

# CN-A SERIES

Optimum DC-DC Power Module for Railway Related Instruments

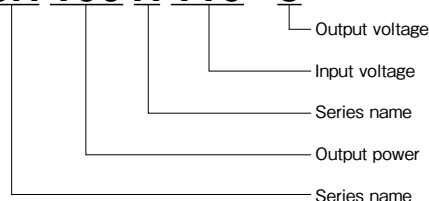


## ■ Features

- Optimum wide input voltage range for Railway Related Instruments, input voltage: 60 to 160 VDC / 14.4 to 36 VDC
- Anti-vibration and shock resistance characteristics conforming to IEC61373
- 5 years free warranty
- Brick shaped utilized (1/4 brick for 30W-50W-100W, 1/2 brick for 200W)

## ■ Model naming method

**CN 100 A 110 - 5**



## ■ Applications



RAIL

## ■ Conformity to RoHS Directive

This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

## ■ Product Line up

Input Voltage	110V							
Output Power	30W		50W		100W		200W	
Type	CN30A110		CN50A110		CN100A110		CN200A110	
Output Voltage	Output Current	Model	Output Current	Model	Output Current	Model	Output Current	Model
5	6	CN30A110-5	10	CN50A110-5	20	CN100A110-5	40	CN200A110-5
12	2.5	CN30A110-12	4.2	CN50A110-12	8.4	CN100A110-12	16.7	CN200A110-12
15	2	CN30A110-15	3.4	CN50A110-15	6.7	CN100A110-15	13.4	CN200A110-15
24	1.3	CN30A110-24	2.1	CN50A110-24	4.2	CN100A110-24	8.4	CN200A110-24

Input Voltage	24V			
Output Power	50W		100W	
Type	CN50A24		CN100A24	
Output Voltage	Output Current	Model	Output Current	Model
5	10	CN50A24-5	20	CN100A24-5
12	4.2	CN50A24-12	8.4	CN100A24-12
24	2.1	CN50A24-24	4.2	CN100A24-24

## CN30A110 Specifications

ITEMS/UNITS		MODEL	CN30A110-5	CN30A110-12	CN30A110-15	CN30A110-24
Input	Voltage Range	V	DC60 - 160			
	Efficiency(typ) (*1)	%	83	84		
	Current (*1)	A	0.34			
Output	Nominal Voltage	VDC	5	12	15	24
	Maximum Current	A	6	2.5	2	1.3
	Maximum Power	W	30			31.2
	Voltage Setting Accuracy (*1)	%	-/+ 1			
	Maximum Line Regulation(*2)	mV	20	48	60	96
	Maximum Load Regulation(*3)	mV	40	96	120	192
	Temperature Coefficient		0.02%/°C			
	Maximum Ripple & Noise (*8)	mVp-p	100	150		240
	Voltage Adjustable Range (*8)	VDC	-10 / +20	-/+ 10		
Function	Over Current Protection (*4)	A	105 - 140			
	Over Voltage Protection(*5)(*7)	VDC	125 - 145 (Inverter shutdown method)			
	Remote Sensing (*7)		Possible			
	Remote ON/OFF Control (*7)		Possible (SHORT : ON OPEN : OFF)			
	Parallel Operation		-			
	Series Operation (*7)		Possible			
Environment	Operating Temperature (*6)	°C	-40 - +100 (Baseplate) Ambient Temperature min=-40°C			
	Storage Temperature	°C	-40 - +100			
	Operating Humidity	% RH	5 - 95 (No Dewdrop)			
	Storage Humidity	% RH	5 - 95 (No Dewdrop)			
	Vibration		At No Operating, 10-55Hz (Sweep for 1min.) Amplitude 0.825mm Constant (Maximum 49.0m/s <sup>2</sup> ) X,Y,Z 1 hour each IEC61373 - Category 1 - Grade B			
	Shock		196.1m/s <sup>2</sup> IEC61373 - Category 1 - Grade B			
	Cooling		Conduction Cooled			
	Isolation	Withstand Voltage (*9)		Input-Baseplate : 1.5kVAC (20mA), Input-Output : 3.0kVAC for 1min. Output-Baseplate : 500VAC for 1min. (20mA).		
Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output-Baseplate...500VDC			
Standards	Safety Standards		Approved by UL60950-1, CSA60950-1, EN60950-1			
Mechanical	Weight(typ)	g	70			
	Size (W×H×D)	mm	36.8 x 12.7 x 57.9 (Refer to Outline Drawing)			

\*1. At 110VDC and maximum output current.  
(Baseplate Temperature = +25°C)

\*2. 60 - 160VDC, Constant load.

\*3. No Load - Full Load, Constant input voltage.

\*4. 5V delay shutdown when left in OCP condition, with the output voltage less than the LVP level.  
12V, 15V and 24V constant current limiting with automatic recovery.

LVP reset : Line off or Control off.

\*5. OVP reset : Line off or Control off.

\*6. Rating - Refer to Derating Curve on the next page.

- Load(%) is percent of maximum output current.

