Instruction Manual **SUNJE**

SXN-05U c(UL)us Eng

It is recommended that only persons who have sufficient knowledge and experience such as system designers and responsible persons deal with this product after carefully reading the product manual.

❶ The matters of safety

⚠ **WARNING**

* Do not fabricate or do maintenance by yourself. Malfunction, Electric shock, and fire danger are considered. Contact us directly if you need the item to be repaired.
* Do not let the water touch the product. It may cause electric shock or fire due to malfunction.
* When you check or maintain the product, make it sure you turn off the power. It may cause electric shock or fire due to malfunction.
* The item should be fixed to the target tightly. Electric discharging or breakage might happen.
* Please shield your installing circumstances first since the item releases the soft X-ray. Direct X-ray exposure is not recommended owing to cause health problem.
* It includes a beryllium window on the X-ray tube unit in order to release soft X-ray for ionization. This beryllium material can cause respiratory disorder only if the person gets exposed to forms of either beryllium powder or smoke. However, our device doesn't creat beryllium in neither of the mentioned forms. Please be careful not to break the device since there might be a slight chance that the device could partially degrade into the powder form, then it can cause harm defects. If the user touches the beryllium material on the device, clean oneself on the running water or rinse it off with soap directly.
If the beryllium windonw gets dirty or damaged, call us directly for assistance.
* Do not use the product at the place where dangerous material such as inflammable or ignitable material exists. This product is not the product of anti-explosive type.
* This device is made only for industrial uses. You need to ground the device beforehand. Otherwise, there are in case of malfunction, electric shock, or fire damage.

❗ **CAUTION**

* Do not disconnect the head cable with power applied. There is a possibility of electric shock or malfunction.
* Connect wires referring to the product manual. Wrong connection can cause failures.
* For your proper cable connection, take a look at the manual 「Installation & Connection」for references. Any disordered connection is detected, the malfunction might arise.
* All cables should be connected all the time. Please careful of cable disconnections. If power or communication cables got damaged, replace them immediately. Malfunction and fire danger may happen.
* Do not install the device where the vibration can be detected. Any minor impact or vibration on the device, the malfunction or danger of accident might happen.
* Do not use the item off the range of usage(Electrostatic elimination). Malfunction or danger of accident may occur.
* If you wish to discard the head unit of X-ray device, you need to report for disuse declaration to the institution(s) where they ask to. A proper declaration procedure is neccesary in order to disuse X-ray device.
* Please contact to either Korea Institute of Nuclear Safety(KINS) or a safety supervisor of Sunje directly.

❷ Check the package contents

▶ Product compositions
The package includes the following products composition.

* Head
SXN-05U
1 ea

* Fixing Bolt
SFB-XN-1-001
1/4"-20unc x 15L/ 1ea
1/4"-20unc x 8L/ 1ea
M4 x 0.7Pitch x 10L/ 2ea

* Adapter
SAD-MT-1-001
INPUT : AC100~240V,
50/60Hz
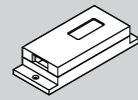OUTPUT : DC12V, 2A
1.6m / 1ea

* Output Cable
SOC-XN-3-003
5m / 1ea

* Extension Power Cable
SEC-MT-1-001
10m / 1ea

* Power Cable
SPC-MT-1-001
AC 100V, 50/60Hz,1.8m / 1ea
or

* Power Cable
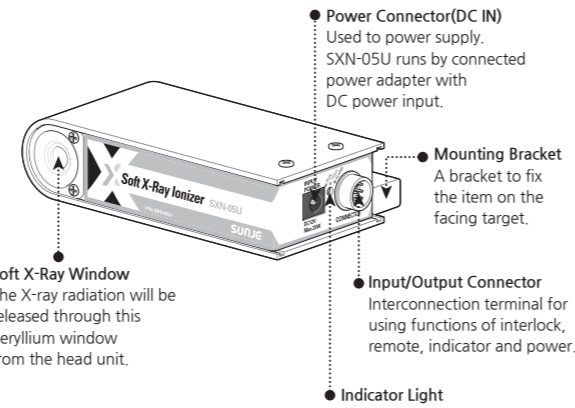SPC-MT-2-001
AC 220V, 50/60Hz,1.8m / 1ea

