



MHAA-100W-D

(incl. optional MHAA-100W-D-SC/SO)

100W Halogen Light Sources INSTRUCTION MANUAL

Please read this instruction manual carefully, before starting operation.

Please carefully read the following information before using the unit. Following warning markings on the light source unit are explained in this instruction manual. The operator has to understand fully the meanings of the markings and the risks indicated through the markings, before starting operation.

 CAUTION	This warning marking indicates a condition that can result in hazard to the operator or damage to the unit.
 HOT	This warning marking indicates a hot surface, which can lead to burnings to the operator.

Precautions for use (CAUTION)



 CAUTION	<ul style="list-style-type: none"> ● The unit may be damaged if the equipment is used in a manner not specified in the instruction manual. ● Do not connect the unit to an input voltage outside the specified voltage ranges of AC100-120 V or AC200-240 V respectively. ● When the lamp is ON, be careful to protect the unit from vibration and hard impacts. ● When the lamp is ON, do not leave <u>flammable materials or liquids</u> around the unit. ● When the lamp is ON, confirm that the <u>cooling fan is working and the air inlets are free and open.</u> ● Before replacing the lamp, <u>read carefully page 16 of this instruction manual: "Replacing the Lamp".</u> ● Before opening the lamp housing cover, <u>be sure to switch the unit OFF and confirm that the fan has stopped.</u> ● <u>Do not look directly at the light source</u> when it is ON. The high density-light can damage your eyes.
 HOT	<ul style="list-style-type: none"> ● Never touch the light guide connector, the ferrule and the upper part of the unit when the lamp is ON or short time after turning OFF. You might get burned as the lamp operates extremely hot.

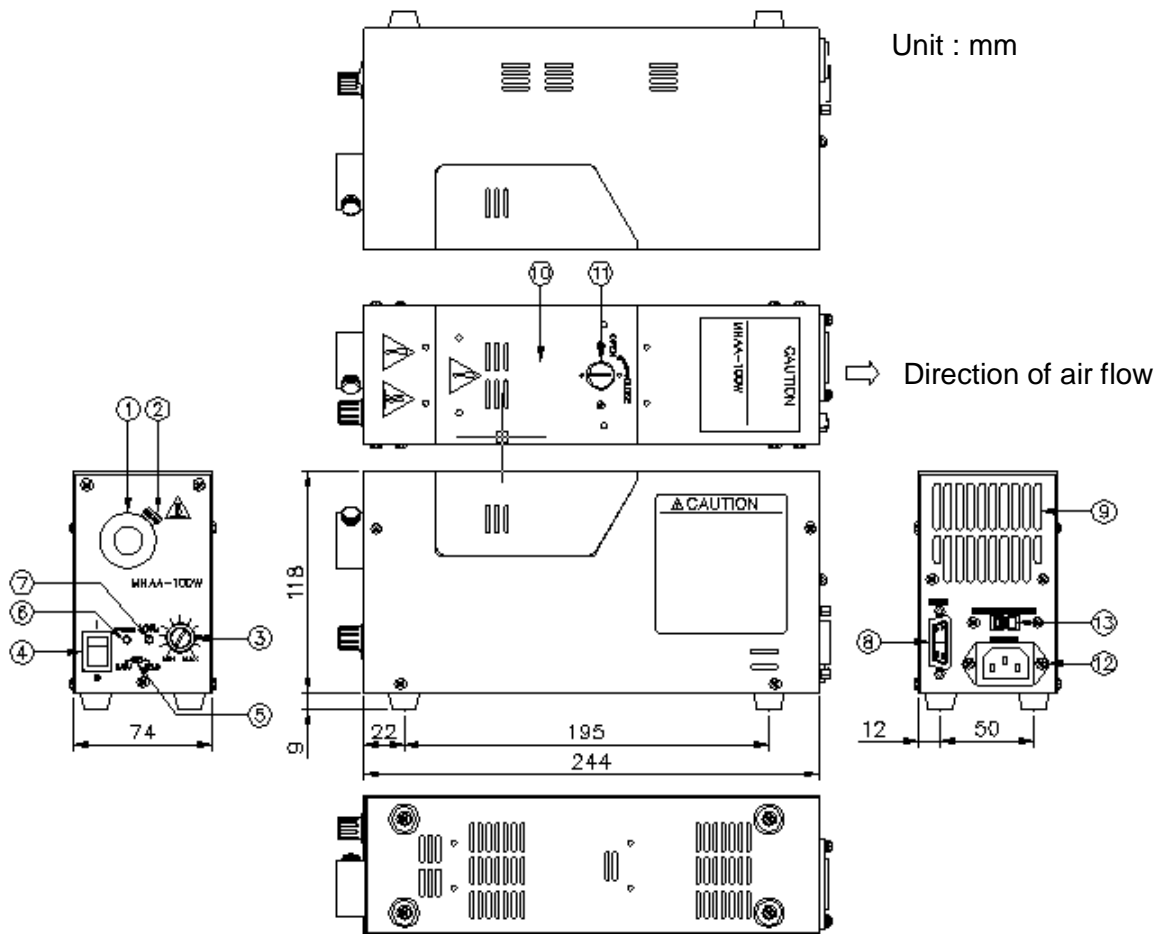
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Statement to intended use of the equipment

This unit is designed for use as a light source for fiber illumination.