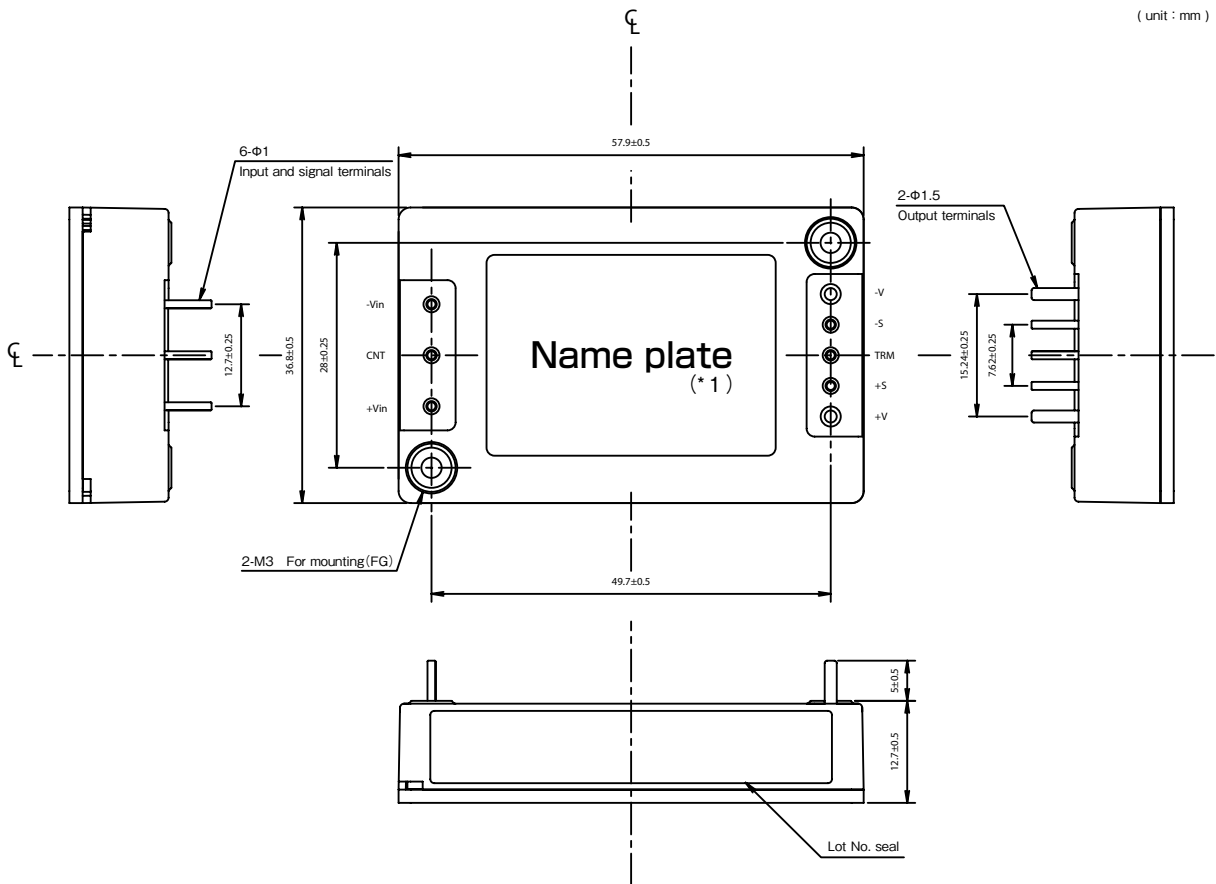
- Refer to Instruction Manual.

\*7. Refer to Instruction Manual.

\*8. External components are needed for operation. (Refer to Basic Connection and Instruction Manual.)

\*9. This specification applies to power supply module as stand-alone.

**CN30A110 Outline Drawing**

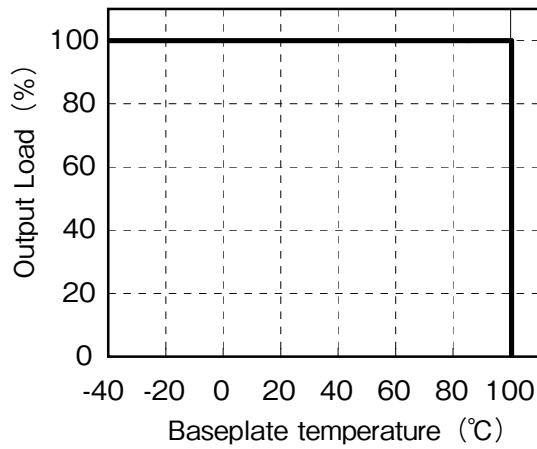


\* Heatsink for 30,50,100W : HAQ-10T

(\* 1) Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking(C-UL-US, TUV & CE marking) are shown here.

**Output Derating**

Derating Curve



## CN50A110 Specifications

ITEMS/UNITS		MODEL	CN50A110-5	CN50A110-12	CN50A110-15	CN50A110-24
Input	Voltage Range	V	DC60 - 160			
	Efficiency(typ) (*1)	%	85	86		
	Current (*1)	A	0.55			
Output	Nominal Voltage	VDC	5	12	15	24
	Maximum Current	A	10	4.2	3.4	2.1
	Maximum Power	W	50	50.4	51.0	50.4
	Voltage Setting Accuracy (*1)	%	-/+ 1			
	Maximum Line Regulation(*2)	mV	20	48	60	96
	Maximum Load Regulation(*3)	mV	40	96	120	192
	Temperature Coefficient		0.02%/°C			
	Maximum Ripple & Noise (*8)	mVp-p	100	150		240
	Voltage Adjustable Range (*8)	VDC	-10 / +20	-/+ 10		
Function	Over Current Protection (*4)	A	105 - 140			
	Over Voltage Protection(*5)(*7)	VDC	125 - 145 (Inverter shutdown method)			
	Remote Sensing (*7)		Possible			
	Remote ON/OFF Control (*7)		Possible (SHORT : ON OPEN : OFF)			
	Parallel Operation		-			
	Series Operation (*7)		Possible			
Environment	Operating Temperature (*6)	°C	-40 - +100 (Baseplate) Ambient Temperature min=-40°C			
	Storage Temperature	°C	-40 - +100			
	Operating Humidity	% RH	5 - 95 (No Dewdrop)			
	Storage Humidity	% RH	5 - 95 (No Dewdrop)			
	Vibration		At No Operating, 10-55Hz (Sweep for 1min.) Amplitude 0.825mm Constant (Maximum 49.0m/s <sup>2</sup> ) X,Y,Z 1 hour each IEC61373 - Category 1 - Grade B			
	Shock		196.1m/s <sup>2</sup> IEC61373 - Category 1 - Grade B			
	Cooling		Conduction Cooled			
	Isolation	Withstand Voltage (*9)		Input-Baseplate : 1.5kVAC (20mA), Input-Output : 3.0kVAC for 1min. Output-Baseplate : 500VAC for 1min. (20mA).		
Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output-Baseplate...500VDC			
Standards	Safety Standards		Approved by UL60950-1, CSA60950-1, EN60950-1			
Mechanical	Weight(typ)	g	70			
	Size (W×H×D)	mm	36.8 x 12.7 x 57.9 (Refer to Outline Drawing)			

\*1. At 110VDC and maximum output current.  
(Baseplate Temperature = +25°C)

\*2. 60 - 160VDC, Constant load.

