 60335-1, 62477-1, and 61010-1, as well as 2 X MOPP compliance and extremely low leakage current (<350μA).It is suitable for BF-rated medical equipment and comes with a 5-years warranty, making it a highly cost-effective solution for industrial power supply needs.

Model Encoding

NSP - 500- 24

- Output voltage (5V/12V/15V/24V/27V/36V/48V/60V)
- Output wattage
- Series name



Applications

- Industrial automation machinery/ control system
- Security system
- Mechanical and electrical equipment
- Electronic instruments, equipments or apparatus
- Network equipment
- Telecom devices
- Power sourcing equipment of PoE
- Home automation
- Medical devices
- Charging application

GTIN CODE

MW Search: <https://www.meanwell.com/serviceGTIN.aspx>



500W AC/DC High Reliable Multi-Industries Enclosed Type Power Supply **NSP-500** series

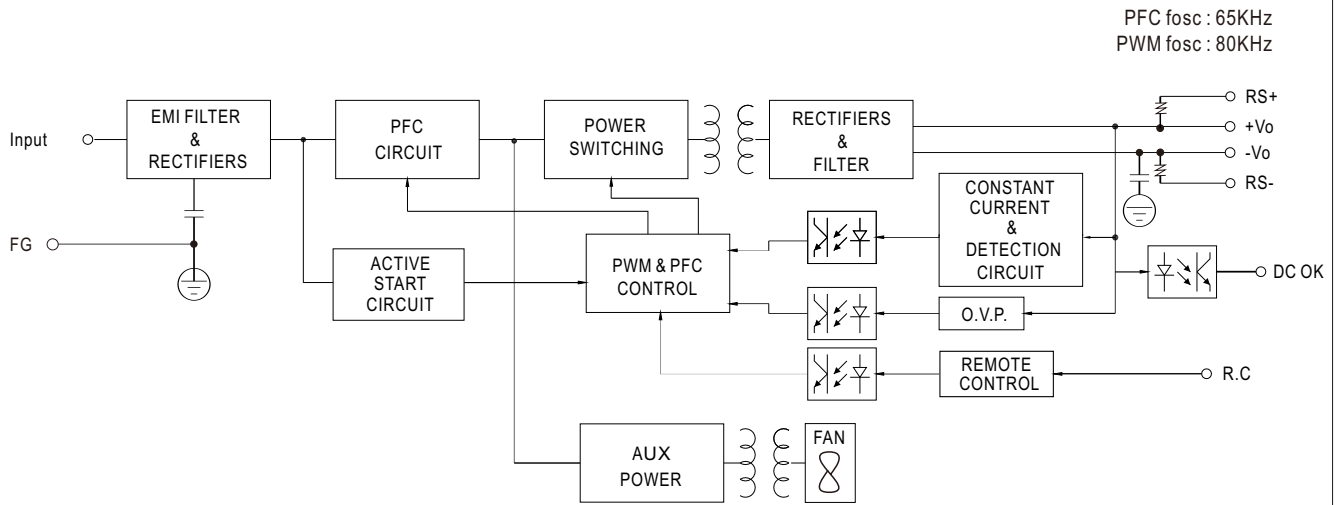
SPECIFICATION		NSP-500-5	NSP-500-12	NSP-500-15	NSP-500-24	NSP-500-27	NSP-500-36	NSP-500-48	NSP-500-60	
OUTPUT										
DC VOLTAGE		5V	12V	15V	24V	27V	36V	48V	60V	
RATED CURRENT		90A	42A	33.4A	21A	18.6A	13.9A	10.5A	8.4A	
CURRENT RANGE		0 ~ 90A	0 ~ 42A	0 ~ 33.4A	0 ~ 21A	0 ~ 18.6A	0 ~ 13.9A	0 ~ 10.5A	0 ~ 8.4A	
RATED POWER		450W	504W	501W	504W	502.2W	500.4W	504W	504W	
PEEK	CURRENT(5 sec.)	N/A	84A	66.7A	41.7A	37A	27.8A	20.8A	16.7A	
	POWER(5 sec.)	N/A	1000W	1000W	1000W	1000W	1000W	1000W	1000W	
RIPPLE & NOISE (max.)		Note.2	200mVp-p	200mVp-p	200mVp-p	240mVp-p	240mVp-p	240mVp-p	300mVp-p	
VOLTAGE ADJ. RANGE			4.7 ~ 5.5V	10.8 ~ 14V	15 ~ 19V	21 ~ 26V	26 ~ 32V	32 ~ 43V	44 ~ 57V	54 ~ 72V
VOLTAGE TOLERANCE		Note.3	±2.0%	±2.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	
LINE REGULATION			±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	
LOAD REGULATION			±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	
SETUP, RISE TIME			1500ms, 80ms/115Vac		1000ms, 80ms/230Vac		900ms, 80ms/277Vac			
HOLD UP TIME (Typ.)			16ms at full load							
INPUT										
VOLTAGE RANGE		Note.4	85 ~ 305Vac		120 ~ 431Vdc					
NO LOAD POWER CONSUMPTION(Typ.)	Remote Power OFF		0.75W/115Vac	0.75W/230Vac	0.75W/277Vac					
	Remote Power ON		3.3W/115Vac	3W/230Vac	3W/277Vac					
FREQUENCY RANGE			47 ~ 63Hz							
POWER FACTOR (Typ.)			PF>0.98/115Vac, PF>0.93/230Vac, PF>0.9/277Vac at full load							
EFFICIENCY (Typ.)			90%	92%	92%	94%	94%	94.5%	95%	95%
AC CURRENT (Typ.)			5.3A/115Vac	2.6A/230Vac	2.2A/277Vac					
