

Scope

This specification applies to built-in DC stabilized power supply, model : mUZPT-120-**-J***-*. In addition, all items in this specification shall be provided at nominal temperature and humidity unless otherwise specified.

Model Name Coding

Example : mUZPT-120-12-JB0□-C
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ①Series Name....."mUZPT" : mUZPT series
- ②Continuous output power..... "120" : 120W
 (12-J0L type,12-JB0 type,15-J0L type,15-JB0 type:100W)
- ③Output voltage....."12" : 12V,"15" : 15V,"24" : 24V
- ④Input/Output connector type....."J" : Nylon connector
- ⑤Optional joint connector....."0" : without connector,"B" : with connector
- ⑥Presence or absence of function
 "L" : Without output ON/OFF control signal, Without variable resistor to adjust output voltage
 "O" : With output ON/OFF control signal, With variable resistor to adjust output voltage
 "H" : With output ON/OFF control signal, With variable resistor to adjust output voltage, high-efficiency type
- ⑦Modification....."Blank" : Standard, "1 to 9"or"A to Z" : Modification symbol
- ⑧Chassis....."C" : With chassis,"K" : With chassis and cover,"Blank" : Without chassis and cover

General specification

Items		specification				Measurement conditions, etc.	
		mUZPT-120-					
		12 / 15		24			
		-J0L, -JB0	-JBH	-J0L, -JB0	-JBH		
AC input	Rated voltage	100-240VAC				World wide range	
	Voltage range	85-264VAC				Load factor shall be 95-100% in range of 85-90VAC input.	
	Current	At 100VAC	1.16Atyp	1.35Atyp	1.35Atyp	1.32Atyp	At continuous rated output1
			1.87Atyp	1.83Atyp	1.82Atyp	1.78Atyp	At continuous rated output2
		At 200VAC	0.62Atyp	0.73Atyp	0.72Atyp	0.71Atyp	At continuous rated output1
			1.00Atyp	0.98Atyp	0.98Atyp	0.96Atyp	At continuous rated output2
	Rated Frequency	50-60 Hz				Frequency range 47-63Hz	
	Inrush current	At 100VAC	17Atyp				Power thermistor system At cold start(25°C)
		At 200VAC	34Atyp				
	Efficiency	At 100VAC	87.5%typ	89.5%typ	90.0%typ	92.0%typ	At 100W load
At 200VAC		90.0%typ	91.5%typ	92.0%typ	94.0%typ		
Power factor	At 100VAC	99%typ				At continuous rated output1	
	At 200VAC	90%typ					
Input voltage momentary fluctuation	70VAC / 500m sec					At 90W load	
	40VAC / 100m sec						

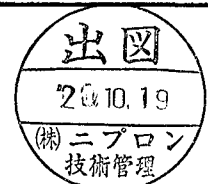
Note



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Items		Specification		Measurements conditions, etc.					
		12 / 15	24						
Environment	Operating Temp.	Natural air cooling	-10 to 60°C (Open frame)	Refer to "Output derating specification"					
			-10 to 55°C (With chassis and cover)						
	Forced air cooling	-10 to 70°C (Open frame)	Refer to "Output derating specification"						
		-10 to 70°C (With chassis and cover)							
	Operating Humidity	20 to 90%RH							
Storage Temp./Humidity	-20 to 85°C / 10 to 95%RH		There shall be no condensation						
Vibration	To endure the vibration acceleration of 2G with vibration frequency of 10 to 55 Hz for 10 sweep cycles in each X,Y,Z direction.		Follow JIS-C-60068-2-6 At no operation						
Mechanical Shock (surface drop)	Left one bottom edge of the unit 50mm high with the opposite edge placed in the test bench, and let it fall. Repeat 3 times for each of 4 bottom edges, and no malfunction shall be observed.		Follow JIS-C-60068-2-31 At no operation						
Insulation	Dielectric strength	4kV/1 minute between input and output/RC		Cut-off current 10mA					
		2kVAC/1 minute between input and FG		Cut-off current 10mA					
		500VAC/1 minute between each output/RC/FG		Cut-off current 100mA					
	Insulation resistance	50MΩ min. between each input/output/RC/FG		At 500VDC					
Leakage current	0.06mA typ.(At 100VAC) 0.12mA typ.(At 200VAC)								
Others	Electrostatic Discharge	IEC61000-4-2 test level 3 compliant (Contact discharge ±6kV,10times)		Apply to FG and chassis. There shall be no malfunction, nor failure.					
	Line noise immunity	±2000V(pulse width 100/1000nS, cycle period of 30 to 100Hz, Normal/Common mode with Positive/Negative polarity for 10 minutes)		There shall be no fluctuation of DC output or malfunction.					
	Impulse voltage immunity	IEC-61000-4-5(Installation environment 3) compliant; apply 5 times each of Common mode±4kVand Normal mode ±2kV		There shall be no malfunction, nor failure.					
	Conducted emission	VCCI,FCC,CISPR22, and EN55022 class B compliant		Rated input and continuous rated output. Measured with chassis.					
	Harmonic current regulations	IEC61000-3-2(edition 2.1) class D, EN61000-3-2(A14) class D compliant		Rated input and continuous rated output.					
	Safety standard	UL60601-1,CSA C22.2 NO.601.1(c-UL), ANSI/AAMI ES60601-1		IEC60601-1(2nd) and (3rd, MOPP, MOOP)					
		UL60950-1,CSA60950-1(c-UL), CE Marking(IEC62368-1) $\Delta\Delta$							
				PSE(Ordinance item 2) compliant					
	Cooling system	Natural air cooling							
Dimension and Weight	62mm×34mm×155mm(W×H×D) / 260g typ.		Without chassis and cover						
	72mm×45mm×185mm(W×H×D) / 450g typ.		With chassis and cover						
Warranty	Three years after delivery: if any defects belong to us, the defective unit shall be repaired or replaced at our cost.		Except for errors caused by operation not specified in this specification.						
Note				Δ × 1:2020.06.16 Nakagawa 1-320203A Δ × 1:2020.02.05 Nakagawa 1-320203					
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Output specification										
Items		Specification						Measurements conditions, etc.		
		12		15		24				
		-JOL, -JBO	-JBH	-JOL, -JBO	-JBH	-JOL,-JBO -JBH				
Output rating	Rated Voltage		12V		15V		24V			
	Continuous rated output1 (Natural air cooling)	Current	8.4A	10.0A	6.7A	8.0A	5.0A		At rated input. Refer to "Output derating specification".	
		Power	100.8 W	120.0 W	100.5 W	120.0 W	120.0W			
	Continuous rated output2 (Forced air cooling)	Current	13.5A		10.8A		6.75A			
		Power	162W		162W		162W			
	Peak rated output (10s Max.)	Current	16.7A		13.4A		8.4A			Refer to "Peak output specification". Natural air cooling and forced air cooling.
Power		200.4W		201.0W		201.6W				
Output characteristics	Factory Setting		-JOL: 12V±4% -JBO: 12V±2%	-JBH: 12V±2%	-JOL: 15V±4% -JBO: 15V±2%	-JBH: 15V±2%	-JOL: 24V±4% -JBO: 24V±2%	-JBH: 24V±2%	At continuous rated output1	
	Adjustable Voltage Range		12V -5%, +10%		15V -5%, +10%		24V -5%, +20%		*1	
	Static Input Regulation		48mV max.		60mV max.		94mV max.			
	Static Load Regulation		100mV max.		112mV max.		150mV max.			
	Temperature Regulation		0.02%/°C max.							
	Ripple Voltage	0 to +70°C	120mVp-p max.							
		-10 to 0°C	160mVp-p max.							
	Spike Voltage	0 to +70°C	150mVp-p max.							
-10 to 0°C		180mVp-p max.								
Protection circuit	Over Current Protection	OCP Point	101% min. of peak rated current							
		Method	Blocking oscillation							
		Recovery	Automatic recovery							
	Over Voltage Protection	OVP Point	13.8 to 16.2V	17.3 to 20.3V	30.0 to 35.0V					
		Method	Output shutdown(latch lock)							
		Recovery	Reclosing of AC input							
<p>Note</p> <p>*1. mUZPT-120-**-J*L-* is equipped without this function.</p>										



