



SPECIFICATION

For

SWITCHING POWER SUPPLY

M/N: MPI-U400 series

Revisions History

REV.	June 25 th , 2009	1) Efficiency change to “above 91%” 2) Remove Leakage current
REV.	Apr. 7 th , 2010	Adding performance curves.
REV.	Apr. 8 th , 2010	1) Efficiency change to “up to 95%” 2) Efficiency add “95%” at max. 3) Deleted min. load requirement.
REV.	Apr. 15 th , 2010	Updating descriptions of hold up time & efficiency.
REV.	Jun. 25 th , 2010	Updating performance curves.
REV.	Aug. 25 th , 2010	Adding condition in description of hold-up time & efficiency.
REV.	Sep. 7 th , 2010	1) Updating the criteria of IEC61000-4-11. 2) Adding pin assignment of DC fan output connector.
REV.	Oct. 1 st 2010	Correcting description note of load regulation.
REV.	Oct. 20 th 2010	Updating Safety approval status.
REV.	Nov. 4 th 2010	Updating spec of fixed screws.
REV.	Nov. 5 th 2010	Adding performance curves of 70°C with convection cooled. Updating operating temperature range.
REV.	Mar. 28 th 2011	Defining the fan output current is 0.5A max.
REV.	Feb. 17 th 2012	Updated the "Over Temperature Protection" function.
REV.	Apr. 26 th 2012	Updated the safety approvals status.
REV.	Jun. 13 th 2012	Updated derating curves.
REV.	Mar. 27 th 2017	Changed Operating Altitude form 2K to 3.5K



FEATURES

- 400W single output power supply
- Active PFC meets Class D
- Conducted EMI meets CISPR/FCC Class B
- High Efficiency up to 95%
- Adjustable output range
- Design to meet IEC 60950-1, EN 60950-1, and UL 60950-1
- Utilizes a thermally efficient U channel chassis design

1. Description

MPI-U400 series is a 400W single output switching power supply within compact size 198 x 97 x 41mm, and it is with active PFC for meeting IEC 61000-3-2 and IEC 61000-3-3. It utilizes a thermal efficient U channel chassis design.

Model Number	Output Voltage range ^(Note 1)	Min. Output Current	Rated Output Power	Total Regulation ^(Note 2)	Ripple & Noise p-p ^(Note 3)	Initial Setting Accuracy ^(Note 4)
MPI-U403	+11-13V / 12V	0A	400W	±2%	±1%	1%
MPI-U405	+22-26V / 24V	0A	400W	±2%	±1%	1%

Output Power: Total maximum power is rated 400W with convection cooled at 50 degree C ^(Note 5), with minimum 23.3CFM forced air cooling at 70°C, also can reach max. 320W with convection cooled at 70 degree C ^(Note 6) environment temperature.

- Note:
- 1) Output voltage can be adjusted by variable resistor with nominal 12/24V which would be adjusted at factory.
 - 2) Total regulation is measured a setting output voltage. Input voltage is from 90-264VAC and output from 0-400W.
 - 3) Measured by a 20MHz bandwidth limited oscilloscope and the each output is connected with a 10µF Electrolytic Capacitor and a 0.1µF Ceramic Capacitor.
 - 4) Voltage setting is at nominal AC input voltage 60% rated load and 25°C.
 - 5) If input voltage is lower than 230VAC, the output power should be considered. Please see the detail info at section 5 performance curves.
 - 6) Please see the detail info at section 5 performance curves for model MPI-U403. For model MPI-U405, max. 280W if the input voltage is higher than 115VAC, otherwise, max. 200W.

2. Input Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Input Voltage	Continuous input range	90	115/230	264	VAC
Input Frequency	AC input.	47	50/60	63	Hz
Hold Up Time	AC 230V input , 24 V _{OUT} for MPI-U405		20		ms
Inrush Current				60	A

NOTE: Nominal input 230VAC input and rated load would be referred to all testing conditions if no specific condition indicated.

