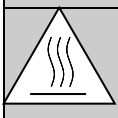# MORITEX
Vision Creating Value

MHAB-150W / MHAB-150W-C

（MHAB-150W-SC/SO,MHAB-150W-C-SC/SO:option）

150W 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.

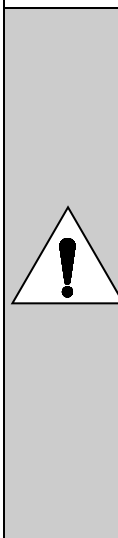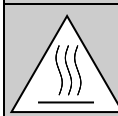## Precautions for use (CAUTION)

| ⚠ CAUTION	●The unit may be damaged if the equipment is used in a manner not specified in the instruction manual. ●When the lamp is ON, be careful to protect the unit from vibration and hard impacts. ●When the lamp is ON, do not leave **flammable materials or liquids** around the unit. ●When the lamp is ON, confirm that the **cooling fan is working and the air inlets are free and open**. ●Before replacing the lamp, **read carefully page 16 of this instruction manual: "Replacing the Lamp".** ●Before opening the lamp housing cover, **be sure to switch the unit OFF and confirm that the fan has stopped**. ●**Do not look directly at the light source** when it is ON. The high density-light can damage your eyes.
⚠ HOT	●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.

Table of contents

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
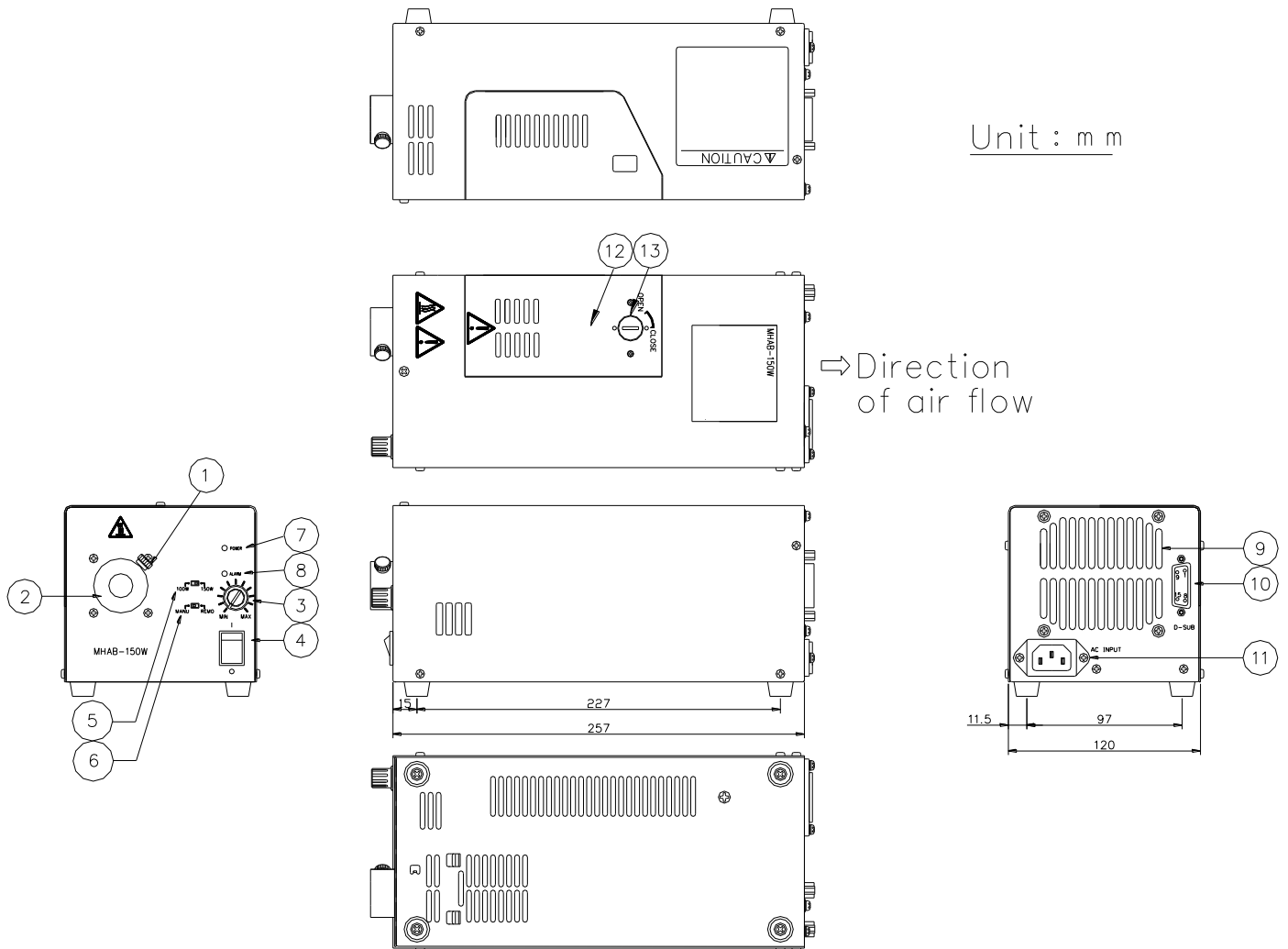
Unit : mm