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Signal Input/Output Specification

Items	Specification	Signal circuit														
	mUZPT-120															
Input signal	<p>*2. Output ON/OFF control signal (RC signal)</p> <p>Operating mode</p> <table border="1"> <tr> <td>Between +RC and -RC</td> <td>CH1 Output</td> </tr> <tr> <td>SW ON(4.5V min.)</td> <td>ON</td> </tr> <tr> <td>SW OFF(0.8Vmax.)</td> <td>OFF</td> </tr> </table> <p>External power supply and Load-limiting resistor</p> <table border="1"> <tr> <td>External power supply : E</td> <td>Load-limiting resistor : R</td> </tr> <tr> <td>4.5 to 12.5VDC</td> <td>Not required</td> </tr> <tr> <td>12.5 to 30VDC</td> <td>1.5kΩ</td> </tr> <tr> <td>30 to 48VDC</td> <td>8.2kΩ</td> </tr> </table> <p>Shorting Plug With shorting plug(CN2) connected, Output starts up when AC input is applied regardless of RC signal. To control start/stop of output by RC signal, uncap shorting plug of CN2.</p> <p>Besides, when start/stop of output controlled by RC signal, make sure to operate RC signal after equipped switch or relay etc. in the route.</p> <p>Note: Shorting Plug (CN2) is primary circuit components. Make sure to operate the plug after the AC input is turned off.</p>	Between +RC and -RC	CH1 Output	SW ON(4.5V min.)	ON	SW OFF(0.8Vmax.)	OFF	External power supply : E	Load-limiting resistor : R	4.5 to 12.5VDC	Not required	12.5 to 30VDC	1.5kΩ	30 to 48VDC	8.2kΩ	<p>Connecting example in the case of using external power supply</p>
	Between +RC and -RC	CH1 Output														
SW ON(4.5V min.)	ON															
SW OFF(0.8Vmax.)	OFF															
External power supply : E	Load-limiting resistor : R															
4.5 to 12.5VDC	Not required															
12.5 to 30VDC	1.5kΩ															
30 to 48VDC	8.2kΩ															