3. Output Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Efficiency	AC 230V input, 24V _{OUT} , load 14.6A		94	95	%
Minimum load			See Chart of Description		
Ripple & Noise	Rated load, 20MHz bandwidth		See Chart of Description		
Total Regulation	On condition of a setting output voltage, input voltage from 90-264VAC and output from 0W to 400W.		See Chart of Description		

NOTE: Nominal input 230VAC input and rated load would be referred to all testing conditions if no specific condition indicated.



4. Interface Signals and Internal Protection

Parameter	Conditions/Description
Remote Voltage sense	Compensates for wire voltage drop.
Short Circuit Protection	Fully protected against output overload and short circuit. Automatic recovery upon of overload condition.
Over Voltage Protection	For some reason the power supply fails to control itself, the build-in over voltage protection circuit will shut down the outputs to prevent damaging external circuits.
Over Temperature Protection	When the power supply operating over the temperature or over load limit, the power supply will be shut down automatically to protect itself.

NOTE: Nominal input 230VAC input and rated load would be referred to all testing conditions if no specific condition indicated.

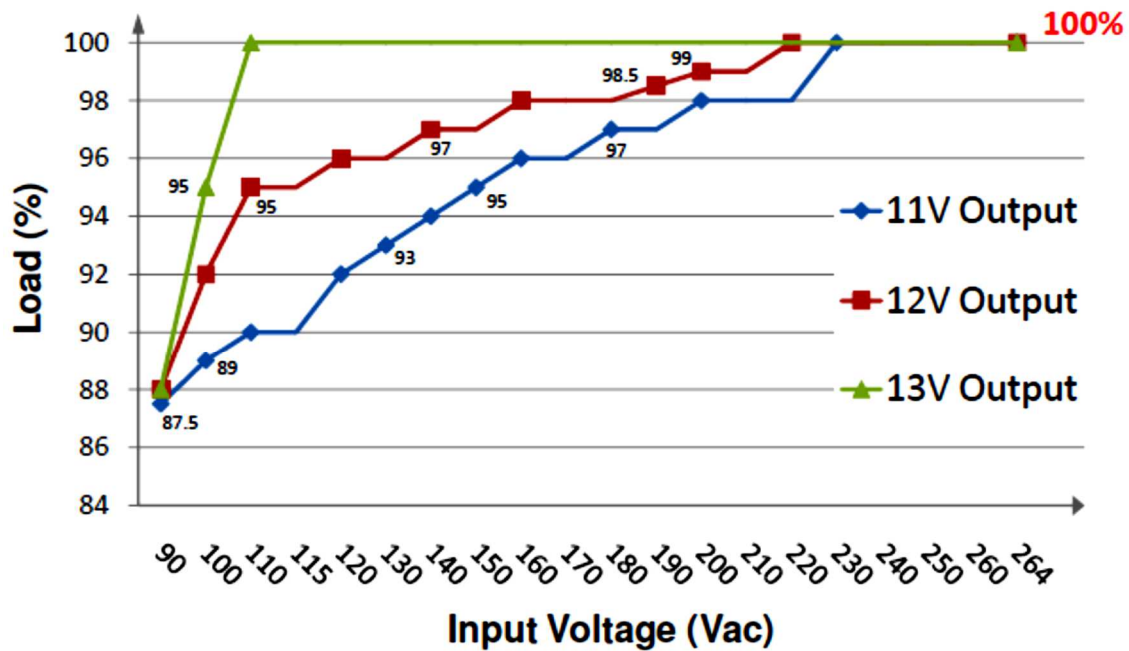
5. Environment Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units
Storage Temperature		-20		+85	°C
Relative Humidity	Non-condensing.	5		95	%RH
Altitude	Operating Non-operating			3.5K 4K	Meter
Operating Temperature	Performance curves are below.	* -40 (-25)		+70	°C