⇨Direction of air flow

① **Light guide ferrule fixing screw:**
Turn this knurled screw to fasten the light guide ferrule.
② **Light guide connector:**
Connection to the optical fiber light guide.
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 15 of this manual (Replacing the lamp).
⑤ **100W/150W Lamp selector switch:**
Switch for adjusting Lamp Supply Power to relevant Lamp Type (Select 150W for LM-150/C, 100W for LM-100).
⑥ **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.

⑦ **Power indicator:**
The light is ON when the power switch is ON.
⑧ **Lamp alarm indicator:**
The light is ON when the lamp is blown, or in case of any other abnormality.
⑨ **Cooling fan:**
Be careful to keep at least 50mm of space to the rear of the equipment for adequate ventilation.
⑩ **External signal connector (D-SUB):**
Connector for the REMO signal and the alarm signal. Be careful to switch the MANU / REMO selector switch to REMO if you want to use the connector for REMO signal.
⑪ **AC power supply inlet**
Connection to the AC power supply via power supply cord.
⑫ **Lamp room (box) door:**
Only open this cover when replacing the lamp. Read page 15 of the instruction manual "Replacing the lamp" carefully.
⑬ **Latch for lamp room door:**
Turn this latch to "OPEN", for opening the lamp room (box) door (⑫).

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 (6) 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 connecting an analog voltage of 0 - 5V at the external signal connector (10) at the rear panel of the unit. This function is only activated, if the MANU / REMO selector switch (6) on the front panel of the unit is set to REMO. See page 14-15 for detailed description of the external signal connector.

- **Lamp ONIOFF function**
  The lamp can be turned ON / OFF by an external signal. When connecting a 5-24Vdc signal to the external signal connector (10) 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, Pins 3/4 of the external signal connector (open circuit in normal condition) are internally short-circuited (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, Pins 7/8 of the external signal connector (open circuit in normal condition) are internally short-circuited (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 (10) at the rear panel of the unit. (Pins 5/6 of the external signal connector (open circuit in normal condition) are internally short-circuited). The power to the lamp is shut down.

- **Shutter function (option)**
  The (optional) shutter function (MHAB-150W-SC/SO) 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. To reset the unit, switch it OFF, wait for 3 seconds and then switch it ON again.

Installation method

⚠ **Caution**	● 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 malfunctions or causes fire.