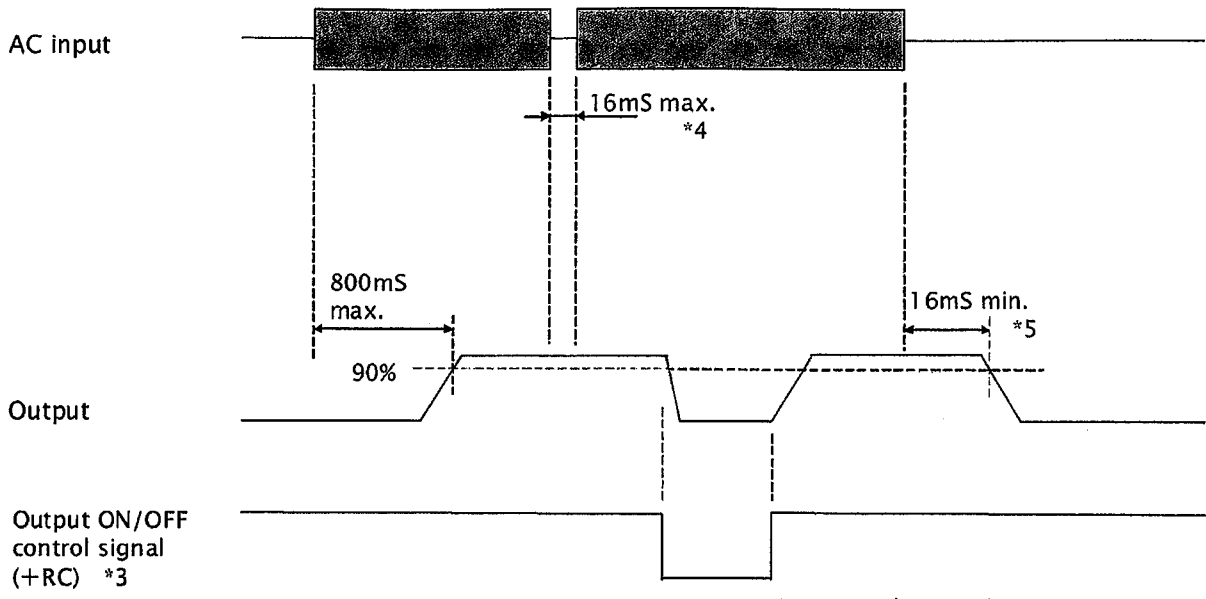
Note

*2. Model:mUZPT-120-**-J*L-* is equipped without this function.



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●Sequence Timing Diagram



*4 At rated input, 80W output
 *5 At rated input, 100W output

*3 Model:mUZPT-120-**-J*L is equipped without the function of output ON/OFF control.

Note



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● Peak Output Specification

Peak output current shall meet the conditions below.

- Duty ratio of peak current shall be 30% or less.
- Energized period of peak current shall be 10 seconds or less.
- In the case that the ambient temperature is 40°C or higher with natural air cooling, the energized period of peak current shall be 5 seconds or less.
- The value resulting from the formula below shall not exceed the continuous rated current, I_o , after derating specified in "Output derating" item.

$$\sqrt{((I_p^2 \times D) + (I_m^2 \times (1 - D)))} \leq I_o$$

I_p = Peak current value

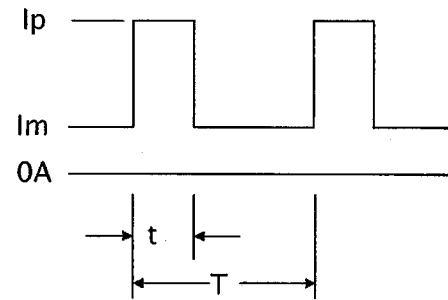
I_m = Min. current value

D = Duty ratio, t/T

t = Pulse width of peak current

T = Cycle

I_o = Continuous rated current specified in "Output derating" item



Note

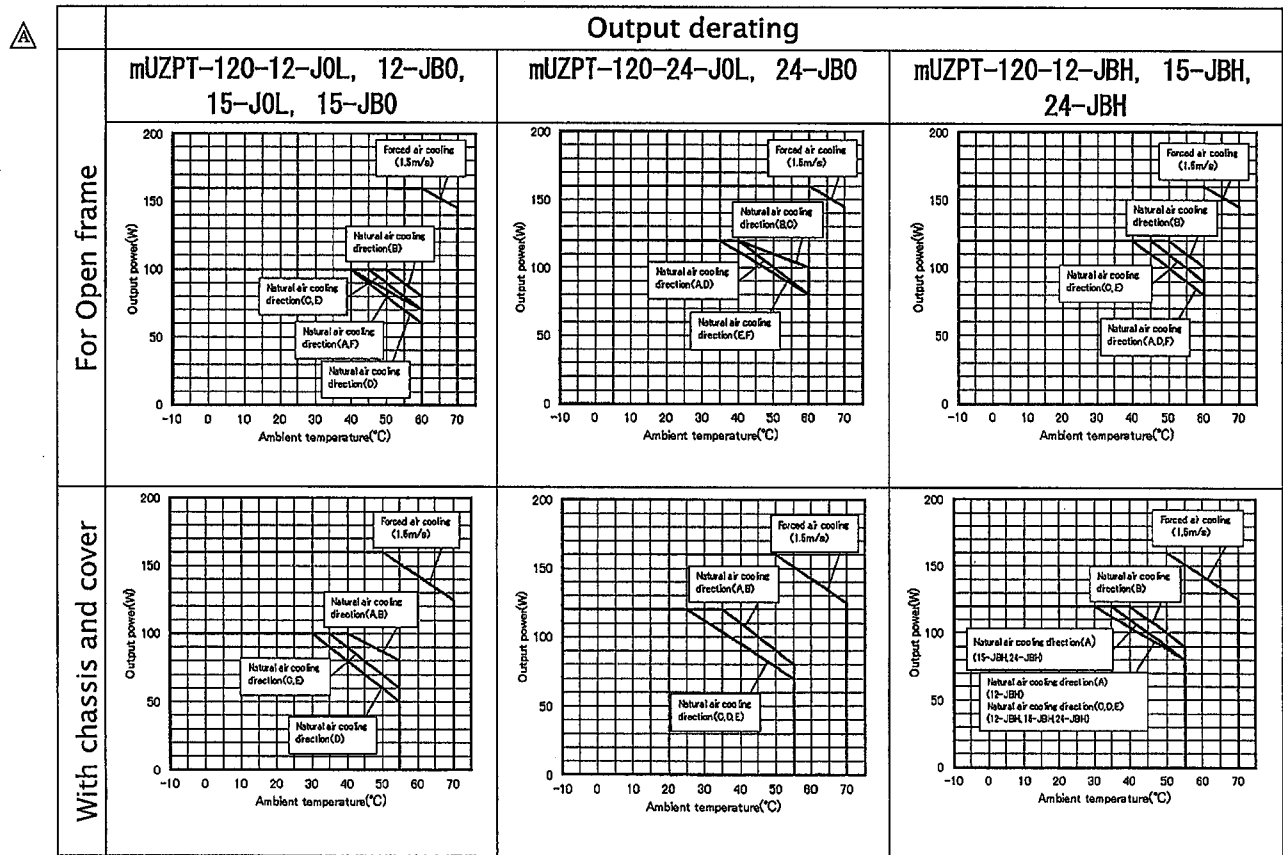
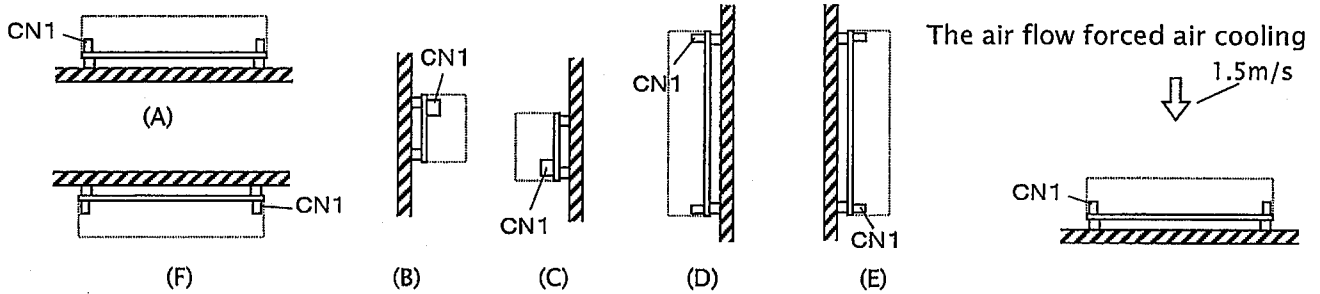