\*3. No Load - Full Load, Constant input voltage.

\*4. 5V delay shutdown when left in OCP condition, with the output voltage less than the LVP level.

12V, 15V and 24V constant current limiting with automatic recovery.

LVP reset : Line off or Control off.

\*5. OVP reset : Line off or Control off.

\*6. Rating - Refer to Derating Curve on the next page.

- Load(%) is percent of maximum output current.

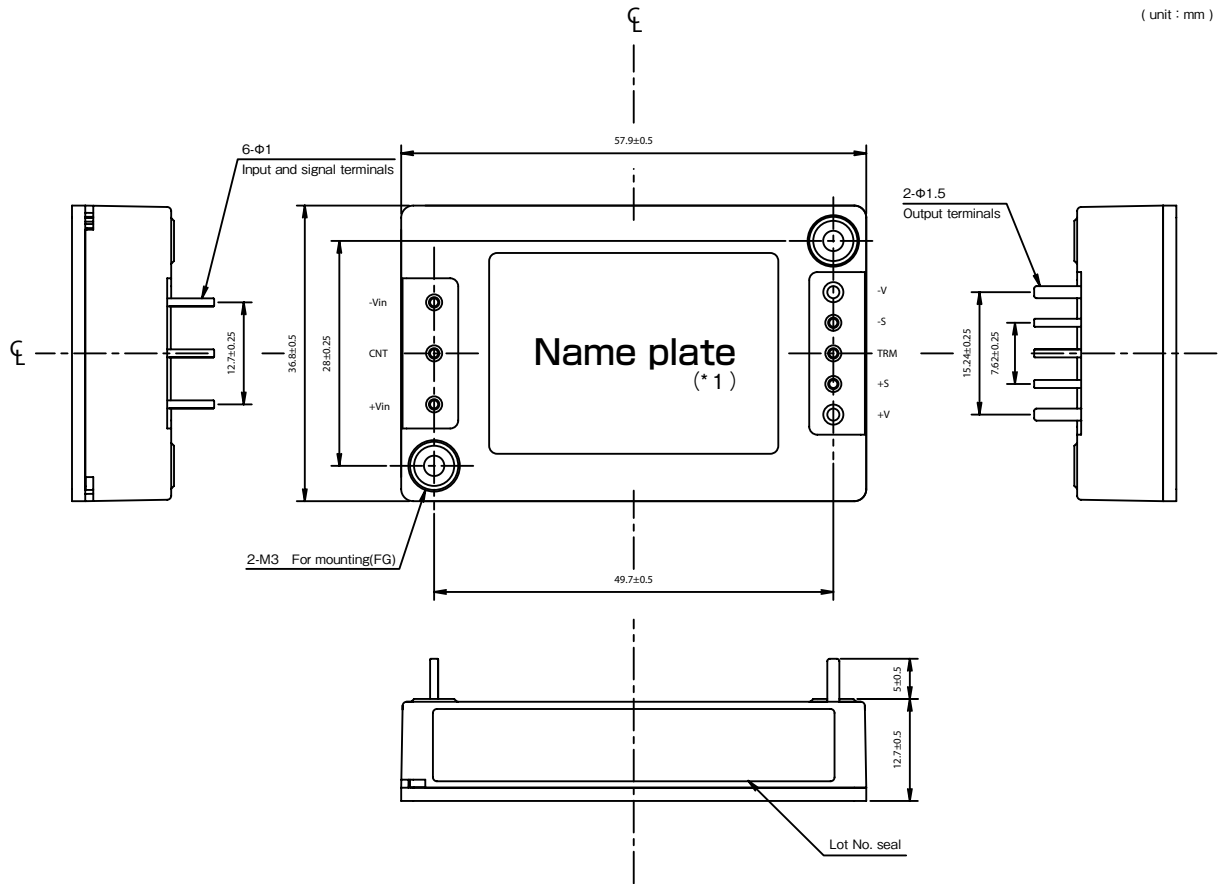
- Refer to Instruction Manual.

\*7. Refer to Instruction Manual.

\*8. External components are needed for operation. (Refer to Basic Connection and Instruction Manual.)

\*9. This specification applies to power supply module as stand-alone.

**CN50A110 Outline Drawing**

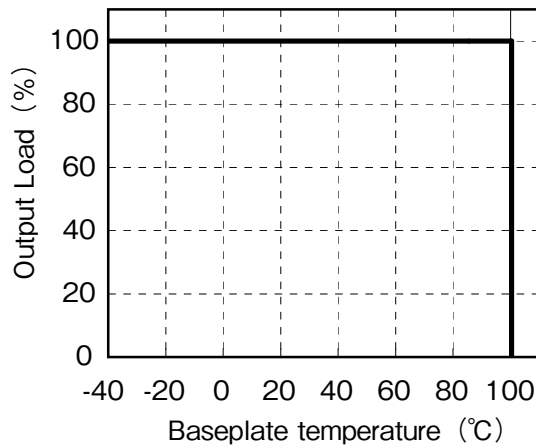


\* Heatsink for 30,50,100W : HAQ-10T

(\* 1) Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking(C-UL-US, TUV & CE marking) are shown here.