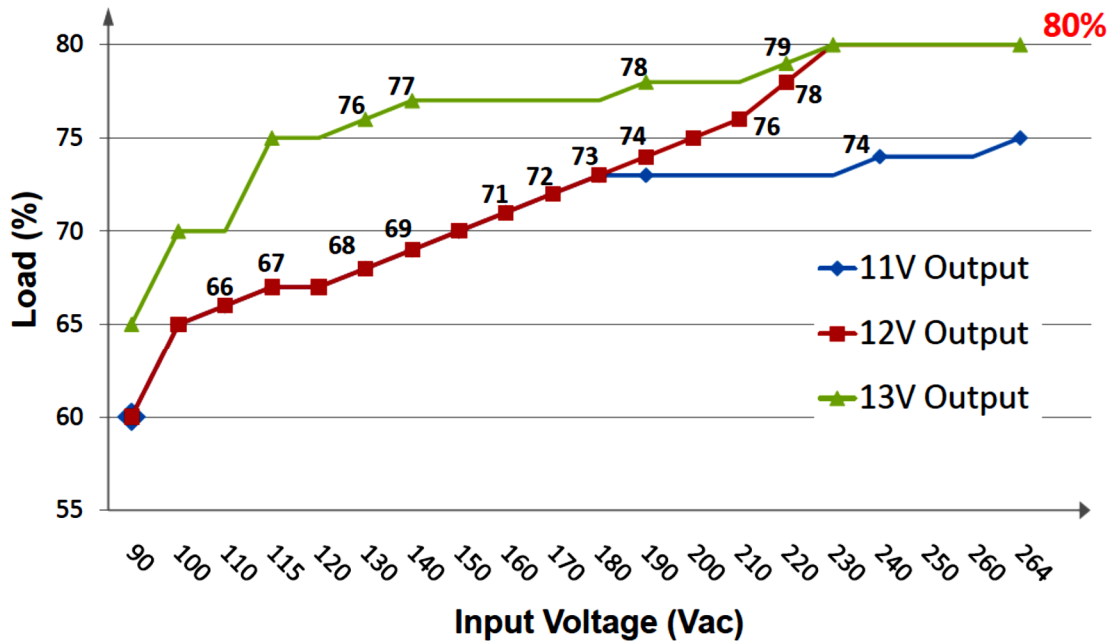
*: Can be start-up at -40°C.

Performance curves

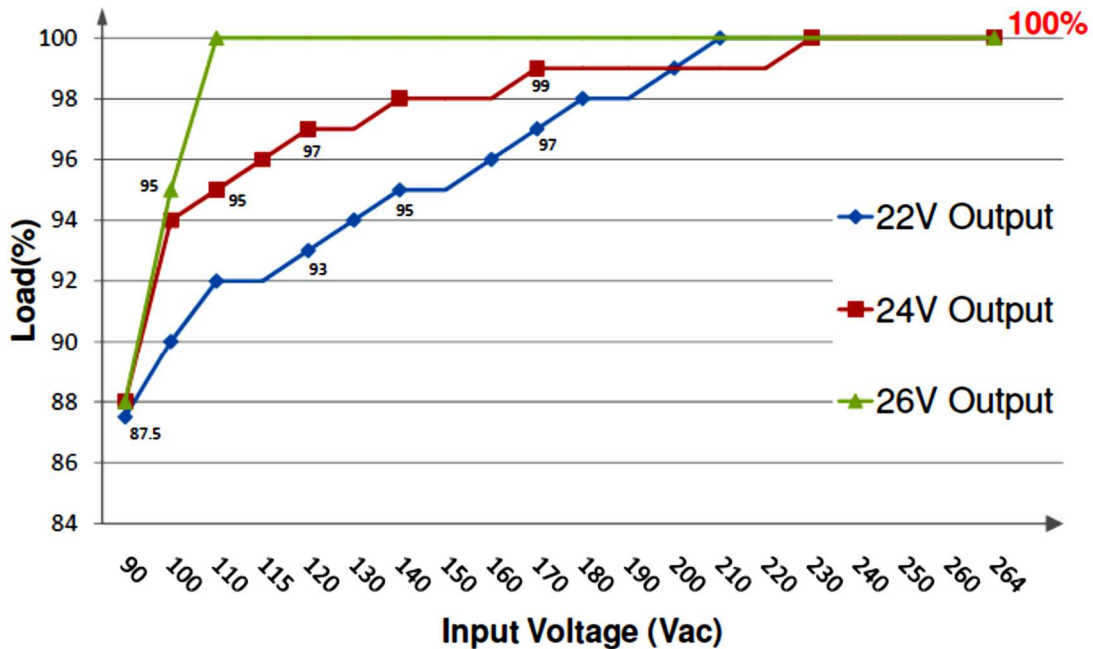
Open frame without cover:



MPI-U403 with Convection Cooled @ambient 50 degree C



MPI-U403 with Convection Cooled @ ambient 70 degree C



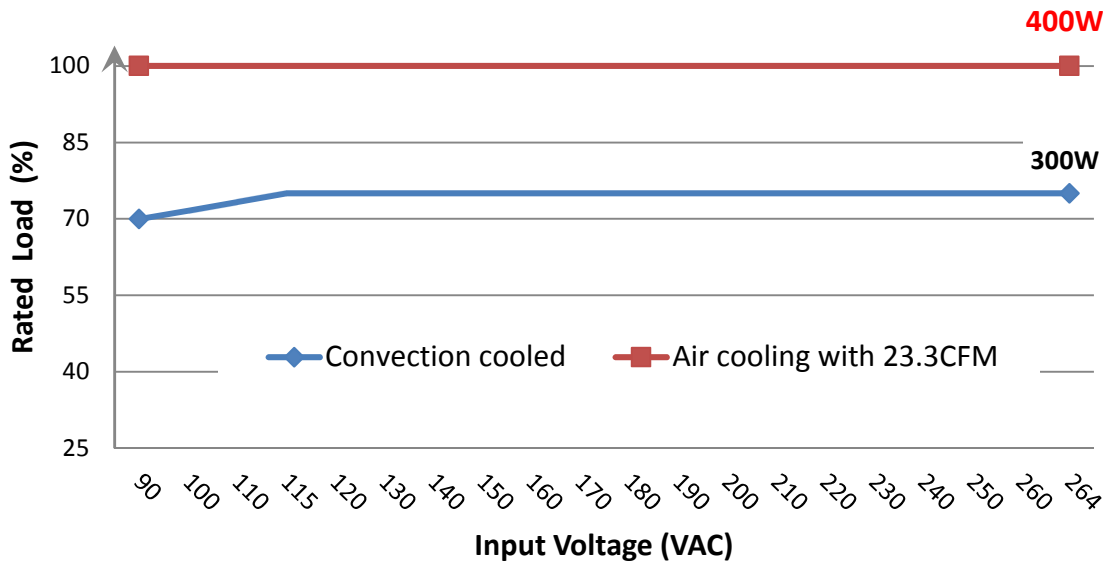
MPI-U405 with Convection Cooled @ ambient 50 degree C

(If the ambient above 50 degree C, please see note 1.)

Note: 1) When the input voltage is 115~264Vac, the output power is 280W max. at ambient from 51 to 70 degree C; If the input voltage is 90~114Vac, the output power is 200W max. at ambient from 51 to 70 degree C.