INRUSH CURRENT (Typ.)			COLD START 20A/115Vac 40A/230Vac 50A/277Vac							
LEAKAGE CURRENT			Earth leakage current <350μA(rms)@277Vac, touch current<100μA(rms) @ 277Vac							
PROTECTION										
SHORT CIRCUIT	5V		Constant current limiting for more than 5 seconds (Vout<30%) and then hiccup mode, recovers automatically after fault condition is removed							
	12V ~ 60V		Constant current limiting for more than 5 seconds (Vout<30%) and then shut down o/p voltage, AC re-power on to recover or Hiccup mode, recovery automatically after fault condition is removed. Depends on the user's wire impedance							
OVERLOAD	5V		105%~150% rated output power; More than 5 seconds and then hiccup mode,recovers automatically after fault condition is removed							
	12V ~ 60V		Normally works within 105 ~ 200% rated output power for more than 5 seconds and then constant current limiting without shutdown(Vout>30%), recovers automatically after fault condition is removed, or shut down o/p voltage when Vout<30%,AC re-power on to recover >200% rated power, constant current limiting (Vout>30%)with auto-recovery after fault condition is removed, or shut down o/p voltage when Vout<30%,AC re-power on to recover							
OVER VOLTAGE			5.8 ~ 7.5V	15 ~ 19V	20 ~ 25V	28 ~ 36V	33~ 42V	44 ~ 54V	58~ 70V	73~ 86V
			Protection type : Shut down o/p voltage, AC re-power on to recover							
OVER TEMPERATURE			Shut down o/p voltage, AC re-power on to recover							
FUNCTION										
REMOTE CONTROL			POWER ON: RC+~RC- 0~0.8Vdc or open , POWER OFF: RC+~RC- 3.3~10Vdc by eternal voltage							
REMOTE SENSE			Compensate voltage drop on the load wiring up to 0.3V. Please refer to the Function Manual							
DC OK SIGNAL			By phototransistor contact rating(max.):15Vdc/10mA resistive load. Please refer to the Function Manual.							
FAN NOISE(Typ.)			Fan ON/OFF control, RTH4≥50℃ ±10℃ FAN ON; RTH4≤40℃ ±10℃ FAN OFF							
			45dB							
ENVIRONMENT										
WORKING TEMP.			-40 ~ +85℃ (Refer to "Derating Curve")							
WORKING HUMIDITY			20 ~ 90% RH non-condensing							
STORAGE TEMP., HUMIDITY			-40 ~ +85℃, 10 ~ 95% RH non-condensing							
TEMP. COEFFICIENT			±0.05%/℃ (0 ~ 60℃)							
VIBRATION			10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes							



500W AC/DC High Reliable Multi-Industries Enclosed Type Power Supply **NSP-500** series