▶ Option
If you require extra functions with the basic accessories we provided, you need to purchase optional items in below for further assistant.
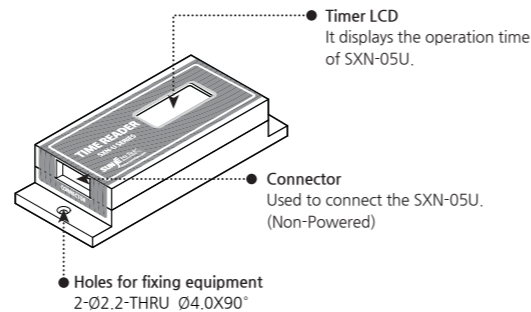

* Time Reader
SXN-U Timer Reader / 1ea

❸ Nomenclatures of parts

▶ SXN-05U

● Power Connector(DC IN)
Used to power supply.
SXN-05U runs by connected power adapter with DC power input.

● Mounting Bracket
A bracket to fix the item on the facing target.

Soft X-Ray Window
The X-ray radiation will be released through this beryllium window from the head unit.

● Input/Output Connector
Interconnection terminal for using functions of interlock, remote, indicator and power.

● Indicator Light

● Green LED (RUN)	Operating indicator	Green LED will be on when the item is in operating condition.
● Orange LED (TIMER)	Tube replacement Alarm indicator	Orange LED will be turned on when the lifetime of X-ray tube is exceeded.
● Red LED (ALARM)	Malfunction Indicator	When false operation, Red LED will be on.

▶ SXN-U Time Reader (Option)

● Timer LCD
It displays the operation time of SXN-05U.

● Connector
Used to connect the SXN-05U.
(Non-Powered)

● Holes for fixing equipment
2-Ø2.2-THRU Ø4.0X90°

❹ Installation and connection

▶ Check the installation conditions head unit
Please check the installation condition whether it meets proper specification.

■ Shielded room
■ There must be no objects between the target area and X-ray device.
■ No vibration on the fixed device.

■ Be aware of any flammable or ignitable materials around the working area.
■ Secure to have enough working space for quick maintenance of the device.

▶ Head unit fixing
Fix the target product on the fixed area where you install by using supported fixing bolt(s).

1/4"-20UNC x 15L or 8L
M4 x 10L
M4 x 10L

Fixable Object

Mounting Bracket
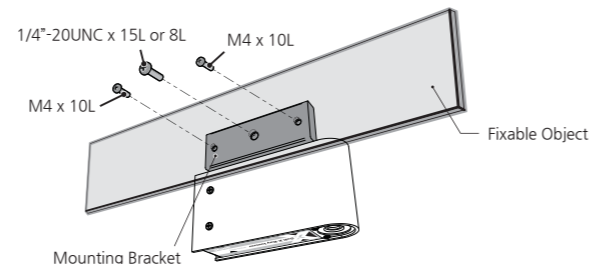
▶ Shielding methods

Shielding Material Selection

See the following graph for references.
Select the ideal tickness and quality of shielding material.

Shielding Rate(%) / Thickniss(mm)
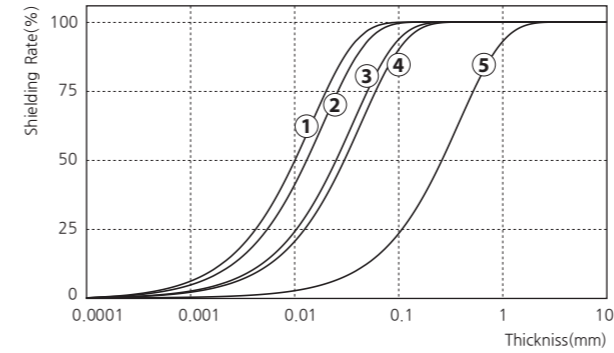
No.	Shield Material	Thickness [mm]
①	SUS	Over 0.2
②	Aluminium	Over 0.25
③	Glass	Over 0.5
④	PVC	Over 0.6
⑤	Acrylic	Over 5.0

⚠ **WARNING**
* Please shield the area where the customer is willing to install the soft X-ray device for safety issue.
* After shielding process, please connection to your own interlock system to operate the X-ray device On/Off when the door is opened/closed.