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●Output Derating Based on Ambient Temperature, Installation Direction and Cooling Condition

Follow the derating diagram below for output according to the ambient temperature and installation direction.

In case of using the type with chassis and cover, input voltage range shall be 90VAC or higher, and shall not use in direction (F). Also, forced air cooling condition in the diagram shall be provided that the air flow 1.5m/s is applied from the direction shown below.

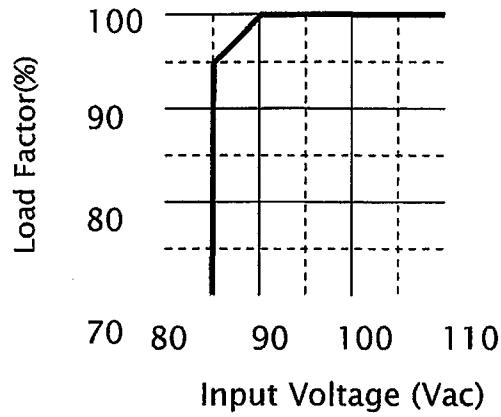


△×2:2020.04.10 M.Okudaira I-320414

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●Output Derating vs. Input Voltage

When input voltage is 90VAC or lower, follow the derating diagram below to reduce the continuous rated current and power.



Note

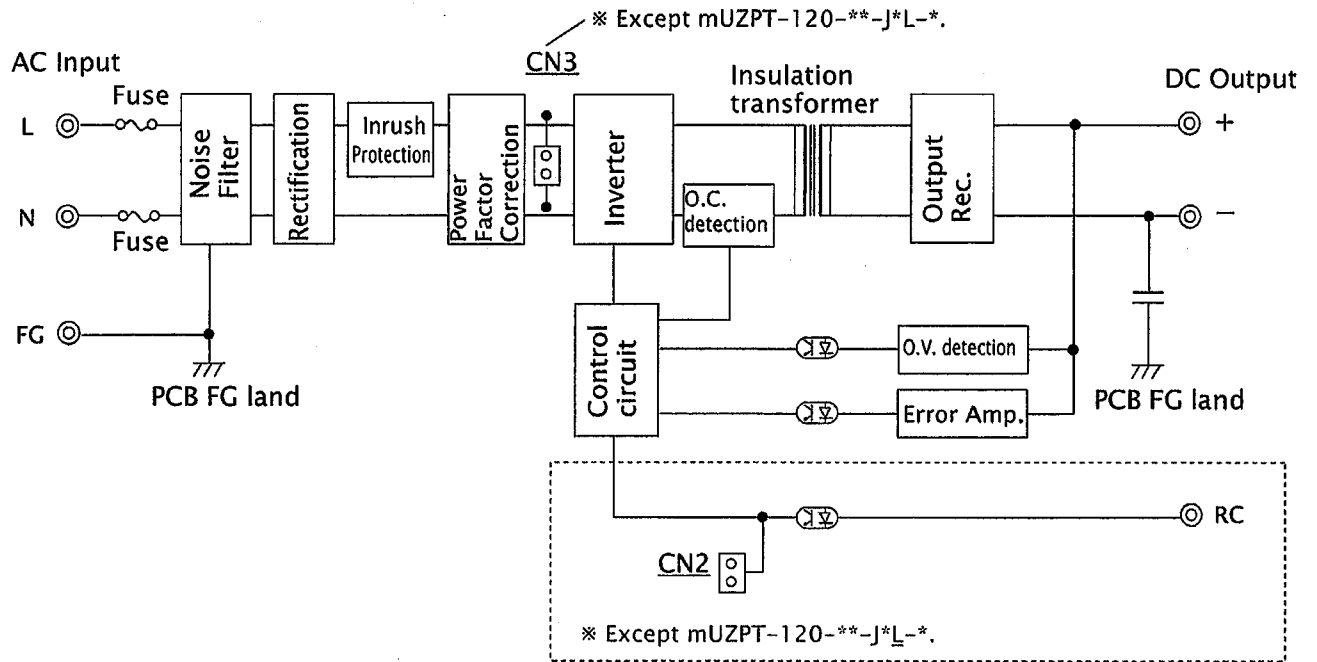


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Due to the technical improvement, the specifications and functions are subject to change without notice.