**Output Derating**

Derating Curve



## CN100A110 Specifications

ITEMS/UNITS		MODEL	CN100A110-5	CN100A110-12	CN100A110-15	CN100A110-24
Input	Voltage Range	V	DC60 - 160			
	Efficiency(typ) (*1)	%	85	88		
	Current (*1)	A	1.08	1.05		
Output	Nominal Voltage	VDC	5	12	15	24
	Maximum Current	A	20	8.4	6.7	4.2
	Maximum Power	W	100	100.8	100.5	100.8
	Voltage Setting Accuracy (*1)	%	-/+ 1			
	Maximum Line Regulation(*2)	mV	20	48	60	96
	Maximum Load Regulation(*3)	mV	40	96	120	192
	Temperature Coefficient		0.02%/°C			
	Maximum Ripple & Noise (*8)	mVp-p	100	150		240
	Voltage Adjustable Range (*8)	VDC	-10 / +20	-/+ 10		
Function	Over Current Protection (*4)	A	105 - 140			
	Over Voltage Protection(*5)(*7)	VDC	125 - 145 (Inverter shutdown method)			
	Remote Sensing (*7)		Possible			
	Remote ON/OFF Control (*7)		Possible (SHORT : ON OPEN : OFF)			
	Parallel Operation		-			
	Series Operation (*7)		Possible			
Environment	Operating Temperature (*6)	°C	-40 - +100 (Baseplate) Ambient Temperature min=-40°C			
	Storage Temperature	°C	-40 - +100			
	Operating Humidity	% RH	5 - 95 (No Dewdrop)			
	Storage Humidity	% RH	5 - 95 (No Dewdrop)			
	Vibration		At No Operating, 10-55Hz (Sweep for 1min.) Amplitude 0.825mm Constant (Maximum 49.0m/s <sup>2</sup> ) X,Y,Z 1 hour each IEC61373 - Category 1 - Grade B			
	Shock		196.1m/s <sup>2</sup> IEC61373 - Category 1 - Grade B			
	Cooling		Conduction Cooled			
	Isolation	Withstand Voltage (*9)		Input-Baseplate : 1.5kVAC (20mA), Input-Output : 3.0kVAC for 1min. Output-Baseplate : 500VAC for 1min (20mA).		
Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output-Baseplate...500VDC			
Standards	Safety Standards		Approved by UL60950-1, CSA60950-1, EN60950-1			
Mechanical	Weight(typ)	g	70			
	Size (W×H×D)	mm	36.8 x 12.7 x 57.9 (Refer to Outline Drawing)			

\*1. At 110VDC and maximum output current.  
(Baseplate Temperature = +25°C)

\*2. 60 - 160VDC, Constant load.

\*3. No Load - Full Load, Constant input voltage.

\*4. 5V delay shutdown when left in OCP condition, with the output voltage less than the LVP level.

12V, 15V and 24V constant current limiting with automatic recovery.

LVP reset : Line off or Control off.

\*5. OVP reset : Line off or Control off.

\*6. Rating - Refer to Derating Curve on the next page.

- Load(%) is percent of maximum output current.

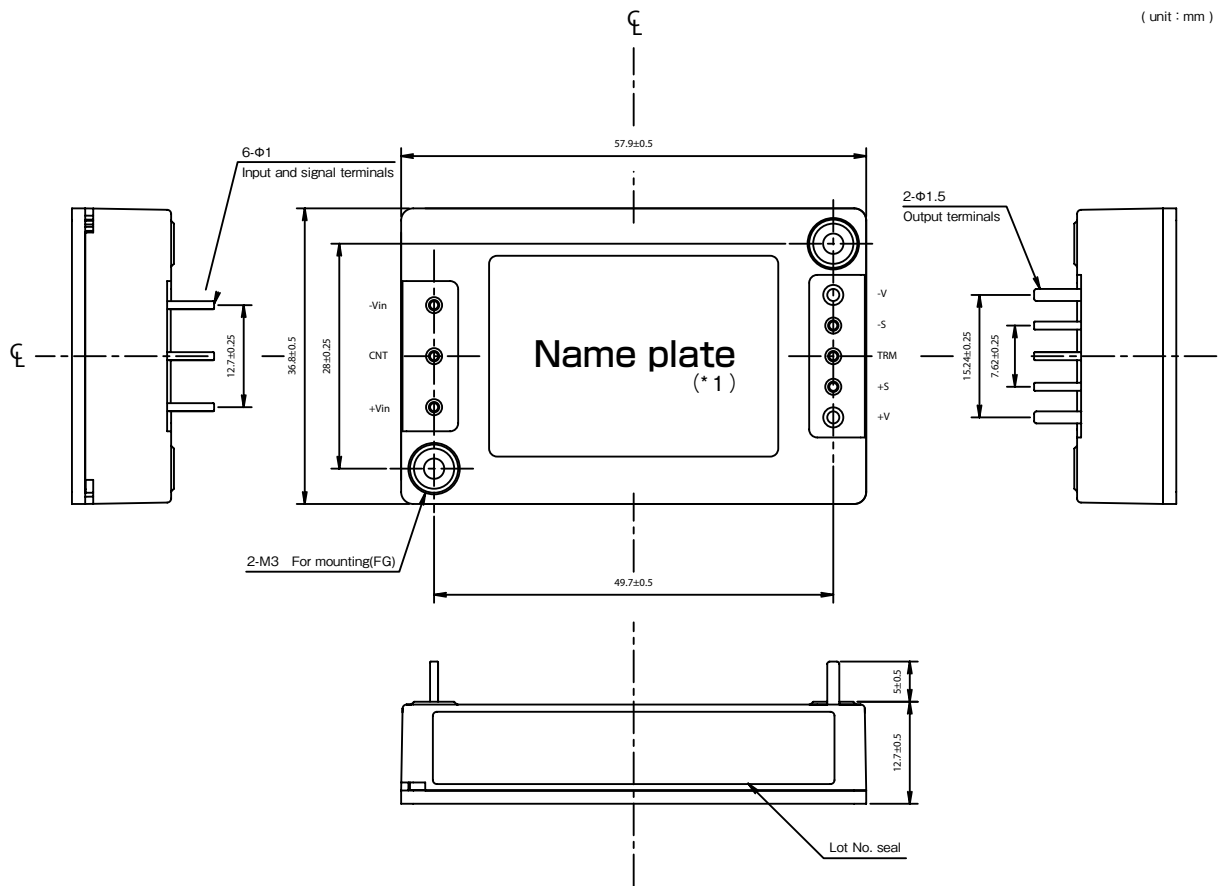
- Refer to Instruction Manual.