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
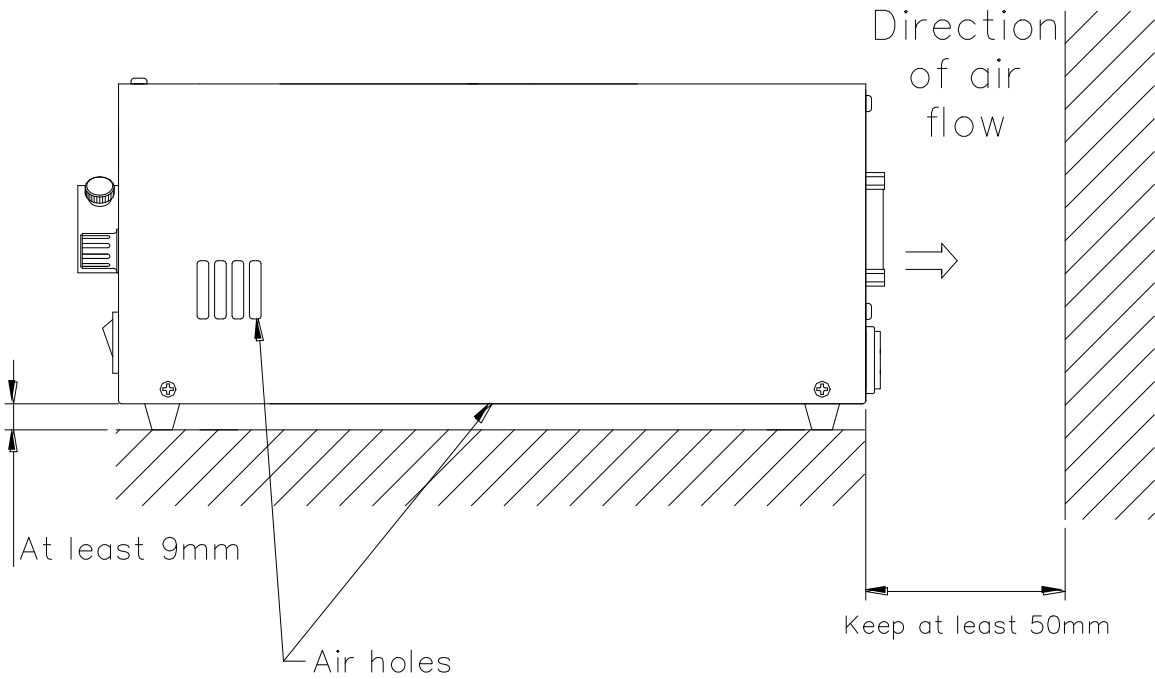
Direction of air flow:	Keep at least　50 mm
Air holes at top of unit:	Keep at least　30 mm
Air holes at side of unit:	Keep at least　20 mm
Air holes at bottom of unit:	Keep at least　 9 mm

※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 (IEC60950-1)

※Always connect the unit to ground before use.

External Signal Connector
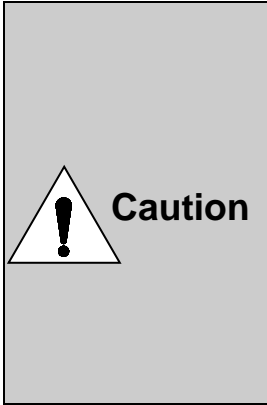
		●Only SELV circuits, which have reinforced insulation to their equipment primary circuit may be connected to the external signal connector. (SELV according to EN60950-1)
⚠	**Caution**	●Be careful not to apply an excessively large input or load to the connection pins, because otherwise the light source 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.

■ Interface specification

```
1 2 3 4 5 6 7 8
○  · · · · · · · ·  ○
    · · · · · · ·
9 10 11 12 13 14 15
```
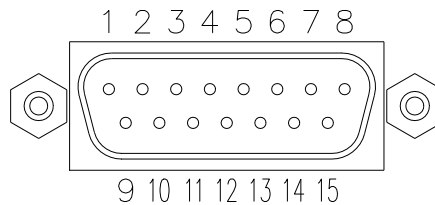
Pin No.	Function	Pin No.	Function
1	Lamp ON/OFF signal input[1][2]	9	External VR input
2	Lamp ON/OFF(GND) [1][2]	10	External input (max light intensity at 0~5 VDC)
3	Over current monitor[3] （Open Collector）	11	GND
4	Over current monitor[3] （Open Emitter）	12	External input/External VR Selector
5	"Lamp off" signal[3] （Open Collector）	13	VR bias voltage output （+2.5V）
6	"Lamp off" signal[3] （Open Emitter）	14	Shutter ON/OFF input [4] (DC24V)
7	Abnormal temperature signal[3] （Open Collector）	15	Shutter ON/OFF input [4] (GND)
8	Abnormal temperature signal[3] （Open Emitter）		

※1 Use between 5Vdc and 24Vdc.