●Circuit Block Diagram



Note



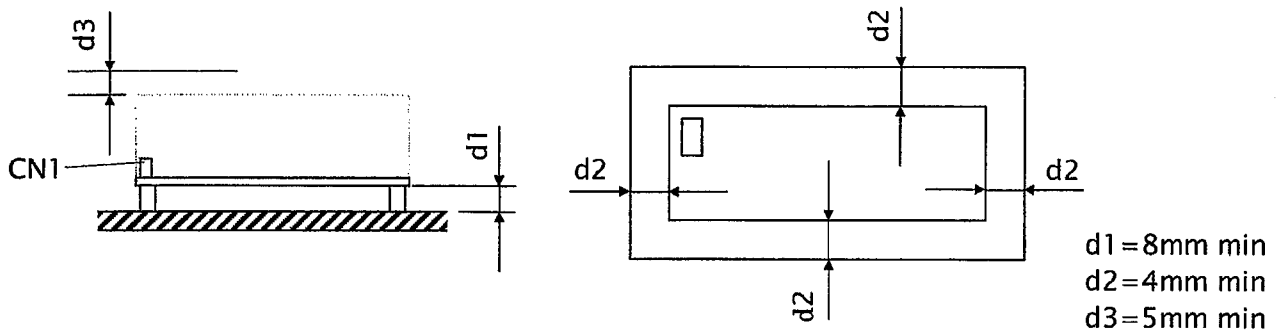
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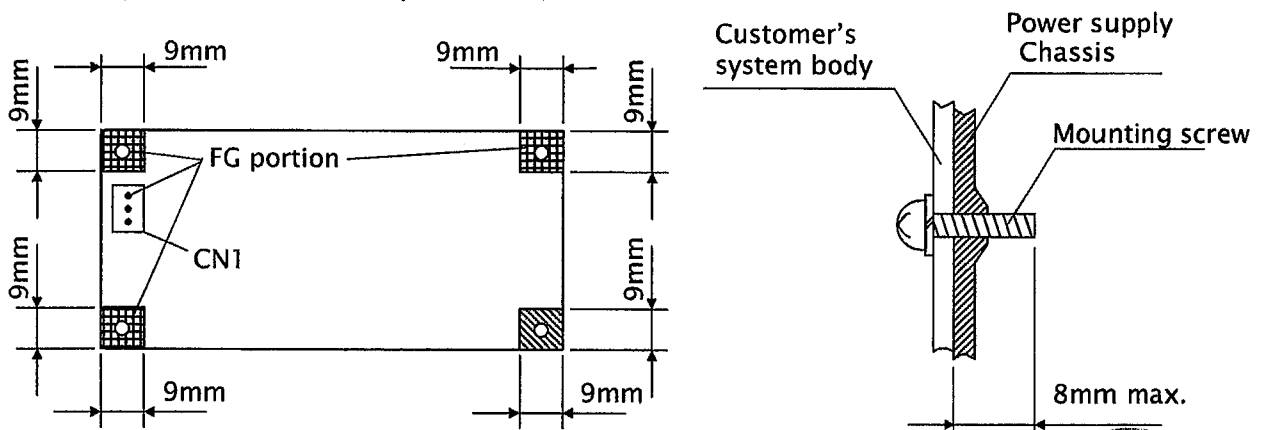
● Power Supply Installation

- To meet standard of insulation and dielectric withstanding, install the power supply to keep the dimensions, d1, d2 and d3, shown in the drawing below.
- Install the power supply so that natural air convection and air ventilation are expected to keep the temperature rise around the power supply low.

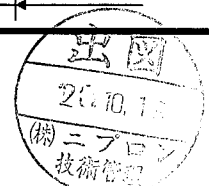


● Mounting Screws and Grounding of Power Supply

- Fix 4 screws firmly at power supply mounting holes.
- Use 3mm diameter screws for mounting power supply.
- Do not use the metal mounting parts that exceed the hatched area shown below.
- In mounting the unit with chassis and cover, do not use any screws that exceed the dimension shown below.
- Make sure to connect FG terminal of CN1 or FG portion of PCB to customer's safety grounding. Also, make sure to connect FG terminal of CN1 to the safety ground of the customer's system in the case of safety standard application.
- Be recommended to connect the FG portion of solder face of PCB to customer's metal system body with metal parts such as metal spacers to reduce noise.