\*7. Refer to Instruction Manual.

\*8. External components are necessary for operation. (Refer to Basic Connection and Instruction Manual.)

\*9. This specification applies to power supply module as stand-alone.

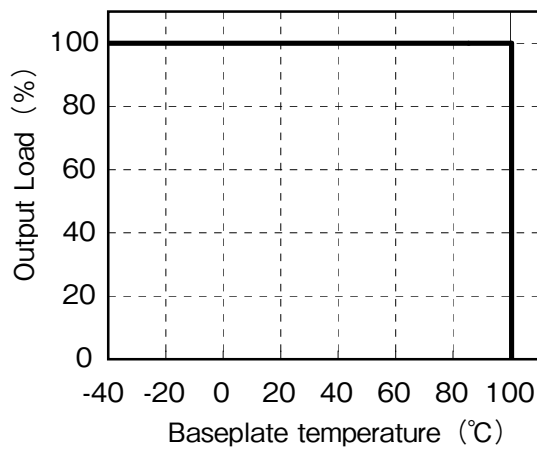
**CN100A110 Outline Drawing**



\* Heatsink for 30,50,100W : HAQ-10T  
 (\* 1) Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking(C-UL-US, TUV & CE marking) are shown here.

**Output Derating**

Derating Curve



## CN200A110 Specifications

ITEMS/UNITS		MODEL	CN200A110-5	CN200A110-12	CN200A110-15	CN200A110-24
Input	Voltage Range	V	DC60 - 160			
	Efficiency(typ) (*1)	%	85	88		
	Current (*1)	A	2.16	2.09	2.10	2.11
Output	Nominal Voltage	VDC	5	12	15	24
	Maximum Current	A	40	16.7	13.4	8.4
	Maximum Power	W	200	200.4	201.0	201.6
	Voltage Setting Accuracy (*1)	%	-/+ 1			
	Maximum Line Regulation(*2)	mV	20	48	60	96
	Maximum Load Regulation(*3)	mV	40	96	120	192
	Temperature Coefficient		0.02%/°C			
	Maximum Ripple & Noise (*8)	mVp-p	100	150		240
	Voltage Adjustable Range (*8)	VDC	-10 / +20	-/+ 10		
	Function	Over Current Protection (*4)	A	105 - 140		
Over Voltage Protection(*5)(*7)		VDC	125 - 145 (Inverter shutdown method)			
Remote Sensing (*7)			Possible			
Remote ON/OFF Control (*7)			Possible (SHORT : ON OPEN : OFF)			
Parallel Operation (*7)			-	Possible		
Series Operation (*7)			Possible			
Environment	Operating Temperature (*6)	°C	-40 - +100 (Baseplate) Ambient Temperature min=-40°C			
	Storage Temperature	°C	-40 - +100			
	Operating Humidity	% RH	5 - 95 (No Dewdrop)			
	Storage Humidity	% RH	5 - 95 (No Dewdrop)			
	Vibration		At No Operating, 10-55Hz (Sweep for 1min.) Amplitude 0.825mm Constant (Maximum 49.0m/s <sup>2</sup> ) X,Y,Z 1 hour each IEC61373 - Category 1 - Grade B			
	Shock		196.1m/s <sup>2</sup> IEC61373 - Category 1 - Grade B			
	Cooling		Conduction Cooled			
	Isolation	Withstand Voltage (*9)		Input-Baseplate : 1.5kVAC (20mA), Input-Output : 3.0kVAC for 1min. Output-Baseplate : 500VAC for 1min. (20mA).		
Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output-Baseplate...500VDC			
Standards	Safety Standards		Designed to meet UL60950-1, CSA60950-1, EN60950-1			
Mechanical	Weight(typ)	g	100			
	Size (W×H×D)	mm	61.0 x 12.7 x 57.9 (Refer to Outline Drawing)			

\*1. At 110VDC and maximum output current.  
(Baseplate Temperature = +25°C)

\*2. 60 - 160VDC, Constant load.

\*3. No Load - Full Load, Constant input voltage.

\*4. 5V delay shutdown when left in OCP condition, with the output voltage less than the LVP level.

12V, 15V and 24V constant current limiting with automatic recovery.

LVP reset : Line off or Control off.

\*5. OVP reset : Line off or Control off.

\*6. Rating - Refer to Derating Curve on the next page.

- Load(%) is percent of maximum output current.

- Refer to Instruction Manual.

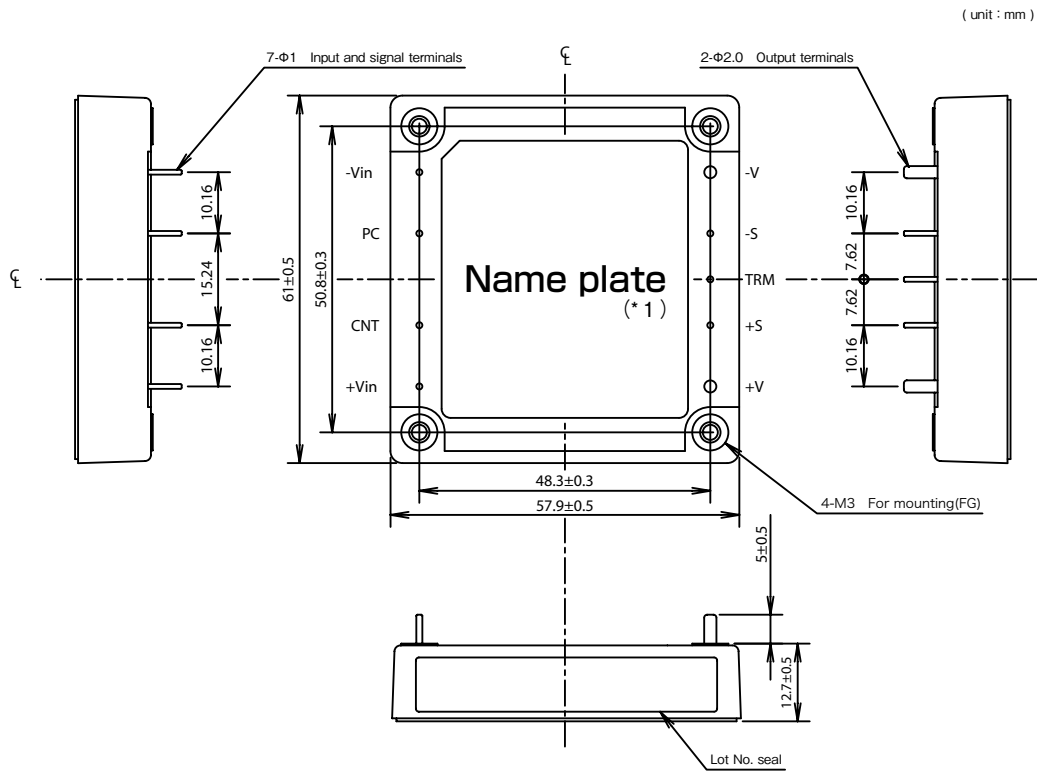
\*7. Refer to Instruction Manual.