Name and Function of Each Part



Unit : mm

Direction of air flow

- ① **Light guide connector:**
Connection to the optical fiber light guide.
- ② **Light guide ferrule fixing screw:**
Turn this knurled screw to fasten the light guide ferrule.
- ③ **Intensity control:**
For adjusting the light intensity.
- ④ **Power switch:**
ON/OFF. If the power switch is OFF, no hazardous voltage parts are touchable when opening the lamp room door for replacing the lamp. Before opening the lamp room door, read carefully page 16 of this manual (Replacing the lamp).
- ⑤ **MANU / REMO selector switch:**
Using this switch, you can chose if the light intensity is adjusted manually or by an external signal. Select REMO for controlling the light intensity by an external signal. Select MANU for controlling it manually.
- ⑥ **Power indicator:**
The light is ON when the power switch is ON.
- ⑦ **Lamp alarm indicator:**
The light is ON when the lamp is blown, or in case of any other abnormality.
- ⑧ **External signal connector (D-SUB):**
Connector for the REMO signal and the alarm signal. Be careful to switch the MANU / REMO switch to REMO if you want to use the connector for REMO signal.
- ⑨ **Cooling fan:**
Be careful to keep at least 50mm of space to the rear of the equipment for adequate ventilation.
- ⑩ **Lamp room (box) door:**
Only open this cover when replacing the lamp. Read page 16 of the instruction manual "Replacing the lamp" carefully.
- ⑪ **Latch for lamp room door:**
Turn this latch to "OPEN", for opening the lamp room (box) door (⑩).
- ⑫ **AC power supply inlet:**
Connection to the AC power supply via power supply cord.
- ⑬ **Voltage selection switch**
Switch for selecting the equipment supply voltage range (AC100/200)
 - ※【 115 】 switch indication : Use it with AC100-120V.
 - ※【 230 】 switch indication : Use it with AC200-240V.
 - ※In case the input voltage setting different from the initial setting is selected, use AC cable complying the regulations and standards of the country where the unit will be used.
 - ※Use the cable specifications conforming to the following conditions.
 - Three-wire (L, N and PE) cable with the length of 3m or less, and Class I Type main power code plug.
 - The cable with the voltage, current and temperature range conforming to the specifications of the Light Source Unit.

Features

- **Manual adjustment function of light intensity**

The light intensity can be adjusted from 0 to MAX, by turning the light intensity control (3) on the front panel of the unit. This function is only activated, if the MANU / REMO selector switch (5) on the front panel of the unit is set to MANU.

- **Adjustment of the light intensity by remote control**

The light intensity can be adjusted from 0 to MAX, by inputting the relevant Bit sequence at the external signal connector on the rear panel of the unit (Pins 1-8). This function is only activated, if the MANU / REMO selector switch (5) on the front panel of the unit is set to REMO. See page 14-15 for detailed description of the external signal connector.

- **Lamp ON/OFF function**

The lamp can be turned ON / OFF by an external signal. When connecting a DC5V-24V signal to the external signal connector (8) the lamp turns OFF, regardless of the MANU / REMO setting. See page 14-15 for detailed description of the external signal connector.

- **Detection of lamp-overcurrent ***

(Monitor available as option.)

This function detects an overcurrent through the lamp and shuts down the power to the lamp, if this overcurrent flows continuously. Additionally, Pin

12 of the external signal connector (open circuit in normal condition) is internally short-circuited to COMMON (Interface to user).

- **Detection of internal temperature rise ***

(Monitor available as option.)

This function detects an abnormal temperature rise in the vicinity of the lamp, and shuts down the power to the lamp. Additionally, Pin 13 of the external signal connector (open circuit in normal condition) is internally short-circuited to COMMON (Interface to user).

- **Monitoring function for abnormal lamp-state ***


This function sets a signal in case of an abnormal lamp-state, for example if the lamp goes open circuit. This signal is put out at the external signal connector (8) at the rear panel of the unit. (Pin 11 of the external signal connector (open circuit in normal condition) is internally short-circuited to COMMON). The power to the lamp is not shut down.