※2 Do not change the input during operation.

※3 Supply voltage below 24Vdc or current below 10mA to this pin.

※4 Option

■ External Connector (cable side)

When controlling the light intensity quantity externally, recommended connector and connector case are as follows:

● Connector (female): HDAB-15S (05)(made by HRS) or its equivalent
● Connector case: HAD-CTH (10)(made by HRS) or its equivalent

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■ How to use remote adjusting function

For controlling the light intensity of the lamp by external signal, please follow the instructions as shown below.
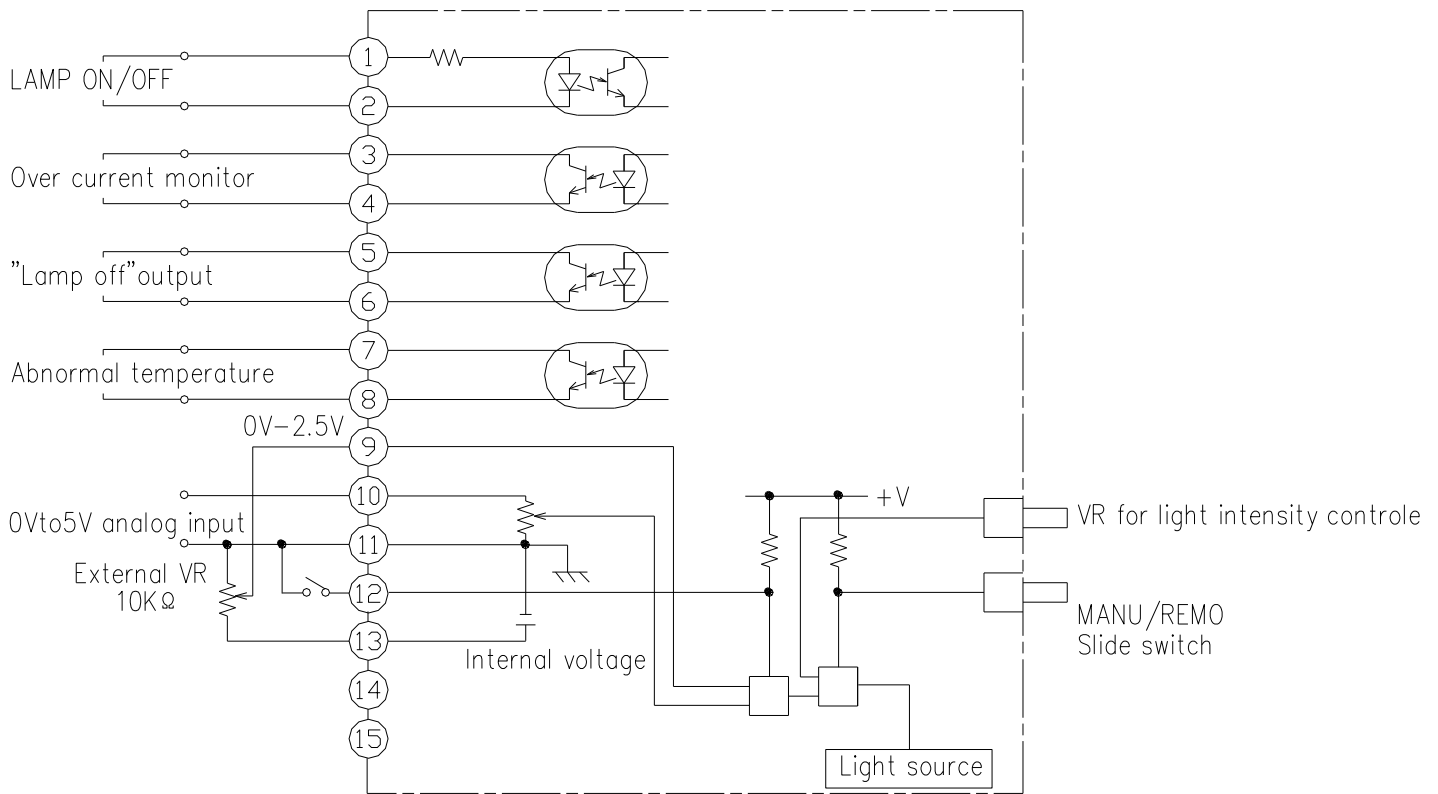
Following kinds of controls are possible when connecting like shown above.