\*8. External components are needed for operation. (Refer to Basic Connection and Instruction Manual.)

\*9. This specification applies to power supply module as stand-alone.

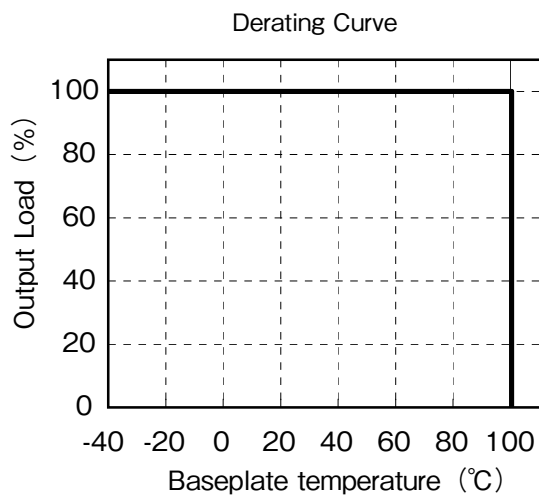


**CN200A110 Outline Drawing**



\* Heatsink for 200W: HAH-10T, HAH-10L, HAH-15L  
 (\* 1 ) Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking(C-UL-US, TUV & CE marking) are shown here.

**Output Derating**



## CN50A24 Specifications

ITEMS/UNITS		MODEL	CN50A24-5	CN50A24-12	CN50A24-24
Input	Voltage Range	V	DC14.4 - 36 (40V transient for 3sec)		
	Efficiency(typ)	(*1) %	85	86	
	Current	(*1) A	2.48	2.47	
Output	Nominal Voltage	VDC	5	12	24
	Maximum Current	A	10	4.2	2.1
	Maximum Power	W	50	50.4	
	Voltage Setting Accuracy (*1)	%	-/+ 1		
	Maximum Line Regulation(*2)	mV	20	48	96
	Maximum Load Regulation(*3)	mV	40	96	192
	Temperature Coefficient		0.02%/°C		
	Maximum Ripple & Noise (*8)	mVp-p	100	150	240
	Voltage Adjustable Range (*8)	VDC	-10 / +20	-/+ 10	
	Function	Over Current Protection (*4)	A	105 - 140	
Over Voltage Protection(*5)(*7)		VDC	125 - 145 (Inverter shutdown method)		
Remote Sensing (*7)			Possible		
Remote ON/OFF Control (*7)			Possible (SHORT : ON OPEN : OFF)		
Parallel Operation			-		
Series Operation (*7)			Possible		
Environment	Operating Temperature (*6)	°C	-40 - +100 (Baseplate) Ambient Temperature min=-40°C		
	Storage Temperature	°C	-40 - +100		
	Operating Humidity	% RH	5 - 95 (No Dewdrop)		
	Storage Humidity	% RH	5 - 95 (No Dewdrop)		
	Vibration		At No Operating, 10-55Hz (Sweep for 1min.) Amplitude 0.825mm Constant (Maximum 49.0m/s <sup>2</sup> ) X,Y,Z 1 hour each IEC61373 - Category 1 - Grade B		
	Shock		196.1m/s <sup>2</sup> IEC61373 - Category 1 - Grade B		
	Cooling		Conduction Cooled		
	Isolation	Withstand Voltage (*9)		Input-Baseplate : 2.0kVAC for 1min. (20mA), Input-Output : 3.0kVAC for 1min. (20mA). Output-Baseplate : 500VAC for 1min.(20mA).	
Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output-Baseplate...500VDC		
Standards	Safety Standards		Designed to meet UL60950-1, CSA60950-1, EN60950-1		
Mechanical	Weight(typ)	g	70		
	Size (W×H×D)	mm	36.8 x 12.7 x 57.9 (Refer to Outline Drawing)		

\*1. At 24VDC and maximum output current.  
(Baseplate Temperature = +25°C)

\*2. 14.4 - 36VDC, Constant load.

\*3. No Load - Full Load, Constant input voltage.

\*4. 5V delay shutdown when left in OCP condition, with the output voltage less than the LVP level.

12V and 24V constant current limiting with automatic recovery.

LVP reset : Line off or Control off.

\*5. OVP reset : Line off or Control off.

\*6. Rating - Refer to Derating Curve on the next page.

- Load(%) is percent of maximum output current.