- **Shutter function (option)**

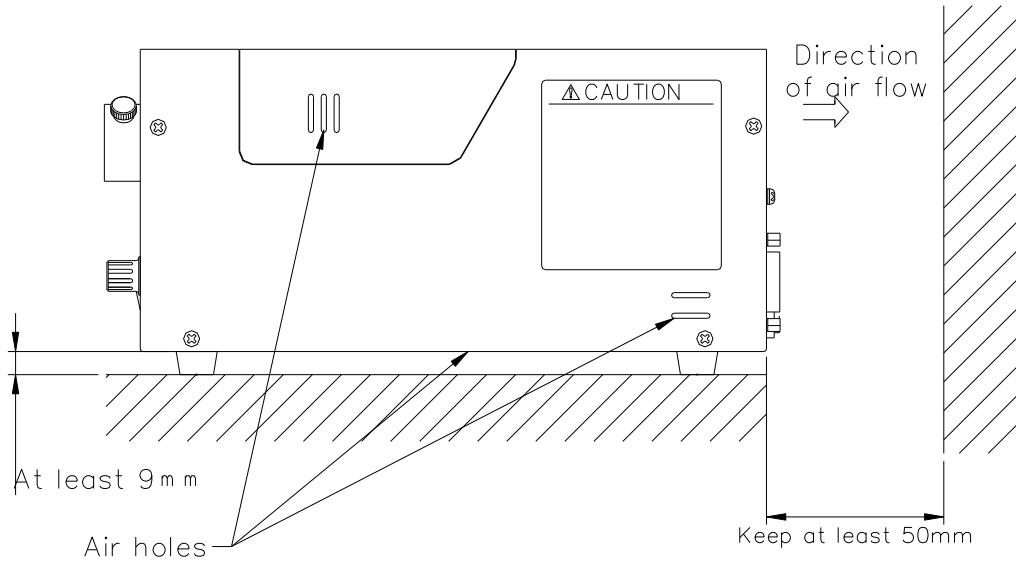
The (optional) shutter function (MHAA-100W-DSC/DSO) does operate when a DC24V signal is connected to the Shutter ON/OFF input of the external signal connector. This function does operate regardless of the MANU / REMO setting.

(*) indicates that the unit will stop operating. For resetting the unit, switch it OFF, wait for 3 seconds and then switch it ON again.

Installation Method

 <p>Caution</p>	<ul style="list-style-type: none"> ● The power plug breaks the mains supply to the unit. Be sure to connect the plug in such a way that it can be pulled out easily, in case of emergency. ● Provide adequate space for ventilation because otherwise the light source may malfunction or cause fire.
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Install the unit in such a way, that adequate space is left free for ventilation.



※ Horizontal installation with the rubber feet of the unit at the bottom

Install the unit at a horizontal place and secure enough peripheral space for ventilation.

※ Optimum Space


Direction of air flow:	Keep at least	50 mm
Air holes at top of unit:	Keep at least	30 mm
Air holes at side of unit:	Keep at least	10 mm
Air holes at bottom of unit:	Keep at least	9 mm

※ Install the unit at such a place where the power switch can be easily turned on or off, or where the inlet or the plug can be easily removed.

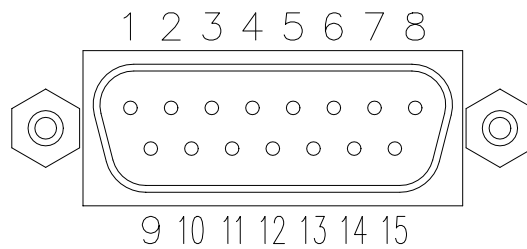
※ Protection from electric shock: Class I Equipment (IEC 60950-1)

※ Always connect the unit to ground before use.

External Signal Connector

 <p>Caution</p>	<ul style="list-style-type: none"> ● Only SELV circuits, which have reinforced insulation to their equipment primary circuit may be connected to the external signal connector. (SELV according to EN60950-1) ● Be careful not to apply an excessively large input or load to the connection pins, because otherwise the light source might get damaged. ● Use a shielded cable with a length not exceeding 2m for external connection. ● Make sure that the panel VR and the external inputs are at their minimum settings when the light source unit is ON. This extends lamp life and prevents deterioration of the lamp performance.
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■ Interface Specifications



Pin No.	Function	Pin No.	Function
1	Bit 1 (LSB)	9	COMMON (+) input ^{※1※2}
2	Bit 2	10	Lamp ON/OFF signal input
3	Bit 3	11	Lamp off signal (Open Emitter)
4	Bit 4	12	Over current monitor (Open Emitter)
5	Bit 5	13	Abnormal temperature signal (Open Emitter)
6	Bit 6	14	Shutter ON/OFF input ^{※3} (DC24V)
7	Bit 7	15	Shutter ON/OFF input ^{※3} (GND)
8	Bit 8 (MSB)		