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)

When the unit is in remote mode, the following selections can be made, depending on the state of pin ⑫ of the external signal connector.

When pins ⑪ and ⑫ are open:

The light intensity can be adjusted from 0 to MAX by varying the input voltage (0-5V) to pin ⑩. (A voltage dividing resistor of about 10kOhm is connected internally between pins ⑩ and ⑪.)

When pins ⑪ and ⑫ are closed:

The light intensity can be adjusted from 0 to MAX by varying the input voltage. (An internal voltage of 2.5V can be taken from pin ⑬, if the load current does not

exceed 2mA. This voltage can be used as bias voltage for an external variable resistor.)

Pin ⑫ is an open-collector type input, pulled up to 5 Vdc by an internal 10kOhm resistor. Use a load current below 2mA for the 2.5V bias voltage on pin ⑬

Examples of remote control:

1) **Preset 1**

Adjust the external light control knob (intensity control) for a correct light intensity. Applying twice the voltage of pin ⑨ to pin ⑩ yields about the same light intensity.

2) **Preset 2**

It is possible to put in separate control voltages to pins ⑨ and ⑩ for setting different light intensities. The intensities can be switched over rapidly by opening / closing pin ⑫.

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Replacing the lamp

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

⚠ **HOT**	●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.
⚠ **CAUTION**	●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-150/LM-150C/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.
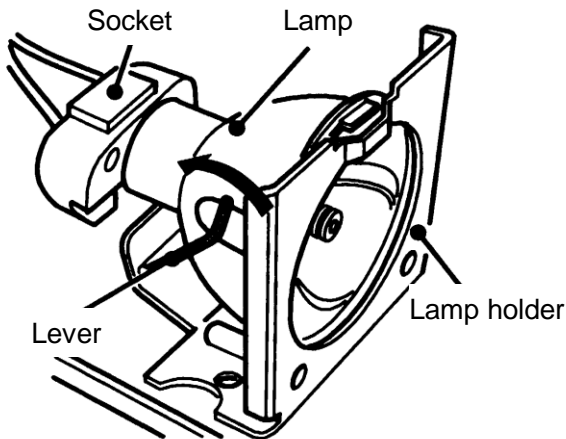
3 Carefully remove the blown lamp from the holder.

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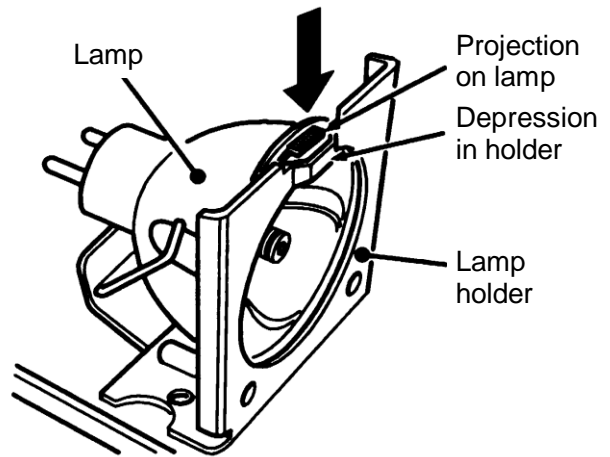
6 Keep pushing the socket to the lamp until it fixes in firmly.