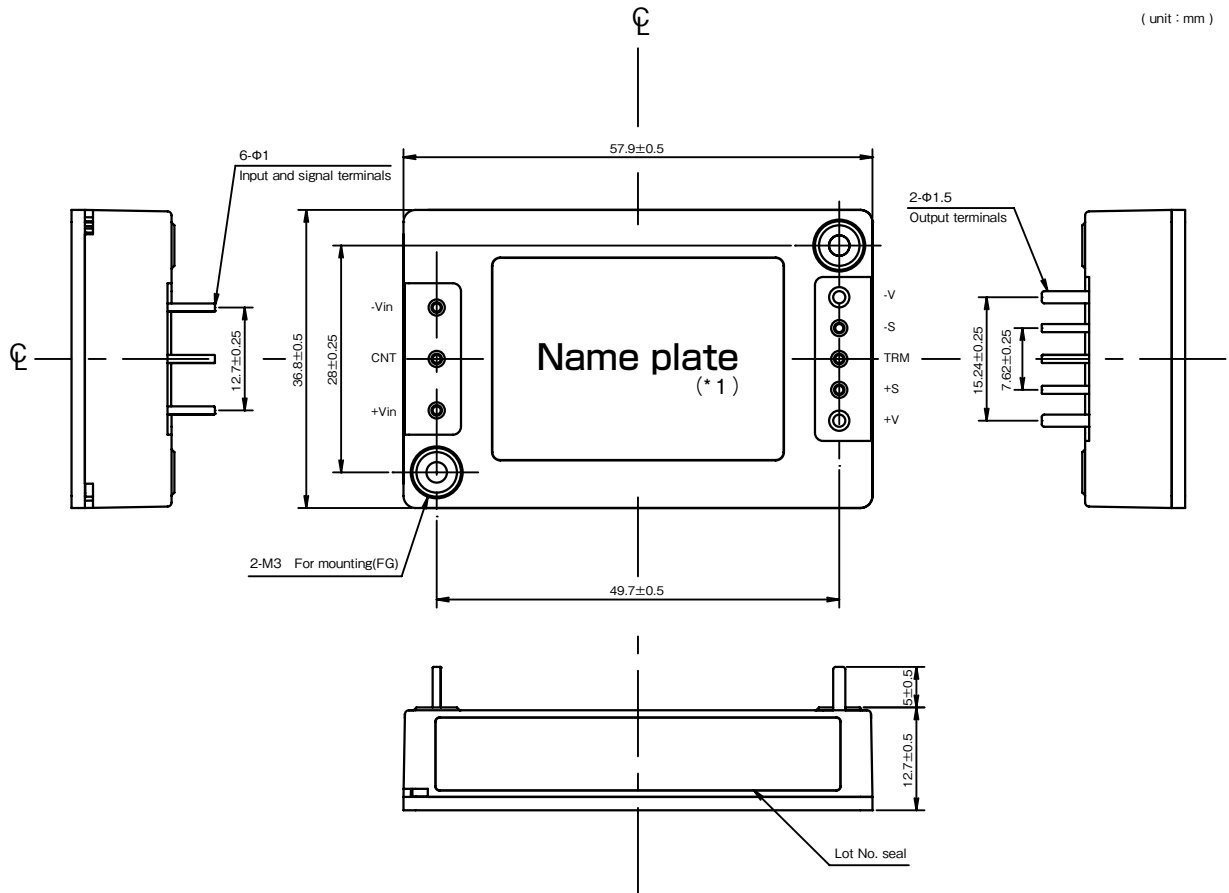
- Refer to Instruction Manual.

\*7. Refer to Instruction Manual.

\*8. External components are necessary for operation. (Refer to Basic Connection and Instruction Manual.)

\*9. This specification applies to power supply module as stand-alone.

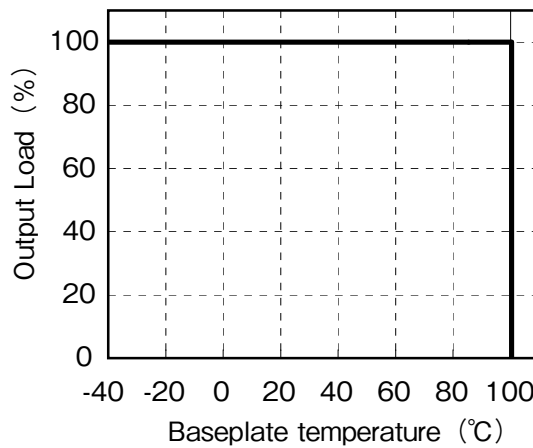
**CN50A24 Outline Drawing**



\* Heatsink for 30,50,100W : HAQ-10T  
 (\* 1 ) Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking(C-UL-US, TUV & CE marking) are shown here.

**Output Derating**

Derating Curve



## CN100A24 Specifications

ITEMS/UNITS		MODEL	CN100A24-5	CN100A24-12	CN100A24-24
Input	Voltage Range	V	DC14.4 - 36 (40V transient for 3sec)		
	Efficiency(typ) (*1)	%	86	88	
	Current (*1)	A	4.91	4.83	
Output	Nominal Voltage	VDC	5	12	24
	Maximum Current	A	20	8.4	4.2
	Maximum Power	W	100	100.8	
	Voltage Setting Accuracy (*1)	%	-/+ 1		
	Maximum Line Regulation(*2)	mV	20	48	96
	Maximum Load Regulation(*3)	mV	40	96	192
	Temperature Coefficient		0.02%/°C		
	Maximum Ripple & Noise (*8)	mVp-p	100	150	240
	Voltage Adjustable Range (*8)	VDC	-10 / +20	-/+ 10	
	Function	Over Current Protection (*4)	A	105 - 140	
Over Voltage Protection(*5)(*7)		VDC	125 - 145 (Inverter shutdown method)		
Remote Sensing (*7)			Possible		
Remote ON/OFF Control (*7)			Possible (SHORT : ON OPEN : OFF)		
Parallel Operation			-		
Series Operation (*7)			Possible		
Environment	Operating Temperature (*6)	°C	-40 - +100 (Baseplate) Ambient Temperature min=-40°C		
	Storage Temperature	°C	-40 - +100		
	Operating Humidity	% RH	5 - 95 (No Dewdrop)		
	Storage Humidity	% RH	5 - 95 (No Dewdrop)		
	Vibration		At No Operating, 10-55Hz (Sweep for 1min.) Amplitude 0.825mm Constant (Maximum 49.0m/s <sup>2</sup> ) X,Y,Z 1 hour each IEC61373 - Category 1 - Grade B		
	Shock		196.1m/s <sup>2</sup> IEC61373 - Category 1 - Grade B		
	Cooling		Conduction Cooled		
	Isolation	Withstand Voltage (*9)		Input-Baseplate : 2.0kVAC for 1min. (20mA), Input-Output : 3.0kVAC for 1min. (20mA). Output-Baseplate : 500VAC for 1min. (20mA).	
Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output-Baseplate...500VDC		
Standards	Safety Standards		Designed to meet UL60950-1, CSA60950-1, EN60950-1		
Mechanical	Weight(typ)	g	70		
	Size (W×H×D)	mm	36.8 x 12.7 x 57.9 (Refer to Outline Drawing)		

\*1. At 24VDC and maximum output current.  
(Baseplate Temperature = +25°C)

\*2. 14.4 - 36VDC, Constant load.