- ※ 1 Supply 5 Vdc – 24 Vdc to this pin
- ※ 2 Do not change the input voltage during use
- ※ 3 Option

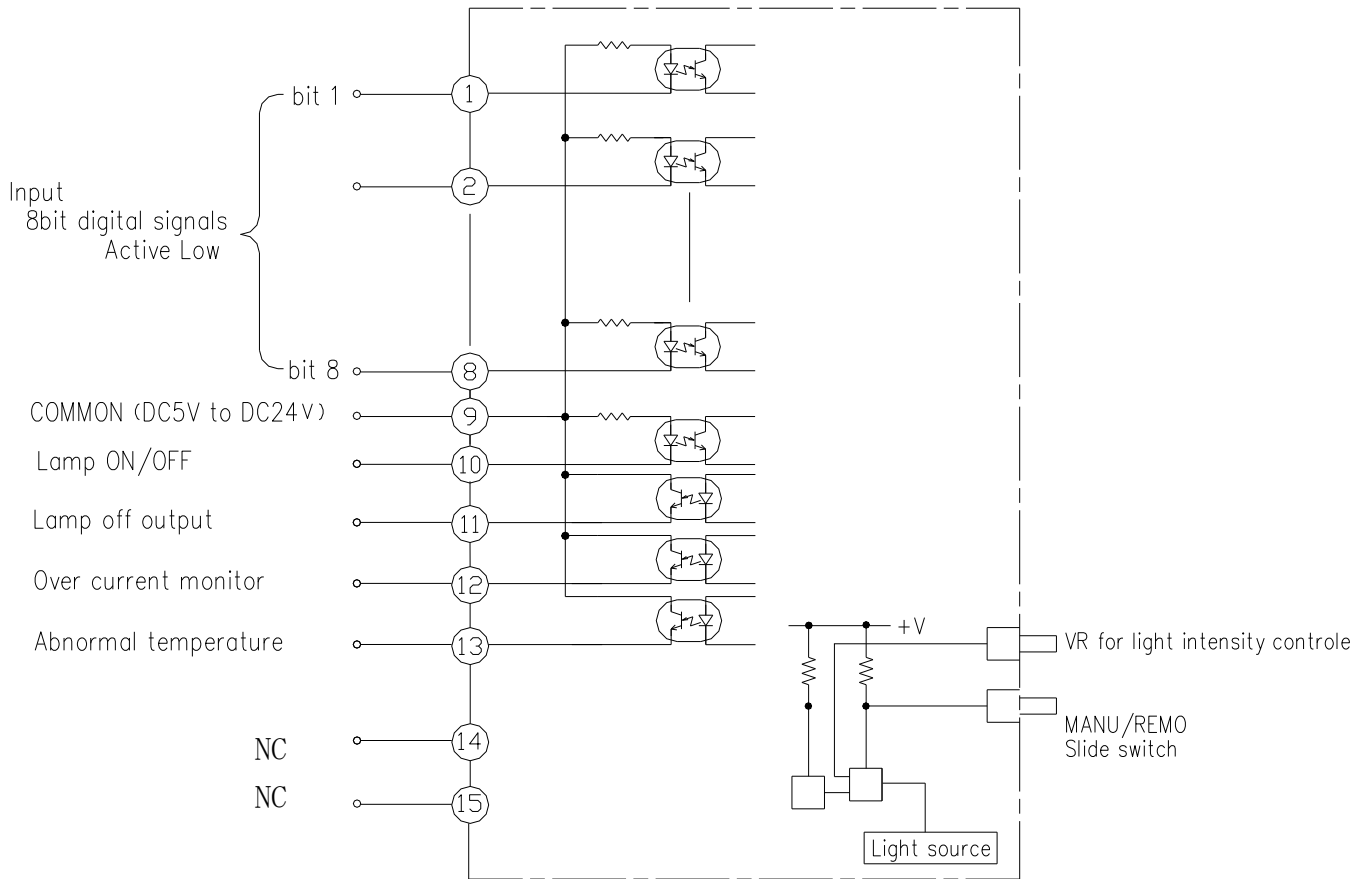
■ External Cable (side) connector

When controlling the light intensity of the lamp by external signal, only use connector types, which are indicated on below.

- Connector (female): HDAB-15S (made by HRS) or equivalent
- Connector case: HDA-CTH (made by HRS) or equivalent

■ How to use the remote control function

For controlling the light intensity of the lamp by external signal, please follow the instructions as shown below.