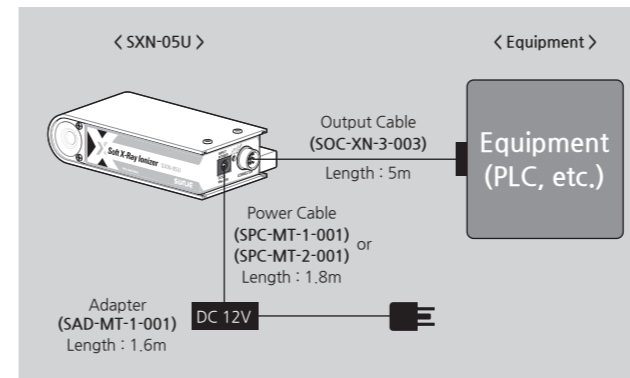▶ Shield installation compositions
Please refer to the "Installation Compositions" for your references.
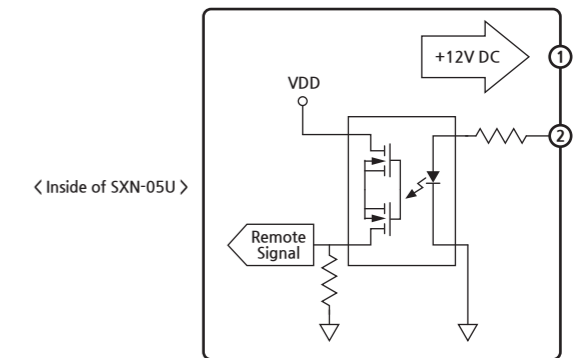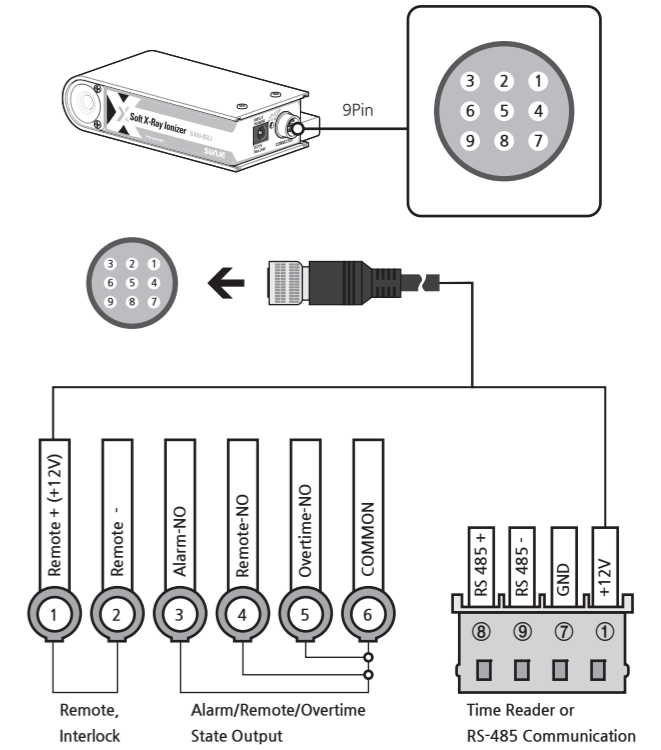Please keep your working environment of the leakage radiation level within the range of 1μSv/hr all the time.

Output Cable
Head Unit
Interlock
Shield Door
Shield
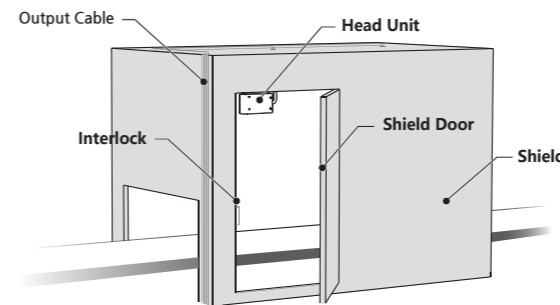
▶ How to connect

Connecting the Output Cable and Power Cable

Connect output cable supplied with power cable with SXN-05U.
Connect another side of output cable with equipment.