\*3. No Load - Full Load, Constant input voltage.

\*4. 5V delay shutdown when left in OCP condition, with the output voltage less than the LVP level.

12V and 24V constant current limiting with automatic recovery.

LVP reset : Line off or Control off.

\*5. OVP reset : Line off or Control off.

\*6. Rating - Refer to Derating Curve on the next page.

- Load(%) is percent of maximum output current.

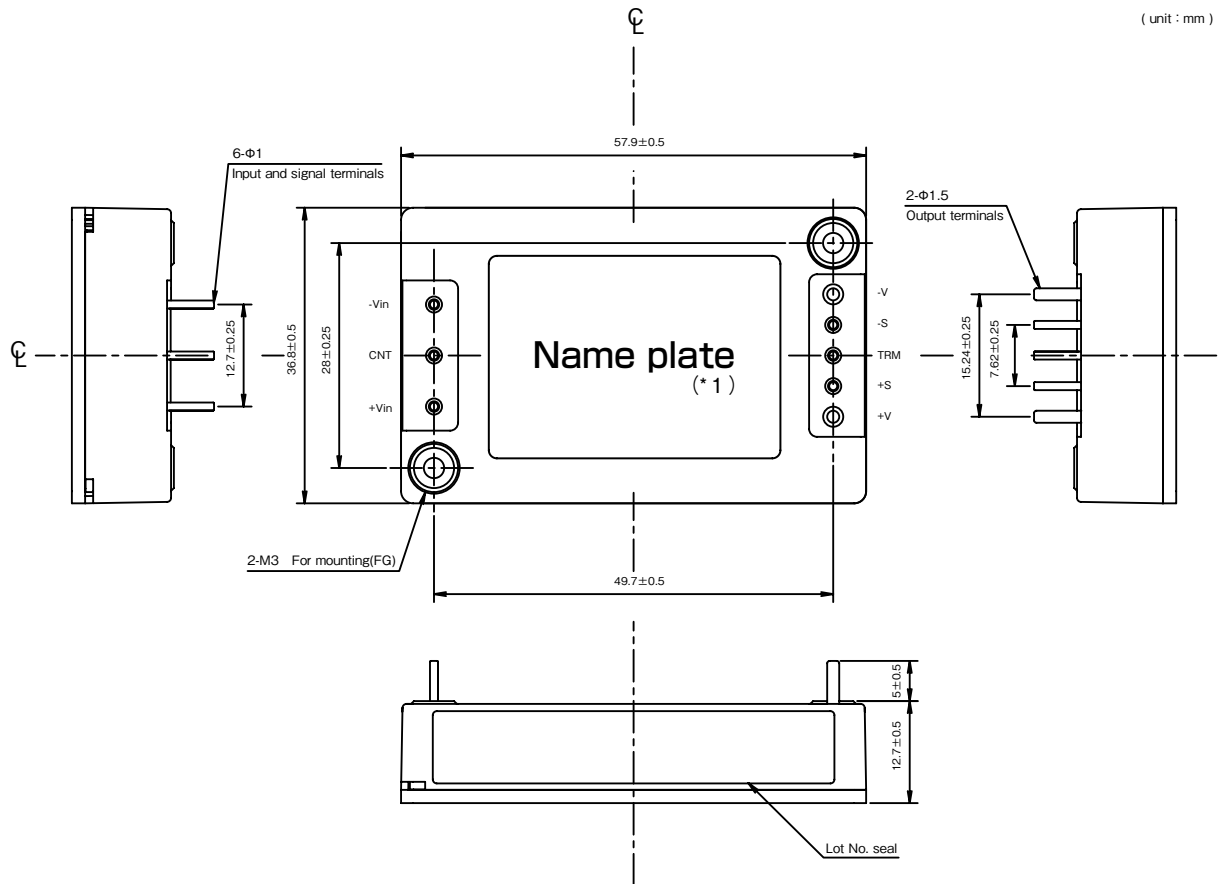
- Refer to Instruction Manual.

\*7. Refer to Instruction Manual.

\*8. External components are necessary for operation. (Refer to Basic Connection and Instruction Manual.)

\*9. This specification applies to power supply module as stand-alone.

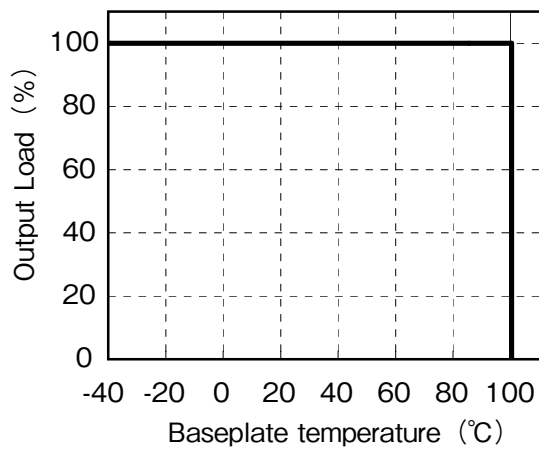
**CN100A24 Outline Drawing**



\* Heatsink for 30,50,100W : HAQ-10T  
 (\* 1 ) Model name, input voltage range, nominal output voltage, maximum output current, country of manufacture and safety marking(C-UL-US, TUV & CE marking) are shown here.

**Output Derating**

Derating Curve



***TDK·Lambda***

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