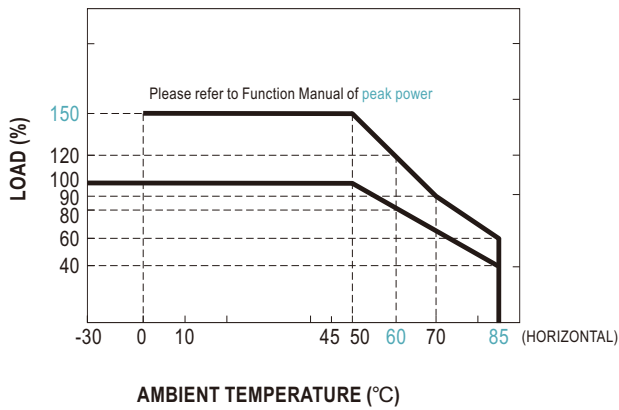
SPECIFICATION		NSP-500-5	NSP-500-12	NSP-500-15	NSP-500-24	NSP-500-27	NSP-500-36	NSP-500-48	NSP-500-60
SAFETY & EMC		Note 6&7							
SAFETY STANDARDS	CB	IEC62368-1, IEC60335-1, IEC61558-1/-2-16, IEC61010-1/-2-201, IEC60601-1; IEC62477-1							
	DEKRA	BS EN/EN62368-1, BS EN/EN60335-1, BS EN/EN61558-1/-2-16, BS EN/EN61010-1/-2-201, BS EN/EN60601-1(3.2 Version);BS EN/EN62477-1							
	UL	UL62368-1, ANSI/AAMI ES60601-1(3.2 Version),UL61010-1/-2-201							
	RCM	AS/NZS 62368-1, AS/NZS 61558-1/-2-16							
	CCC	GB4943.1							
	BSMI	CNS15598-1							
	EAC	TP TC 004 approved;							
	KC/BIS	KC62368-1 and BIS IS 13252(Part 1) :2010 certified, no stock by request, contact sale for inquiries							
ISOLATION LEVEL	Note 8	Primary-Secondary: 2xMOPP, Primary-Earth: 1xMOPP, Secondary-Earth: 1xMOPP							
OVER VOLTAGE CATEGORY	IEC/EN 61558-1/-2-16	(OVC III, altitude up to 2000M)							
	IEC/EN/UL 62368-1	(OVC II, altitude up to 5000M)							
	IEC/EN 60335-1	(OVC II, altitude up to 5000M)							
	IEC/EN 60601-1	(OVC II, altitude up to 4000M)							
	IEC/EN 61010-1/-2-201	(OVC II, altitude up to 5000M)							
	IEC/EN 62477-1	(OVC II, altitude up to 5000M)							
SAFETY EXTRA-LOW VOLTAGE(SELV)		IEC/EN 61558-2-16 (SELV, 5 ~ 36V) IEC/EN 60335-1 (SELV, 5 ~ 36V) IEC/EN/UL 62368-1 (SELV/ES1, 5 ~ 36V)							
WITHSTAND VOLTAGE		I/P-O/P:4.2KVac I/P-FG:2.1KVac O/P-FG:1.5KVac							
ISOLATION RESISTANCE		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃ / 70% RH							
EMC EMISSION	Parameter	Standard				Test Level / Note			
	Conducted	BS EN/EN55032(CISPR32),CNS 15936				Class B			
		BS EN/EN55014-1(CISPR14-1)							
		BS EN/EN55011(CISPR11)				Class B			
	Radiated	BS EN/EN55032(CISPR32),CNS 15936				Class B			
		BS EN/EN55014-1(CISPR14-1)							
		BS EN/EN55011(CISPR11)				Class B			
	Harmonic Current	BS EN/EN61000-3-2(IEC61000-3-2)				Class A			
	Voltage Flicker	BS EN/EN61000-3-3(IEC61000-3-3)				-----			
	BS EN/EN55035(CISPR35),BS EN/EN61000-6-2(IEC61000-6-2),BS EN/EN60601-1-2(IEC60601-1-2), BS EN/EN55014-2(CISPR14-2)								
EMC IMMUNITY	Parameter	Standard				Test Level / Note			
	ESD	BS EN/EN61000-4-2				Level 4, 15KV air ; Level 4, 8KV contact			
	Radiated	BS EN/EN61000-4-3				Level 3, 10V/m(80MHz~2.7GHz) Table 9, 9~28V/m(385MHz~5.78GHz)			
	EFT / Burst	BS EN/EN61000-4-4				Level 3, 2KV			
	Surge	BS EN/EN61000-4-5				Level 4, 2KV/Line-Line 4KV/Line-Earth			
	Conducted	BS EN/EN61000-4-6				Level 3, 10V			
	Magnetic Field	BS EN/EN61000-4-8				Level 4, 30A/m			
	Voltage Dips and Interruptions	BS EN/EN61000-4-11				>95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods			
OTHERS									
MTBF	1213.4 K hrs min. Telcordia SR-332 (Bellcore) ; 212.1K hrs min. MIL-HDBK-217F (25℃)								
DIMENSION (L*W*H)	199*99*41mm								
PACKING	1Kg;12pcs/13Kg/0.72 CUFT								
NOTE									
1. All parameters NOT specially mentioned are measured at 230Vac input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor. 3. Tolerance: includes set up tolerance, line regulation and load regulation. 4. Derating may be need under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details. 5. The ambient temperature derating of 3.5℃/1000m with fanless models and 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).. 6. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf) 7. RCM is on voluntary basis and meets relevant IEC or AS/NZS standards complying with AS/NZS 4417.1. 8. MOPP is suitable for 100-240Vac input only. ※ Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx									