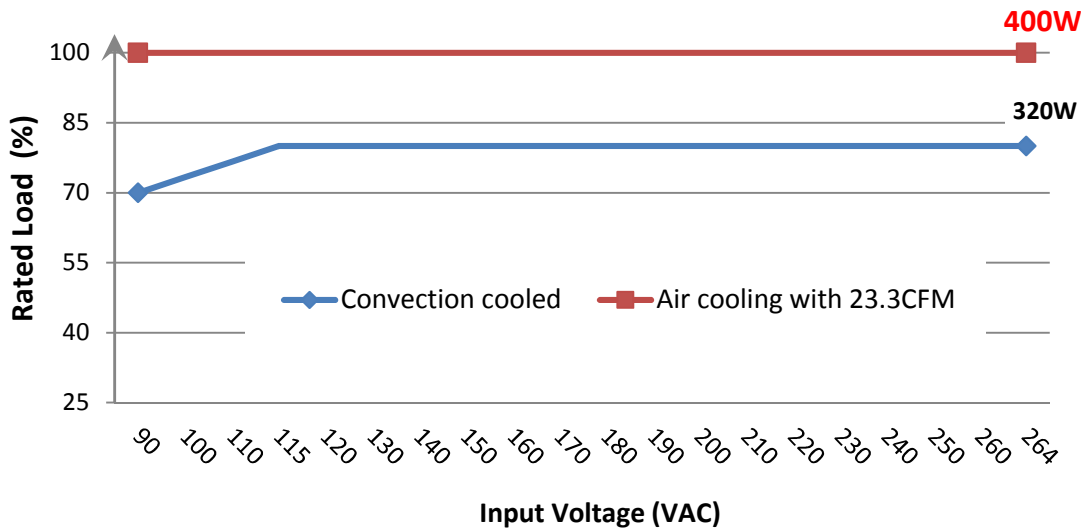


With optional cover:



Performance curves of MPI-U403-C (12V output @ 50°C)

(If the ambient above 50 degree C, please see note 1.)



Performance curves of MPI-U405-C (24V output @ 50°C)

(If the ambient above 50 degree C, please see note 1.)

Note: 1) In condition of the unit with optional cover (model no. suffix -C), the max. output is 200W with convection cooled, max. 350W with 23.3CFM forced air cooling at ambient from 51 to 70 degree C.



6. Safety Approvals, EMI and EMS Specification

Parameter	Conditions/Description	Min.	Nom.	Max.	Units	
Approvals	IEC 60950-1, 2nd edition				CB approved	
	EN 60950-1, 2nd edition				CE Declaration	
	UL 60950-1, 2nd Edition				UL approved	
	CSA C22.2 No. 60950-1-07, 2nd Edition				cUL approved	
EMI	EN 55022	B			Class	
	EN 61204-3	B				
PFC	EN 61000-3-2: 2000 & EN 610003-3: 2001	D				
EMS	IEC 61000-4-2: 2001, 8KV air discharge, 6KV contact discharge	A			Criteria	
	IEC 61000-4-3: 2002, 10V/m	A				
	IEC 61000-4-4: 2004, 2KV line & PE	A				
	IEC 61000-4-5: 2001, 1KV line to line, 2KV line to PE	A				
	IEC 61000-4-6: 2004, 10V/m	A				
	IEC 61000-4-8: 2001, 3A/m	A				
	IEC 61000-4-11: 2004,	Voltage dips >95%, 0.5 cycle	A			
		Voltage dips >30%, 25 cycles	A			
		Voltage dips >60%, 5 cycles	A			
	Voltage interruptions >95%, 250 cycles	B				

7. Mechanical

Parameter	Conditions/Description
Dimension	198 (L) x 97 (W) mm, tolerance +/- 0.4mm, With (H) 41 mm, tolerance +0/-0.5 mm.
Connector	CN1 --- AC input: 3 Positions Terminal Blocks, European type by request.
	CN2 --- DC output: 4 Positions Terminal Blocks, European type by request.
	CN3 --- Output remote sense: 2 Positions
	FAN --- DC Fan output: 2 Positions
Pin Assignment	CN1 Pin 1. L 2. N 3. GND
	CN2 Pin 1. V+ 2. V+ 3. V- 4. V-
	CN3 Pin 1. Remote Sense + 2. Remote Sense -
	FAN ^(Note 1) Pin 1. V+ 2. V-