Note



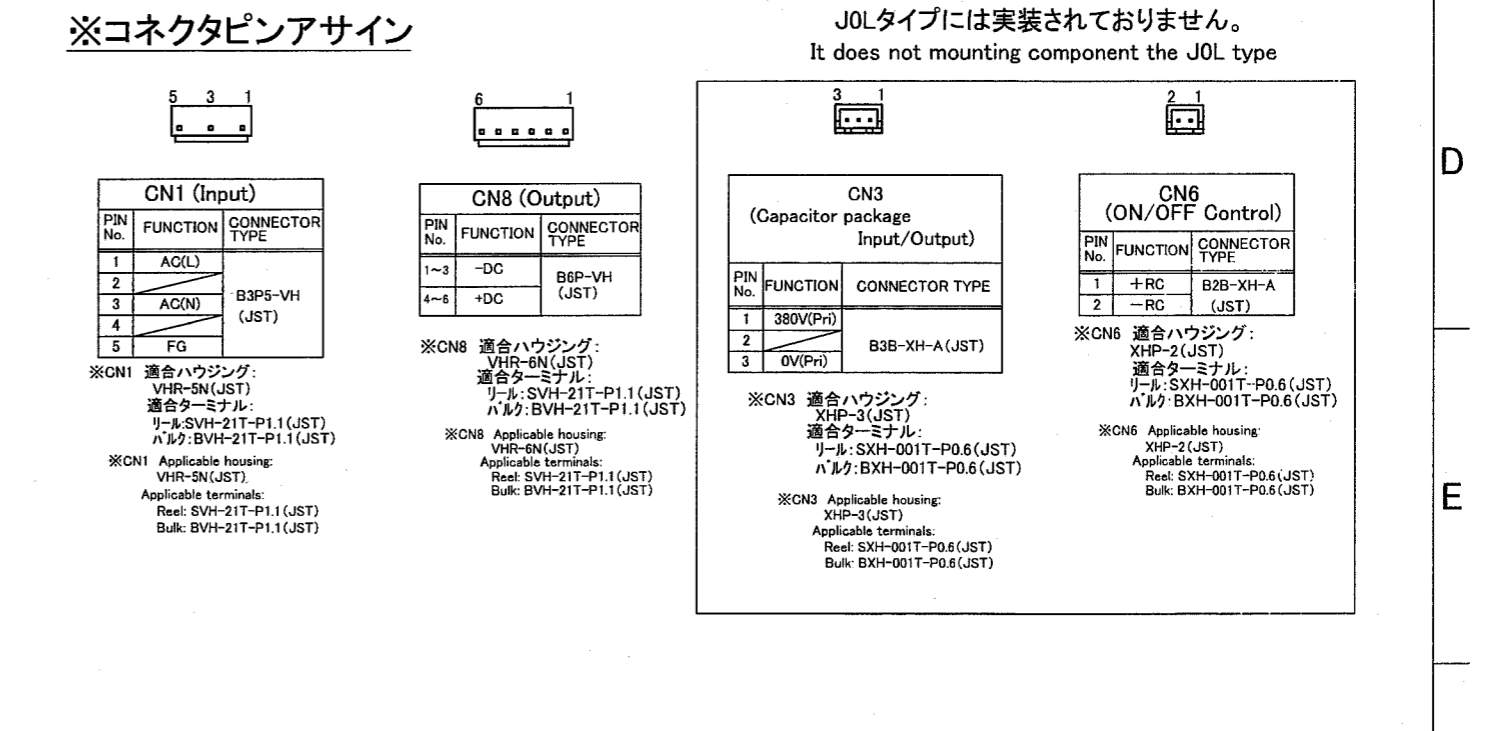
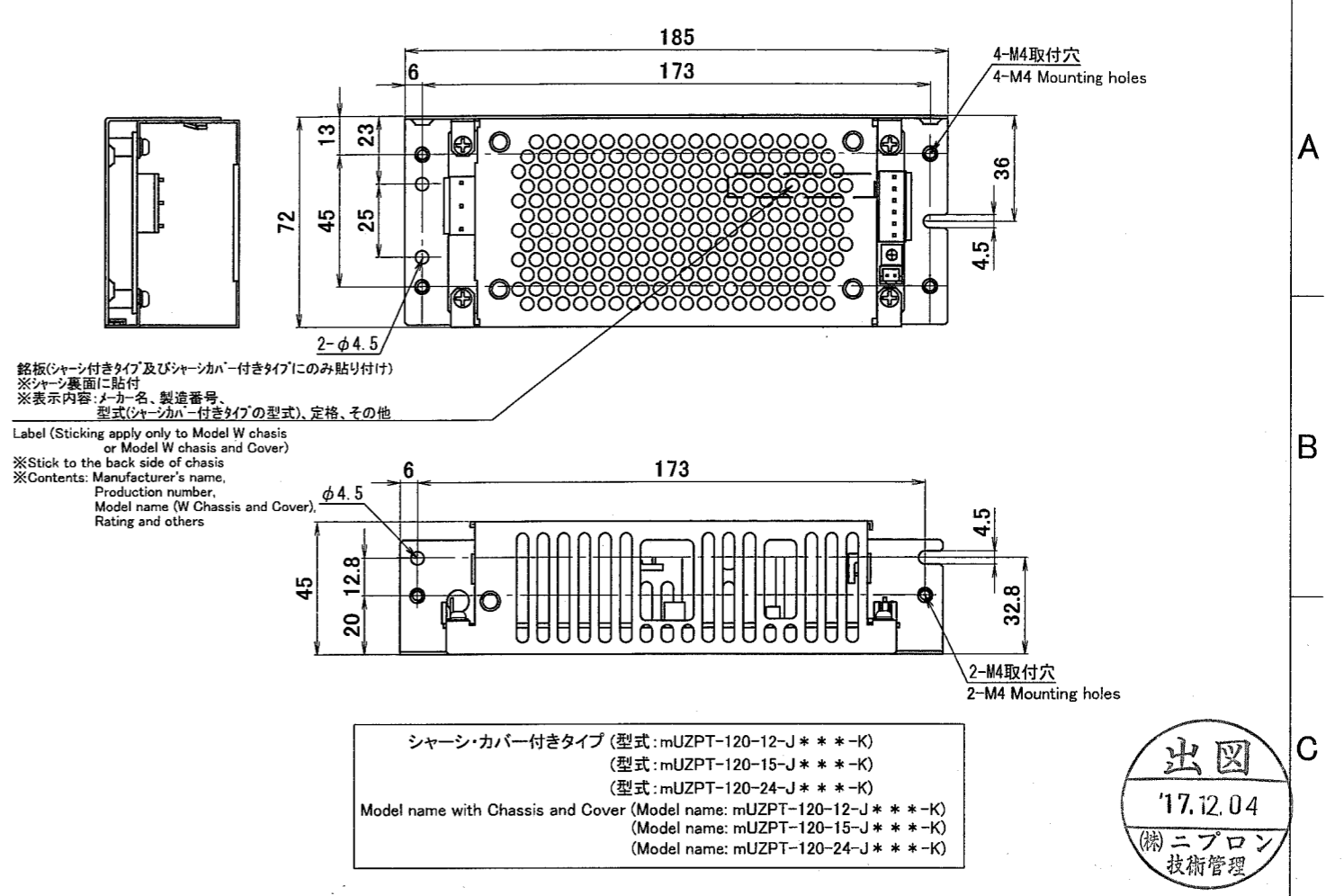
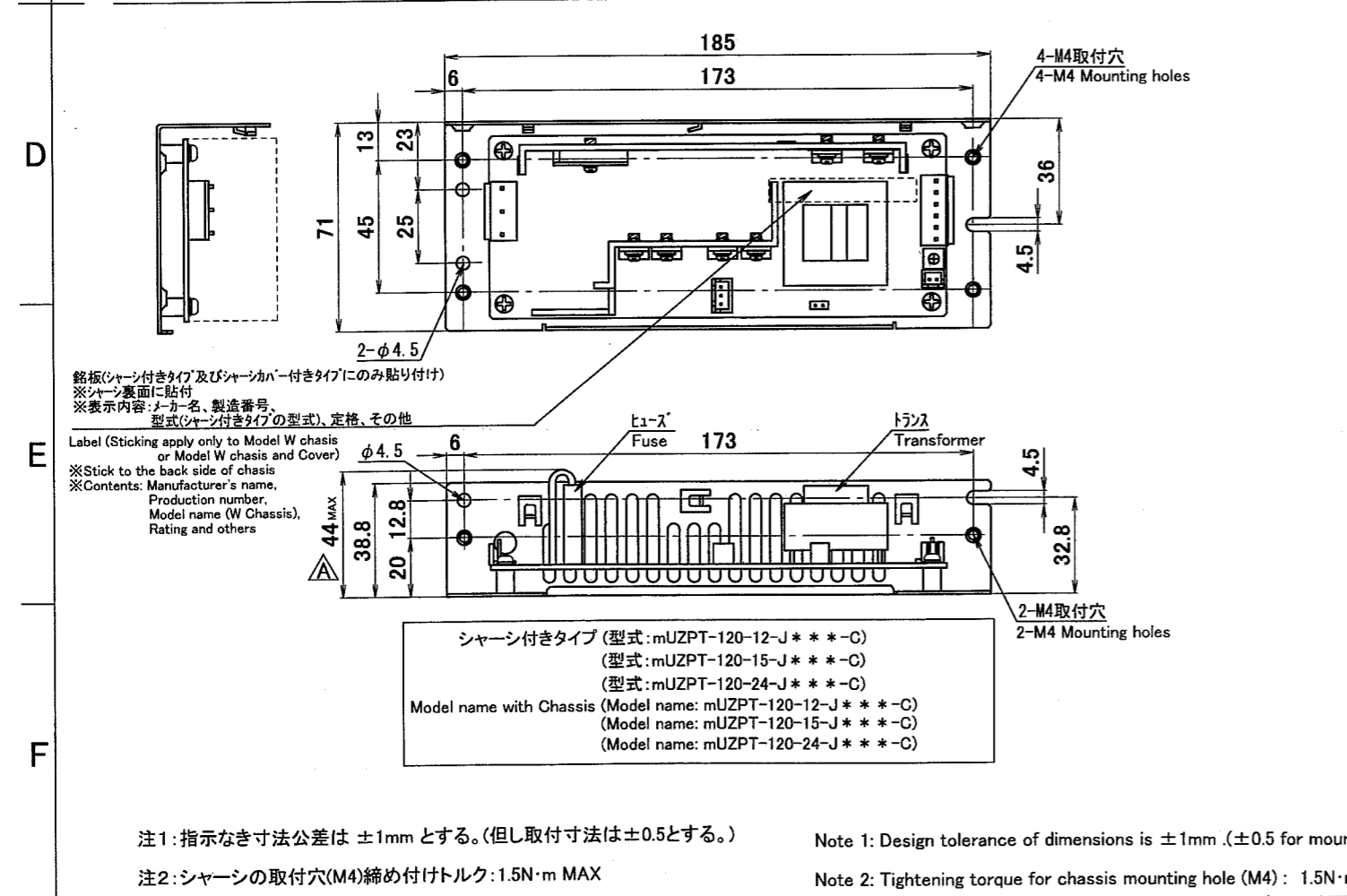