■ Block Diagram

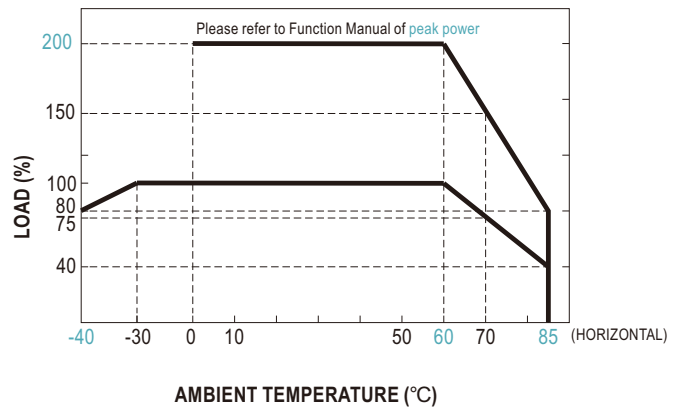


■ Derating Curve

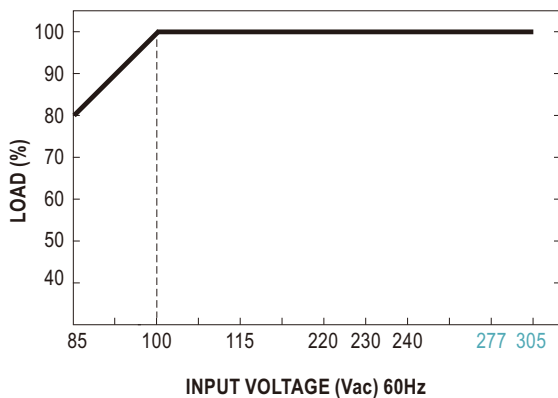
Suitable for 100/110/115/120Vac System
(85~135Vac)



Suitable for 220/230/240/277Vac System
(180~305Vac)



■ Output Derating vs Input Voltage



■ Function Manual

1. Peak Power

$$P_{av} = \frac{P_{pk} \times t + P_{npk} \times (T-t)}{T} \leq P_{rated}$$

$$\text{Duty} = \frac{t}{T} \times 100\% \leq 35\%$$

$$t \leq 5 \text{ sec}$$

P_{av} : Average output power (W)