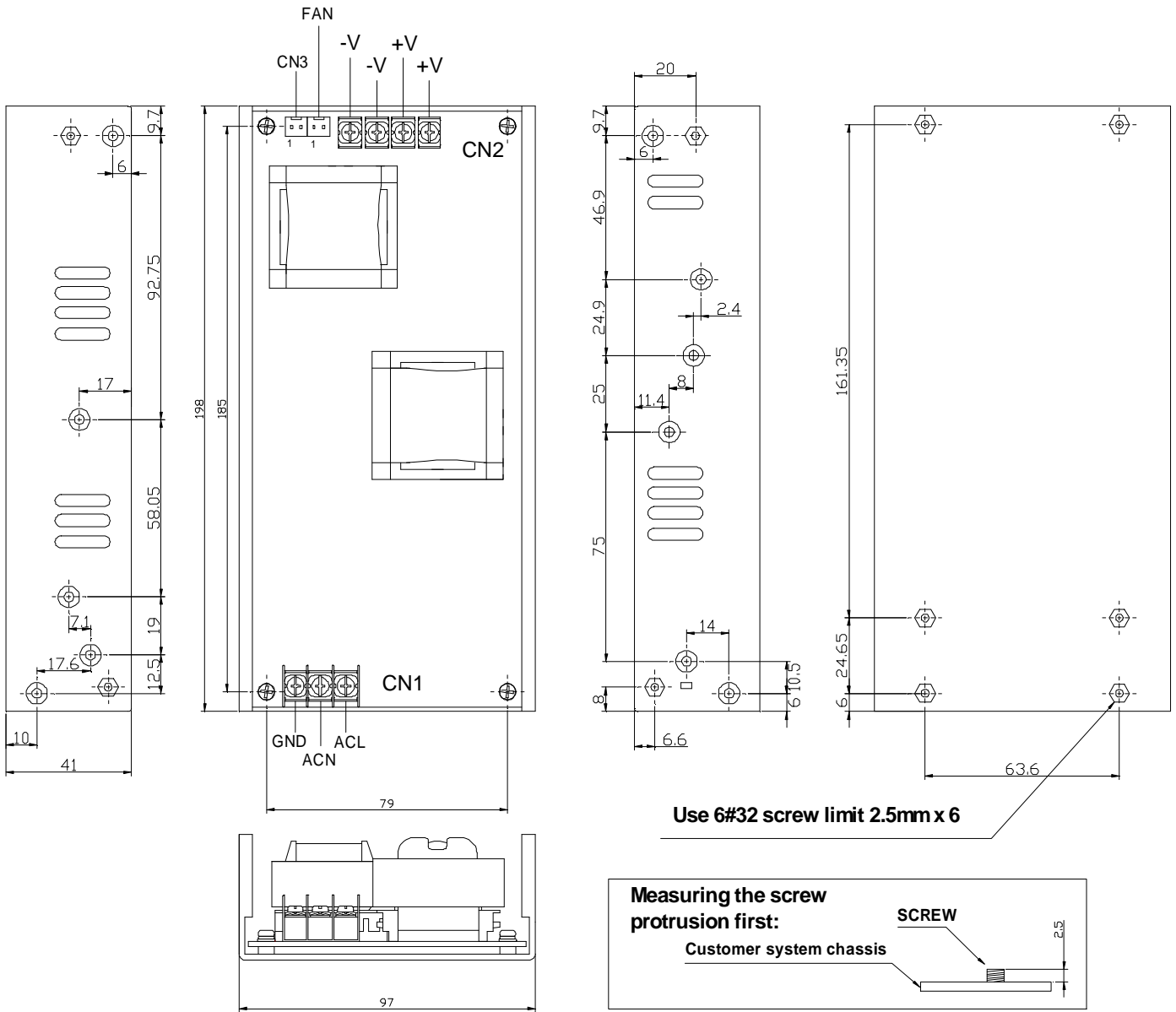
Note: 1) The voltage of fan is the same with the output voltage of power supply, and the output current is 0.5A max.