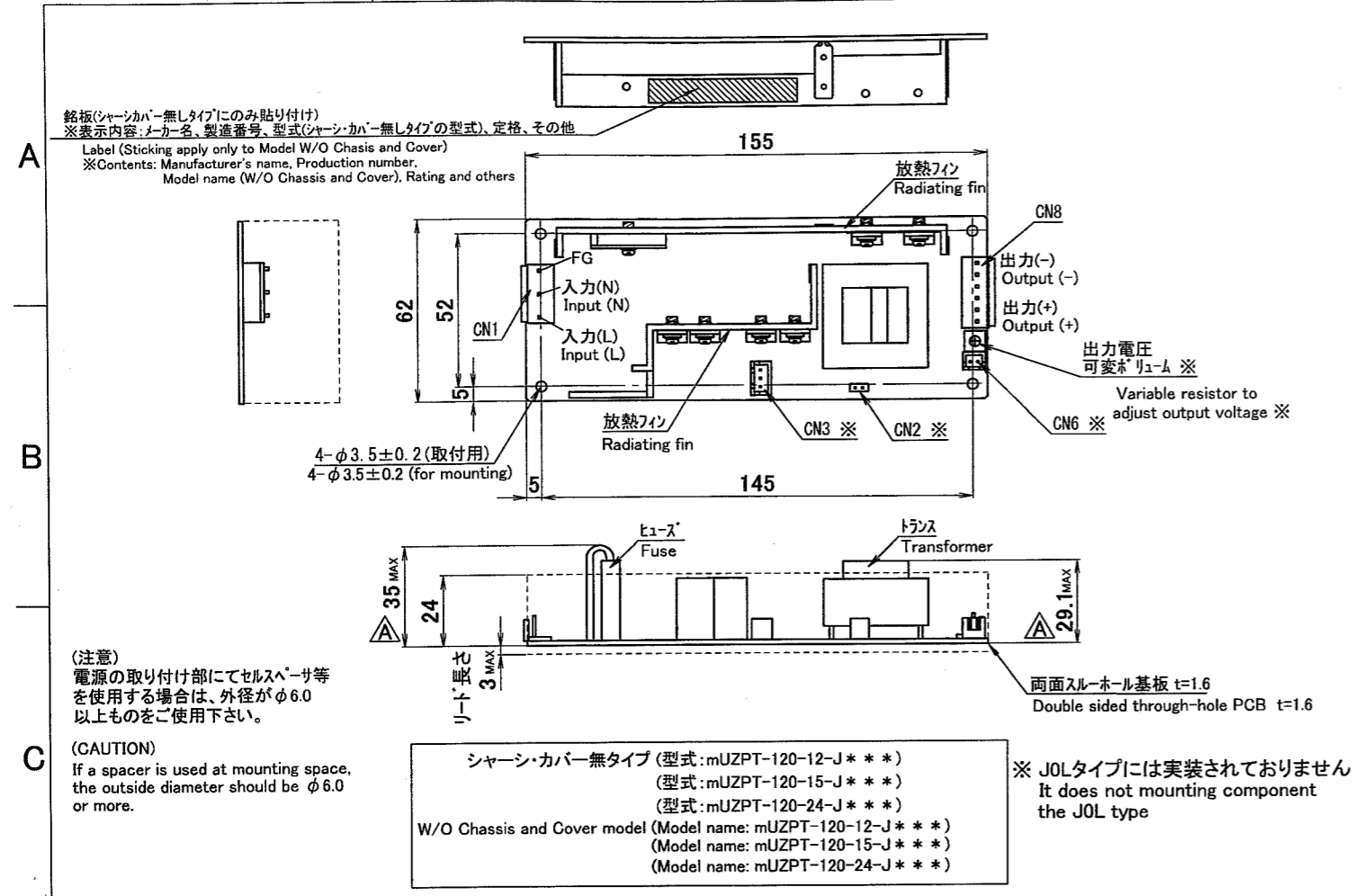
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Precautions before use