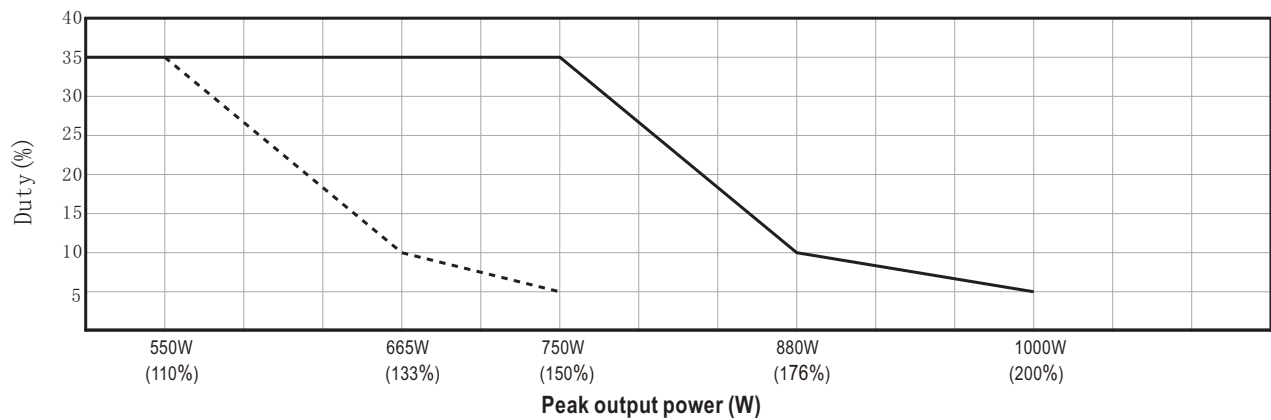
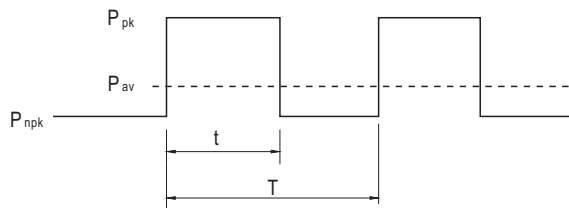
P_{pk} : Peak output power (W)

P_{npk} : Non-peak output power (W)

P_{rated} : Rated output power (W)

t : Peak power width (sec)

T : Period (sec)



For example (24V model) :

$V_{in} = 200\text{Vac}$ $\text{Duty}_{\text{max}} = 5\%$

$P_{av} = P_{rated} = 500\text{W}$

$P_{pk} = 1000\text{W}$

$t \leq 5 \text{ sec}$

$$T \geq \frac{5 \text{ sec}}{5\%} \geq 100\text{sec}$$

$$P_{npk} \leq \frac{T P_{av} - t P_{pk}}{T-t}$$

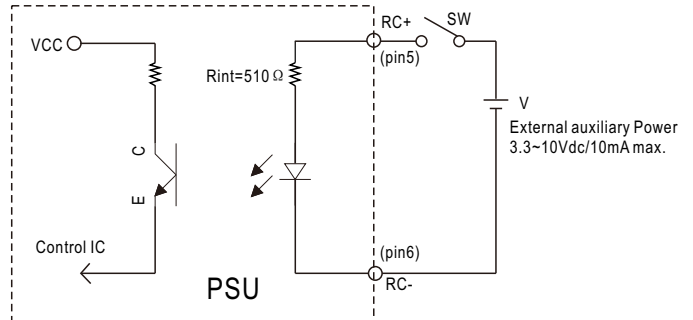
$$P_{npk} \leq 473\text{W}$$

Note: When the output voltage is adjusted to the upper limit, the peak power is 150% rated power.

2.Remote Control

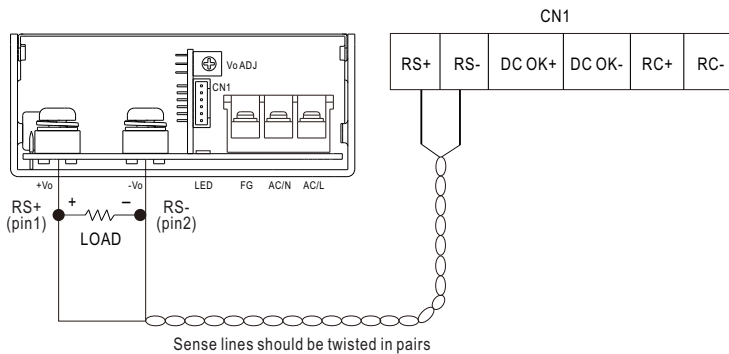
The PSU can be turned ON/OFF by using the "Remote Control" function with external switch and auxiliary power.

PSU Vo Status	Between RC-(pin6) and RC+(pin5) on CN1
POWER ON	Keep 0~0.8Vdc or open
POWER OFF	Keep 3.3~10Vdc by external voltage



3.Remote Sense

The remote sensing compensates voltage drop on the load wiring up to 0.3Vdc.