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. MHAB-150W-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
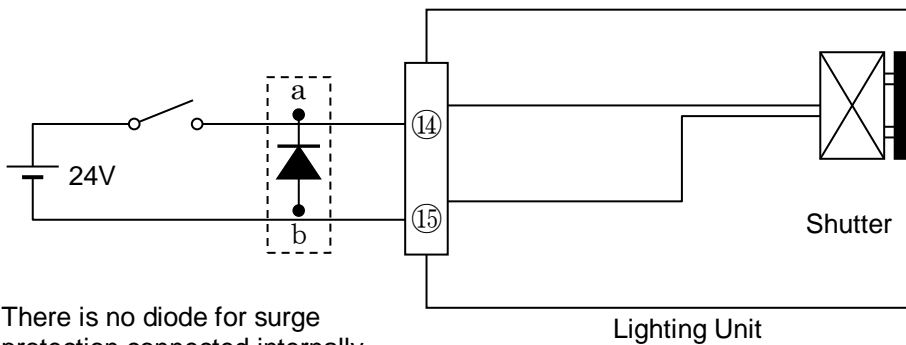
There is no diode for surge protection connected internally. For connecting an external diode, please refer to the schematic above and to diode specifications below.

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 μA

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 ℃ ／ 20－80 ％ RH		
Lifetime	50,000,000 times ※1		
Max. continuous operation	1 hour (at 20 ℃) ※2		
Response time		SO	SC
ON time	33 ms （max.）	open→close	close→open
OFF time	33 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	41 ms	open→close	close→open
OFF time	53 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.)	● Check the power plug, for correct plug-in.	● Insert the plug correctly into the power outlet.
The lamp does not light when the unit is switched ON. (The fan does work.)	● The lamp might be blown. ● Check the light intensity control.	● 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.	● Check the MANU / REMO selector switch.	● 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.	● The lamp may have blown.	● 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.
  Do not hesitate to contact the store where you purchased this product or our sales office for anything unknown about after-sales service.
- 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.

  * When placing an order for repair, give us information on the following points:

● Model: MHAB-150W ● Mfg No.: Described on the label of the equipment ● Date of purchase: DD/MM/YY ● State of trouble: In detail as far as possible ● Your name (juridical person or individual's name), address, and phone number

General Specification

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

Item	MHAB-150W	Using 100W Lamp	MHAB-150W-C
Lamp type	Halogen lamp with dichroic reflector		
Lamp model	LM-150 (15V 150W)	LM-100 (12V 100W)	LM-150C (15 150W)
Circuit method	PWM regulated switching type		
Rated input voltage	AC 100 – 120 / 200 – 240[V]　50/60[Hz] TN-S power distribution system		
Input current	2.2A (at 100Vac) 1.0A (at 240Vac)	1.6A (at 100Vac) 0.7A (at 240Vac)	2.2A (at 100Vac) 1.0A (at 240Vac)
Rush current	Less than 12A (Input Voltage : 100Vac, air temperature 25℃, cold start) Less than 29A (Input Voltage : 240Vac, air temperature 25℃, cold start)		
Environmental Conditions	Indoor use Altitude up to 2,000m Temperature 0℃ to 45℃ Maximum relative humidity 80% for temperatures up to 31℃ deceasing linearly to 50% relative humidity at 40℃ Pollution degree 2 Installation category 2		
Lamp voltage (standard)	14.7Vdc±0.2V (maximum)	11.7Vdc±0.2V (maximum)	14.7Vdc±0.2V (maximum)
Average lamp life	Normal 50H (15.0Vdc)	Normal 1,000H (12.0Vdc)	Normal 500H (15.0Vdc)
Illuminance ※1	Approx 80,000 lx	Approx 30,000 lx	Approx 45,000 lx
Color temperature ※2	Approx 3,400 K	Approx 3,100 K	Approx 3,200 K
Light dimming system	Variable voltage type		
External dimming method Adjustment function	Yes (analog input between 0 – 5V)		
Protection function ※3	Output cutoff :Overload detector, Lamp burn-through detector, temperature fuse Input cutoff :Overload detector, internal fuse		
Cooling method	Forcible cooing by the fan (force air cooling)		
Installation method	Install horizontally on the rubber feet at the bottom of the unit		
Dimensions ※4	120(W)×110(H)×257(D)mm		
Weight	Approx 3.2kg		
IP code	IP20 (By IEC60529)		
CE Marking ※5	LVD : 2014/35/EU　,　EMC : 2014/30/EU RoHS : 2011/65/EU, 2015/863		

(Note)
※1　Measure value, 50mm from the edge of the unit. Standard MORITX light guide is installed; color temperature is at maximum value.
※2　Color temperature of lamp at the maximum illuminace.
※3　Error signal is put out on the external signal connector on the rear panel of the unit.
※4　Dimensions do not include the projection part.
※5　The MHAB-150W/-C series 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　At the time of source of light device 150W setting, I cannot use plastic fiber light guide.