Following kinds of controls are possible when connecting like shown above. Use the MANU / REMO switch on the front panel of the unit.

MANU: Adjust the light intensity by using the panel VR.

REMO: Adjust the light intensity by external signal, connected to the external signal connector at the rear panel of the unit. (D-SUB 15P)



Truth table (input and output signals)

Output			External signals									Lamp Status
Lamp OFF	Over current	Abnorm Temp.	Lamp ON/OFF	bit 8	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	
0	0	0	0	x	x	x	x	x	x	x	x	OFF
1	0	0	x	x	x	x	x	x	x	x	x	OFF Abnormal lamp state
0	1	0	x	x	x	x	x	x	x	x	x	OFF lamp overcurrent
0	0	1	1	x	x	x	x	x	x	x	x	OFF Abnormal Temp. Rise
0	0	0	1	0	0	0	0	0	0	0	0	ON, min. light intensity ↓ max. light intensity
0	0	0	1	0	0	0	0	0	0	0	1	
0	0	0	1	0	0	0	0	0	0	1	0	
0	0	0	1	0	0	0	0	0	0	1	1	
0	0	0	1	1	1	1	1	1	1	1	0	1
0	0	0	1	1	1	1	1	1	1	1	1	0
0	0	0	1	1	1	1	1	1	1	1	1	1

Input 1 : Input High (COMMON) or Input open
 0 : Input Low
 Output 1 : Short to COMMON (Photo-coupler ON)
 0 : Output Open (Photo-coupler OFF)
 x : H · L free

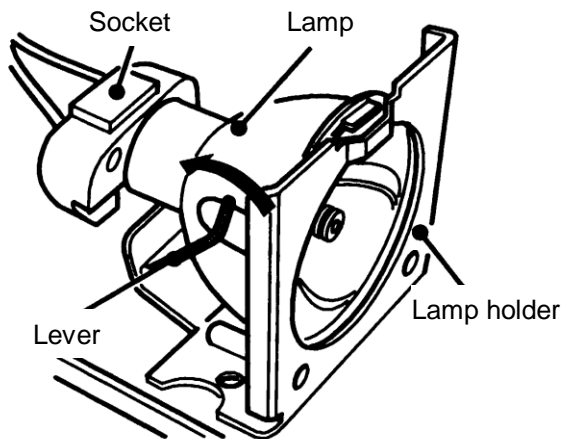
Replacing the Lamp

If the lamp is blown, replace it only with the same type of lamp.

 <p>HOT</p>	<ul style="list-style-type: none"> ● Before replacing the lamp, be sure that the lamp is OFF and the power switch is ON for at least 10 minutes before replacing the lamp. The lamp is very hot, and touching it before it has cooled down sufficiently can cause you burns.
 <p>CAUTION</p>	<ul style="list-style-type: none"> ● Before opening the lamp room door, be sure to switch the unit OFF (power switch) and confirm that the fan stops. Never turn ON the power switch when the lamp room door is opened. Danger of electric shock, burns and injury due to moving fan. ● Confirm to use the specified lamp (LM-100) before replacement, because otherwise the fiber characteristics will change to the worse. ● Be careful not to drop the lamp when replacing it. ● Never touch the lamp bulb with bare hands. Even small amounts of grease or other impurities can cause failure of the lamp as it heats up.

1 Turn the latch of the lamp room door to “OPEN”, then open the lamp housing cover.

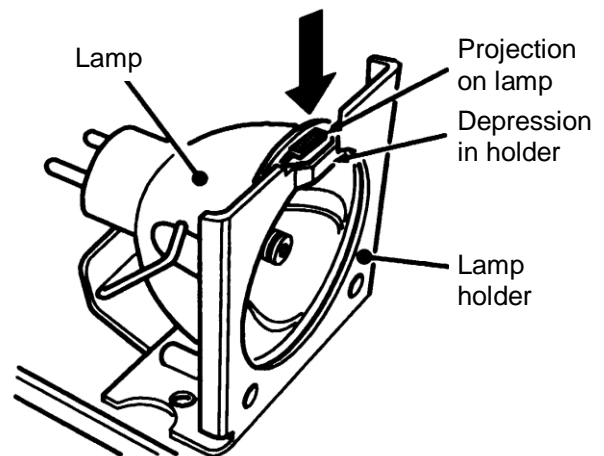
2 Gently pull the lever following the arrow to slide the lamp fixed in the lamp holder.



3 Carefully remove the blown lamp from the holder.

4 Pull out the lamp from the socket.

5 Carefully slide the new lamp down into the lamp holder and set the lever to the original position. Before fixing the lamp, ensure that the projection on lamp coincides with the depression in holder.