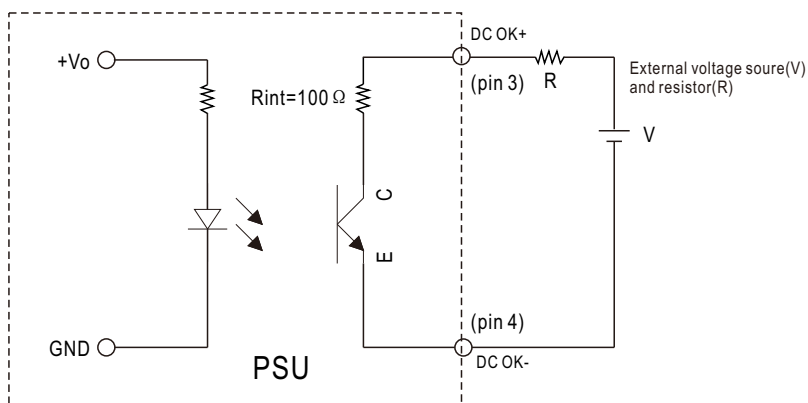


4.DC_OK signal

DC_OK is a collector shorted signal. It is used by an optocoupler in the power supply which indicates the output status of the power supply as exhibited below.

PSU Vo Status	Photo transistor
POWER ON	Conduct(Low impedance)
POWER OFF	Open(High impedance)

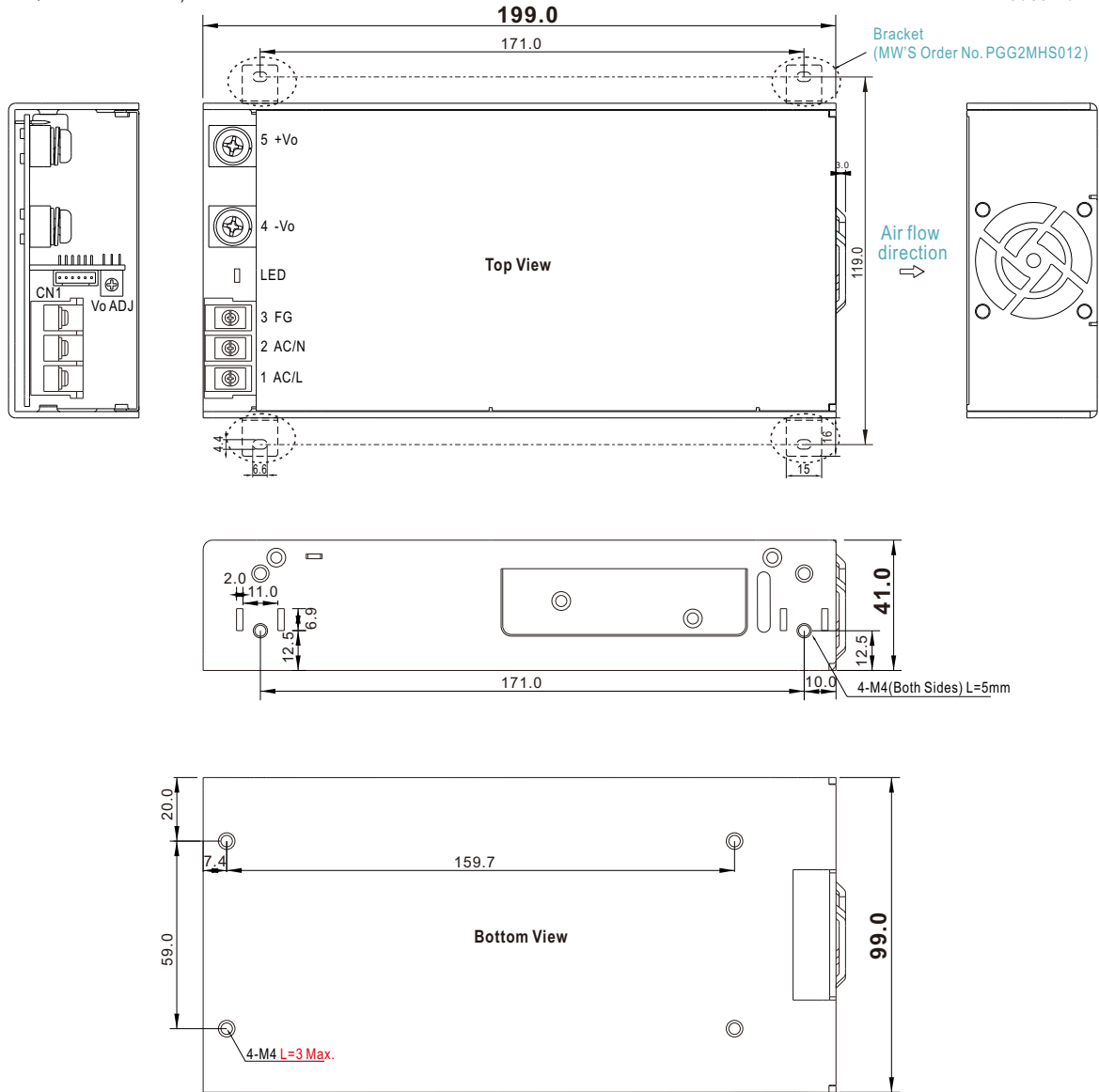
Optocoupler Rating(max.) 15Vdc/10mA resistive load