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

Item	MHAB-150W-SC/SO	Using 100W Lamp	MHAB-150W-C-SC/SO
Lamp type	Halogen lamp with dichroic reflector		
Lamp model	LM-150 (15V 150W)	LM-100 (12V 100W)	LM-150C (15 150W)
Circuit method	PWM regulated switching type		
Rated input voltage	AC 100 – 120 / 200 – 240[V]　50/60[Hz] TN-S power distribution system		
Input current	2.2A (at 100Vac) 1.0A (at 240Vac)	1.6A (at 100Vac) 0.7A (at 240Vac)	2.2A (at 100Vac) 1.0A (at 240Vac)
Rush current	Less than 12A (Input Voltage : 100Vac, air temperature 25℃, cold start) Less than 29A (Input Voltage : 240Vac, air temperature 25℃, cold start)		
Environmental Conditions	Indoor use Altitude up to 2,000m Temperature 0℃ to 45℃ Maximum relative humidity 80% for temperatures up to 31℃ deceasing linearly to 50% relative humidity at 40℃ Pollution degree 2 Installation category 2		
Lamp voltage (standard)	14.7Vdc±0.2V (maximum)	11.7Vdc±0.2V (maximum)	14.7Vdc±0.2V (maximum)
Average lamp life	Normal 50H (15.0Vdc)	Normal 1,000H (12.0Vdc)	Normal 500H (15.0Vdc)
Illuminance ※1	Approx 80,000 lx	Approx 30,000 lx	Approx 45,000 lx
Color temperature ※2	Approx 3,400 K	Approx 3,100 K	Approx 3,200 K
Light dimming system	Variable voltage type		
External dimming method Adjustment function	Yes (analog input between 0 – 5V)		
Protection function ※3	Output cutoff :Overload detector, Lamp burn-through detector, temperature fuse Input cutoff :Overload detector, internal fuse		
Cooling method	Forcible cooing by the fan (force air cooling)		
Shutter function Option	Yes		
Installation method	Install horizontally on the rubber feet at the bottom of the unit		
Dimensions ※4	120(W)×110(H)×257(D)mm		
Weight	Approx 3.2kg		
IP code	IP20 (By IEC60529)		
CE Marking ※5	LVD : 2014/35/EU　,　EMC : 2014/30/EU RoHS : 2011/65/EU, 2015/863		