6 Keep pushing the socket to the lamp until it fixes in firmly.

7 Return the lamp room door to its original position, and then turn the latch to “CLOSE”.

NOTE:
 When the lamp socket becomes old, the contact resistance increases and the light intensity may get reduced. For this reason, the lamp socket should be replaced at regular intervals. Have this work be done by the shop where you purchased the unit or by the nearest MORITEX sales office.

Option

1. MHAA-100W-SC/SO

There are two kinds of shutters, which have following states, when the signal at the external signal connector is LOW.

SO type ····· Shutter Open, the light projection is not shut.

SC type ····· Shutter Close, the light projection is shut.

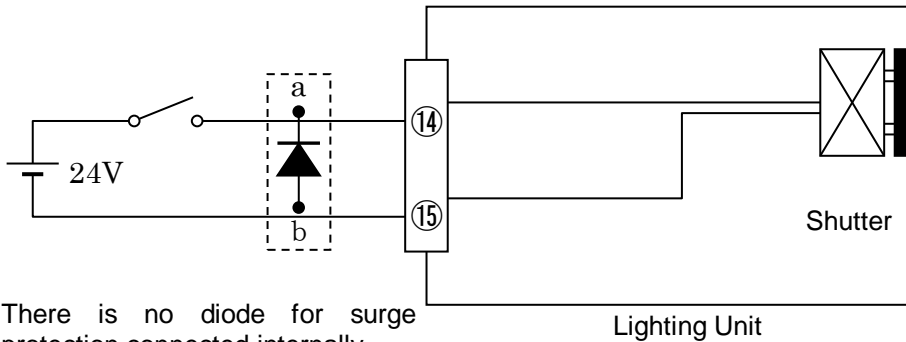
※ Please read the following information after confirming the type of the shutter (SO or SC).

2. Shutter operation

The optional shutter is operated by putting in a voltage of 24V/0V to the Shutter ON/OFF input of the external signal connector.

Input voltage	0 V(OFF)	24 V(ON)
SO type	Open	Close
SC type	Close	Open

3. Connection example



There is no diode for surge protection connected internally. For connecting an external diode, please refer to the schematic above and to diode specifications below.

Connection example

■ Diode specifications (example)

- Diode: D1N60 (made by SHINDENGEN) or equivalent

Reverse Voltage: 600 V

Forward Voltage: MAX 1.05 V

Reverse Current: MAX 10 μ A

Forward Current: 1 A

4. Specifications

4.1. Interface specifications (External Signal Connector)

Pin number	Name
14	Shutter ON/OFF signal (+24 V)
15	Shutter ON/OFF signal (GND)

4. 2. Shutter specifications

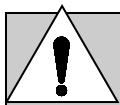
Opening and closing method		Mechanical type (rotary solenoid)	
Standard voltage / current		DC 24 V / 0.32 A (typ.)	
Operating temperature / humidity		0-40 °C / 20-80 % RH	
Lifetime		50.000.000 times ※1	
Max. continuous operation		1 hour (at 20 °C) ※2	
Response time		SO	SC
ON time	25 ms (max.)	open→close	close→open
OFF time	30 ms (max.)	close→open	open→close

The shutter response time becomes longer (the shutter speed becomes slower) when the diode for surge protection is installed.

Response time with diode connection (reference value)		SO	SC
ON time	30 ms	open→close	close→open
OFF time	45 ms	close→open	open→close

※1. Average lifetime (according to our experience)

※2. Please turn OFF the shutter for about 10 minutes after the shutter is continuously ON for an hour.



Caution

- Please do not input a voltage above 24V because it causes troubles and deteriorations.

Cleaning the equipment

Clean the unit periodically.



Caution

- Before cleaning the unit, be sure to switch OFF the unit and disconnect the optical fiber.
- Do not use anything else than a neutral detergent for cleaning the device. Thinner, benzene and household cleaner may damage the unit.

- If dust accumulates at the air inlet or on the fan, use the crevice nozzle of a vacuum cleaner.
- If the contamination is worse, wipe it off with a cloth that has been lightly immersed in a weak solution of neutral detergent.

Troubleshooting

Before requesting repair, check the following items.