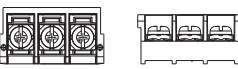
■ Mechanical Specification

(Unit: mm , tolerance ± 1 mm)

Case No.215B



※ AC Input Terminal Pin No. Assignment

Pin No.	Assignment	Diagram	Screw Size	Mounting torque
1	AC/N or DC input -Vin		M3.5	8~10Kgf-cm
2	AC/L or DC input +Vin			
3	FG $\perp$			

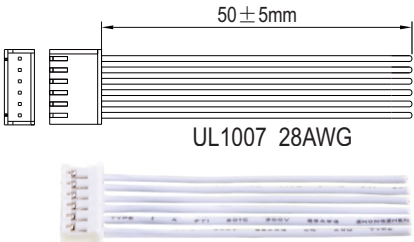
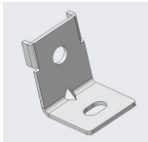
※ DC Output Terminal Pin No. Assignment

Pin No.	Assignment	Diagram	Screw Size	Mounting torque
5	+Vo	For 5~15V models 	M5	10~12Kgf-cm
4	-Vo	For 24~60V models 	M4	

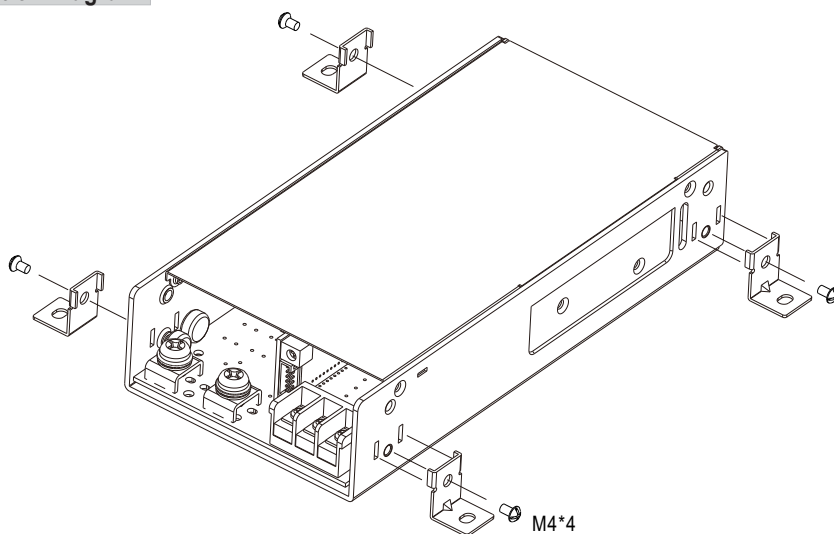
※ Connector Pin No. Assignment (CN1): DJS-1125R-06 or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	RS+	JS-11242-06 or equivalent	DJS-1125R-06 or equivalent
2	RS-		
3	DC OK+		
4	DC OK-		
5	RC+		
6	RC-		

■ Accessory List

No.	Item	Quantity
1	Control function interface(CN1) mating wire along with NSP-500 (standard accessory) 	1pcs/per model
2	Bracket MW'S Order NO. : PGG2MHS012 (By request accessory,should ordered seperately) 	4pcs/per model (Please refer to Installation Diagram)
3	Terminal cover MW'S Order NO. : PEE4TBC-03 (By request accessory,should ordered seperately) 	1pcs/per model

■ Installation Diagram



■ Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>