(Note)
※1　Measure value, 50mm from the edge of the unit. Standard MORITX light guide is installed; color temperature is at maximum value.
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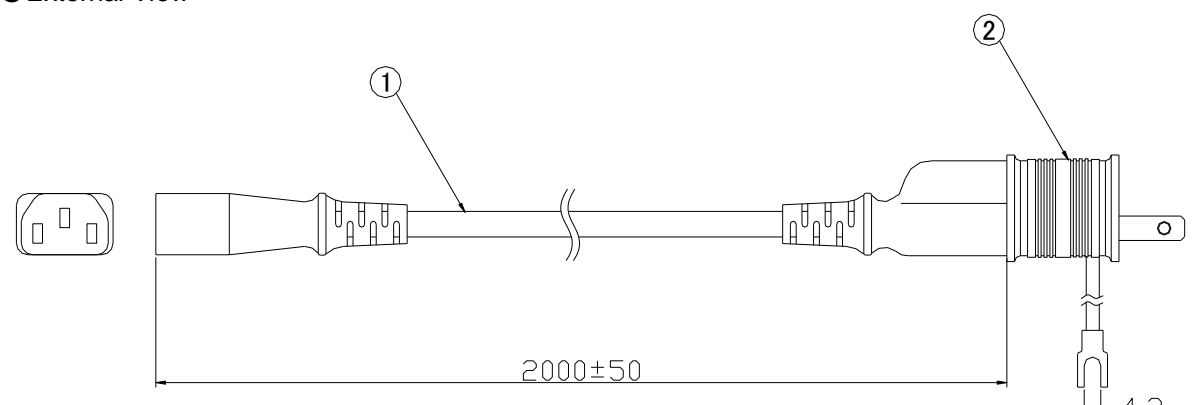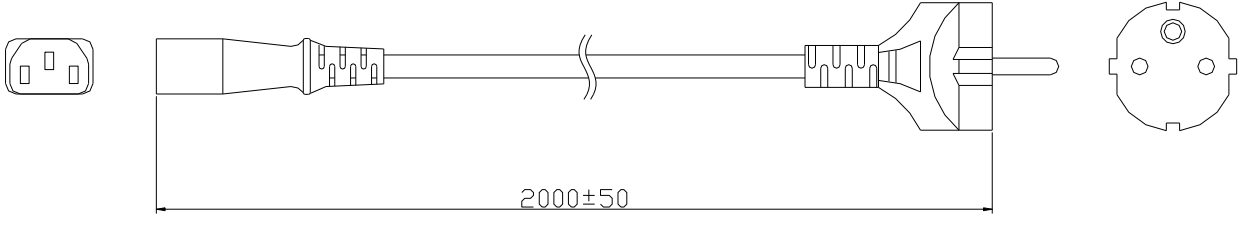※6　At the time of source of light device 150W setting, I cannot use plastic fiber light guide.

Accessories

● Instruction Manual・・・・・・・・・・・・・・・・・・・・・・・・・・・・・1 (This book)
● AC Code Set ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・1 ※

> ※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 AC100V

●Application
　① Power Code Set with Plug: Complies with the Electrical Appliance and Material Safety Law and UL and CSA Standards.
　② Adapter: Complies with Complies with the Electrical Appliance and Material Safety Law. <u>Unusable outside Japan.</u> If the unit is used in any nation other than Japan, remove the adapter.
●Type：MC-AC100A-2.0M
●External View

■Specification of AC200V

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

* The user has to provide an appropriate power supply cord set, conforming to the relevant EU Directives / EN standards with following configurations:

Length: < 3 m

Conductors: L / N / PE

Class I type mains plug with reliable connection to the Protective Earthing Conductor of the Building Installation.

MEMO

お問い合わせは・・・・.

株式会社　モリテックス

国内営業部　　　　　　　　　　　　　TEL 048-218-2534 ／ FAX 048-462-6713
〒351-0024　埼玉県朝霞市泉水 3-13-45
E-mail　: moritex.mvs@moritex.com
URL　　: www.moritex.co.jp

For inquiry, please contact to:

MORITEX Corporation
3-13-45, Senzui, Asaka-shi,
Saitama 351-0024
Japan
Phone : +81-(0)48-218-2525
Fax　　: +81-(0)48-462-6713
E-mail : moritex.sales@moritex.com
URL　　: www.moritex.co.jp
　　　　: www.moritex.com

MORITEX Technologies (Shenzhen) Co., Ltd.
No.20, Guiri Road, Daping Village,
Guanlan, Longhua New District,
Shenzhen, 518110
China
Phone : +86 (0)755-2798-8282
Fax　　: +86 (0)755-2798-8575
E-mail : sales.china@moritex.com
URL　　: www.moritex.com

MORITEX North America, Inc.
6862 Santa Teresa Blvd.
San Jose, CA　95119　USA
Phone : +1-(0)408-363-2100
Fax　　: +1-(0)408-363-9980
E-mail : machine.vision@moritex.com
URL　　: www.moritex.com

Moritex Asia Pacific Pte. Ltd.
60 Paya Lebar Road #06-31,
Singapore 409051
Phone : +65-(0)6898-0835
Fax　　: +65-(0)6898-0836
E-mail : sales.AP@moritex.com
URL　　: www.moritex.com

MORITEX Europe representative office
Mühlbachstr. 20 82229 Seefeld, Germany
E-mail : inf.eu@moritex.com
URL　　: www.moritex.com

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