Symptom	Cause	Remedy
The lamp does not switch ON. (Neither lamp nor fan do work.)	<ul style="list-style-type: none"> ● Check the power plug, for correct plug-in. 	<ul style="list-style-type: none"> ● Insert the plug correctly into the power outlet.
The lamp does not light when the unit is switched ON. (The fan does work.)	<ul style="list-style-type: none"> ● The lamp might be blown. ● Check the light intensity control. 	<ul style="list-style-type: none"> ● Replace the lamp according to the instruction manual. ● Rotate the light intensity control to adjust the light intensity.
The light intensity of the lamp does not change.	<ul style="list-style-type: none"> ● Check the MANU / REMO selector switch. 	<ul style="list-style-type: none"> ● The light intensity can be adjusted manually, only if the MANU / REMO selector switch is set to MANU.
The lamp lights only momentarily (about 3 seconds) and then goes out again.	<ul style="list-style-type: none"> ● The lamp may have blown 	<ul style="list-style-type: none"> ● Replace the lamp with a new one. Refer to the instruction manual for the lamp replacing procedure.

Warranty and Service

- The warranty of this product lasts for two years from the date of purchase. In case of product failure within two years from the date of purchase, and there is no doubt on the correct utilization of the product, according to this instruction manual the unit will be repaired at no charge. The lamp is excluded from this service.
- Repairs on the product, later than one year from the date of purchase will be charged. In case of maintenance, the product will be repaired for any defective parts, if the customer requests it. These repairs will be charged.
- Please feel free to contact MORITEX, if anything remains unclear.
If you have any questions regarding parts or service, please contact your dealer or an authorized MORITEX service center.

※ Please provide following information when requesting service.

- Model: MHAA-100W-D
- Manufacturing number: Indicated on the top of the unit.
- Date of purchase:
- Breakdown state: Please provide detailed information
- Your name (company name and/or individual name), address, telephone/FAX number

General Specification

The specifications of this unit may be changed without prior notice.

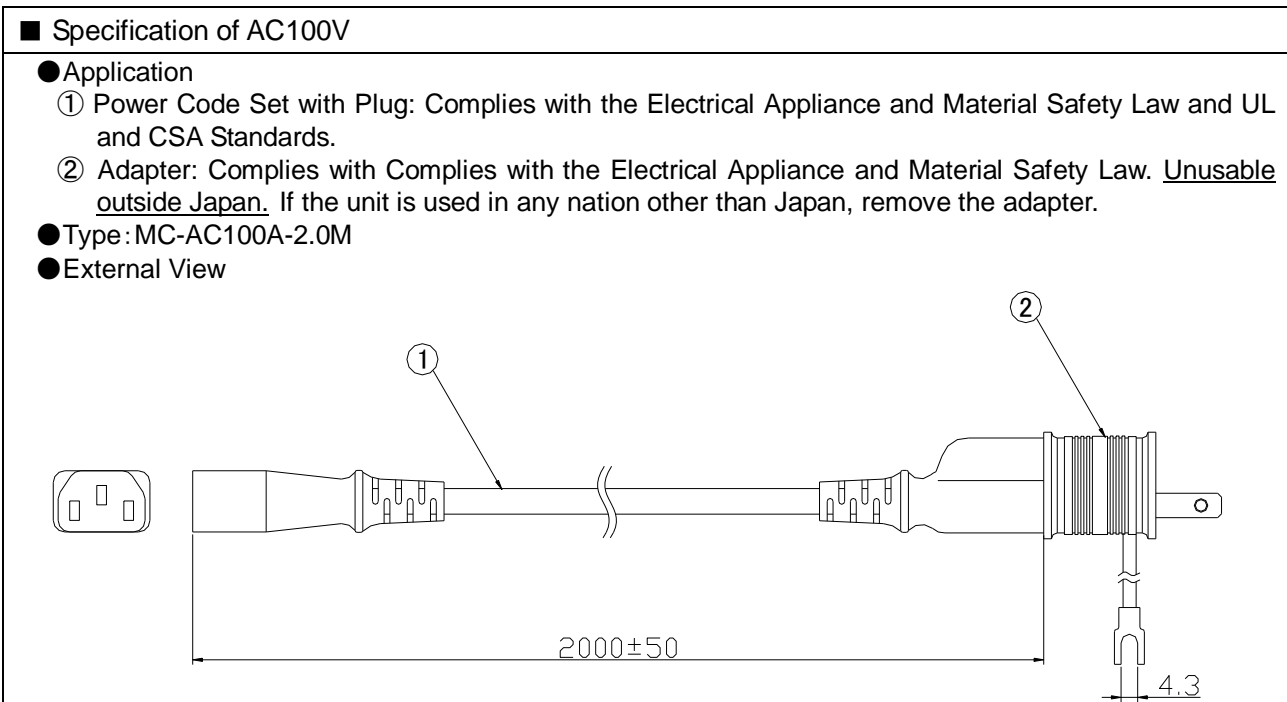
Item	MHAA-100W-D	MHAA-100W-D-SC/SO
Circuit method	PWM regulated switching type	
Input source	AC 100-120V / 200-240V 50/60Hz	
Input voltage range selection ^{※6} (Voltage selector switch on the rear panel)	Voltage selection switch indicates "115": Input Voltage Range: AC 100-120V Voltage selection switch indicates "230": Input Voltage Range: AC 200-240V	
Factory Setting	Specification of AC 100V <ul style="list-style-type: none"> • Input Voltage Selection Switch: "115" is indicated. • AC Cable: MC-AC100A-2.0M Specification of AC 200V <ul style="list-style-type: none"> • Input Voltage Selection Switch: "230" is indicated. • AC Cable: MC-AC200A-2.0M 	
Input current (Typical)	2.4A (in AC 100 V mode) 1.2A (in AC 200 V mode)	
Rush current	Less than 30A (Input Voltage: AC100V, air temperature 25°C, cold start) Less than 69A (Input Voltage: AC230V, air temperature 25°C, cold start)	
Environmental conditions	Indoor use Altitude up to 2000m Temperature 0°C to 45°C Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C Pollution degree 2 Installation category 2	
Operating lamp	Halogen lamp with dichroic reflector LM-100 (12V, 100W)	
Lamp method	DC voltage	
Lamp source (standard)	11.7 Vdc ±0.2V (Max.)	
Lamp life	Normal: 1000 hours (12.0V)	
Illuminance ^{※1}	Approx. 30000 lx	
Color temp. ^{※2}	Approx. 3100 K	
Light intensity method	Variable voltage type	
External light intensity Adjustment function	Yes (8bit digital signal)	
Protection function ^{※3}	Output cutoff: Overload detector, temperature fuse Input cutoff: Overload detector, internal fuse	
Shutter function Option	-	Yes
Cooling method	Forced cooling, using fan (forced air cooling)	
Installation method	Install horizontally on the rubber feet at the bottom of the unit	
Dimensions ^{※4}	74(W) x 118(H) x 244(D) mm	
Weight	Approx. 2kg	
IP code	IP20 (By IEC60529)	
CE Marking ^{※5}	LVD: 2014/35/EU , EMC: 2014/30/EU RoHS: 2011/65/EU, 2015/863	