***Please see the mechanical drawing in next page.**



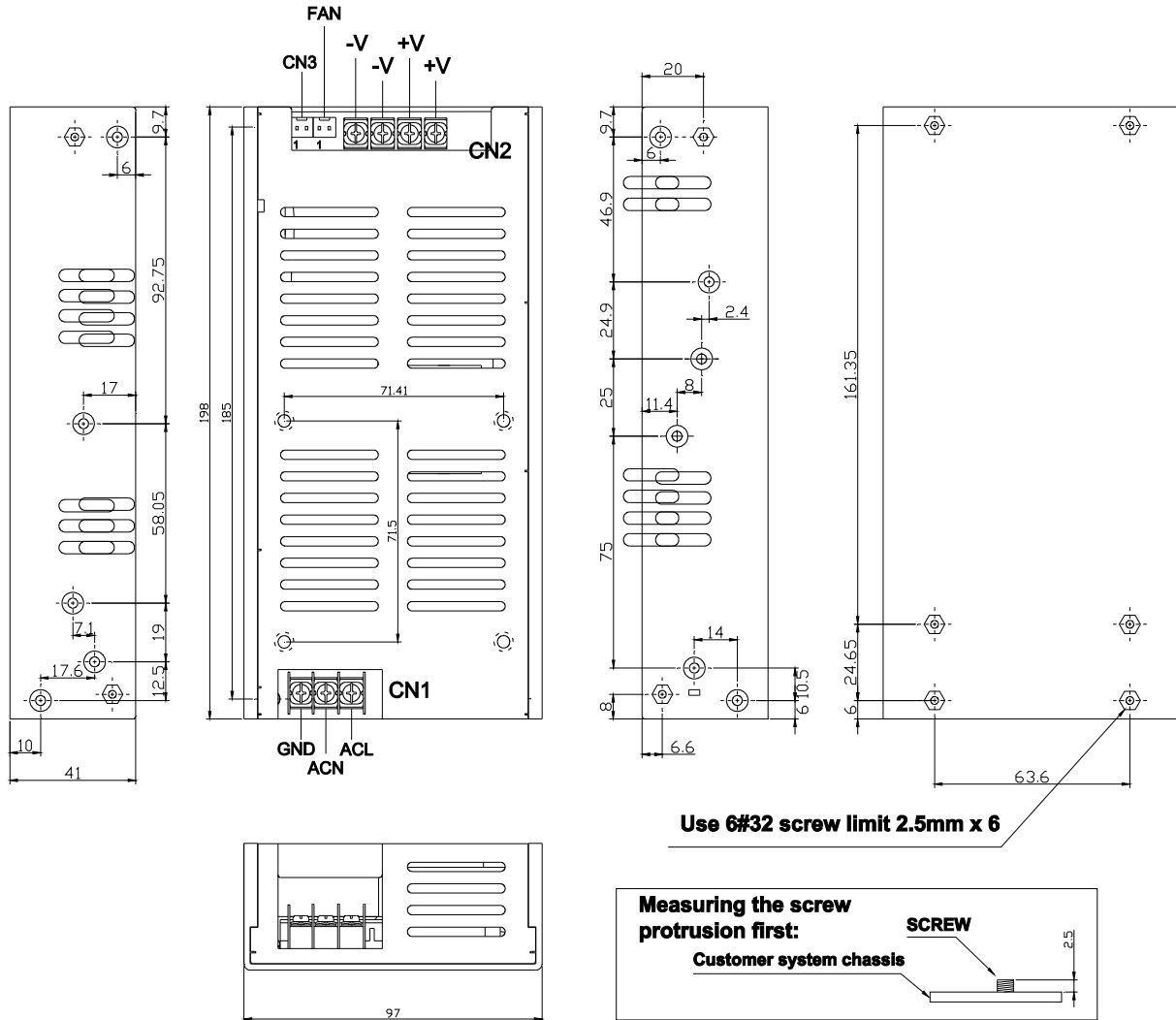
Mechanical drawing

Open frame without cover





With optional cover



Option

Parameter	Conditions/Description	<i>* Please contact us for the availability and pricing</i>
UPS charger module	Additional module available by request separately for UPS charger function.	
Multi outputs module	Additional module available by request separately for multi outputs.	