1. Grounding ⚠ Warning
 This unit is designed and produced to meet Class I equipment. Make sure to connect the grounding terminal of the unit to grounding in a proper way for safety.
2. Electric shock ⚠ Warning
 This unit is designed and produced as built-in equipment and high-voltage part inside. Make sure to securely install in the equipment in a proper way to prevent electric shock. Also, shorting plug (CN2) for RC signal setting is primary circuit components. When the plug is handled, make sure to turn off AC input before the handling of the plug.
3. Residual voltage ⚠ Warning
 After the shutdown of input voltage, this power supply requires around 1 min. 20 sec. for the lowering residual voltage to 60V due to the high residual voltage in the electrolytic capacitor (C51, C14) at the primary side. Pay attention not to touch to high voltage part at this time as it may cause the electric shock.
4. PCB handling ⚠ Caution
 In handling, use the edge of the PCB so as not to touch the component sides. Lift the PCB from the equipment with filter pieces in installation. Besides, handle the PCB with care to prevent twisting or bending of the PCB board as it has SMT components on it.
5. Output short circuit ⚠ Caution
 Prevent shorting outputs. When output is shorted, capacitors inside the power supply rapidly discharge leading to fire and/or spark resulting in serious accident. It also shortens the lifetime of the power supply.
6. Inrush current control circuit ⚠ Caution
 To prevent inrush current into rectifying capacitors when AC input is turned on, a power thermistor is used. Make sure to careful when AC input is turned on short period, increasing inrush current may occur.
7. Output energy ⚠ Caution
 The output energy of this unit is 240VA or more, and regarded dangerous. Any operators must not touch the unit. Besides, apply necessary measures to prevent service personnel or service tools to touch accidentally the equipment with this unit installed. Make sure that the output voltage of this unit goes down to the safe level before servicing after the input voltage is turned off.



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A版 △×3:2017.11.28 奥平(麻) I-291137

DRAWN BY	CHECKED BY	CHECKED BY	APPROVED BY	SCALE	MATERIALS	TITLE	DRAWING NO.
奥平(麻)	石橋	山田	山本	UNITS	FINISH		
ISSUED	2016.01.13	3RD ANGLE PROJECTION				mUZPT-120	3507-01-3-050 A

注1: 指示なき寸法公差は ±1mm とする。(但し取付寸法は ±0.5とする。)
 注2: シャーシの取付穴(M4)締め付けトルク: 1.5N・m MAX

Note 1: Design tolerance of dimensions is ±1mm (±0.5 for mounting dimension).
 Note 2: Tightening torque for chassis mounting hole (M4): 1.5N・m MAX