NOTE:

- ※1 Measured value, 50mm from the edge of the unit. Standard MORITEX light guide is installed; color temperature is at maximum value.
- ※2 Maximum color temperature of the lamp.
- ※3 Output signals to external signal connector.
- ※4 Dimensions do not include the projection part.
- ※5 The MHAA-100W-D, MHAA-100W-D-SC/DSO are CE marked according to the Low Voltage Directive, EMC Directive. The user has to make sure that all external equipment (incl. the power supply cable), connected to this device also do conform to the relevant EU Directives and are adequately tested to applicable, valid EN standards.
- ※6 Be careful to connect the right voltage to the relevant Input Voltage Range determined by the position of the Voltage Selection Switch. If you connect a wrong voltage the equipment might be damaged because of overvoltage or might not work because of undervoltage.
- ※7 In the operating temperature exceeds 40°C, the plastic fiber light guide cannot be used. Even if the temperature is lower than 40°C, the quartz adopter (KA-03) is required depending on the fiber bundle diameter of the light guide. For the details, please contact us.

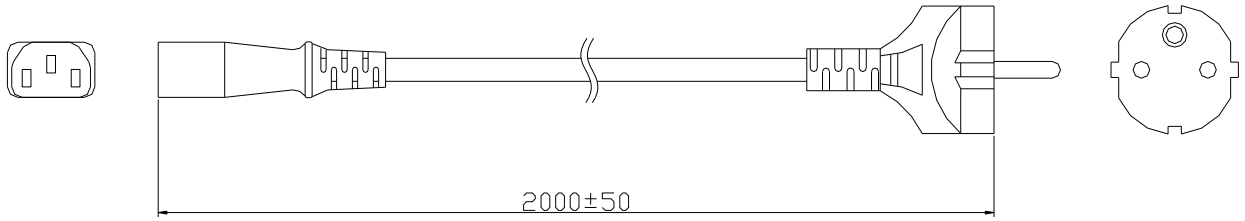
■ Accessories

- Instruction Manual1 (This book)
- AC Code Set1 ※
 - ※ The attached cable varies depending on the input voltage specification.
 - ※ You are requested to confirm the compliance with the standard applicable to a country or region where the unit will be used.
 - ※ An attached AC cord set is an AC cord set for exclusive use of this source of Light Source Unit. Other than this source of Light Source Unit, please do not use it.



■ Specification of AC200V

- Application: Power Code Set with Plug to be used in Europe.
- Note: This power code set with the plug is unusable inside Japan.
- Type: MC-AC200A-2.0M
- External View



お問い合わせは…….

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