〈 SXN-05U 〉   〈 Equipment 〉

Output Cable
(SOC-XN-3-003)
Length : 5m

Equipment
(PLC, etc.)

Power Cable
(SPC-MT-1-001) or
(SPC-MT-2-001)
Length : 1.8m

Adapter
(SAD-MT-1-001)   DC 12V
Length : 1.6m

Output Cable No.

9Pin

Remote + (+12V)
Remote -
Alarm-NO
Remote-NO
Overtime-NO
COMMON
RS 485 +
RS 485 -
GND
+12V

① ② ③ ④ ⑤ ⑥   ⑧ ⑨ ⑦ ①

Remote, Interlock On/Off
Alarm/Remote/Overtime State Output
Time Reader or RS-485 Communication

+12V DC
VDD
〈 Inside of SXN-05U 〉
Remote Signal

❗ **CAUTION**
* +12VDC come out through No.1(Remote+) and is applied to No.2(Remote-). Please be careful with not to have any contact with external circuit.

Output Cable Specifications

Signal	No.	Color	Pin Name	Function
Input	1	Yellow	Remote + (+12V)	The terminal is for On / Off function of the product. (Close: Ionizer On, Open: Ionizer Off) 1: 12V Out / 2: 12V In
	2	Black on Yellow	Remote -	
Output	3	Orange	Alarm-NO	When alarm occurs, it opens with common terminal.
	4	Pink	Remote-NO	When remote function works, it is closed.
	5	Black on Orange	Overtime-NO	Replacement cycle alarming function helps it to be closed with common terminal after 4,500 hours use.
	6	Gray	Common	It is common terminal for Alarm, Overtime, Remote State.
Time Reader / RS485	1	Black on Gray	+12V	An Input power terminal of Time Reader.
	7	Black on Pink	GND	-
	9	White	RS485 -	RS 485(-) communication terminal.
	8	Black on White	RS485 +	RS 485(+) communication terminal.

❗ **CAUTION**
* As SXN-05U requires CD 12V, do not connect with any product using DC24V. There could be danger of malfunction, electric shock, and fire. (Be cautious when connecting Remote/Interlock)

Connecting to the SXN-U Time Reader (Option)

It enables you to check the hours of use outside the equipment connecting Time Reader sold seperately. Use output cable to connect SXN-05U with Time Reader.
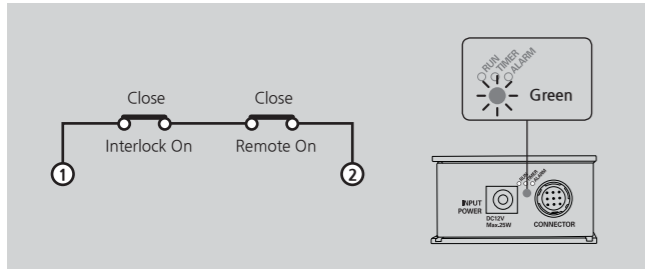

〈 SXN-05U 〉

+12V	①
GND	⑦
RS 485 -	⑧
RS 485 +	⑧

Output Cable

〈 Time Reader 〉
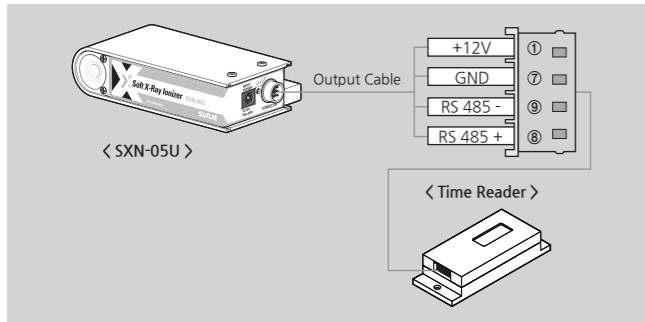
5 How to set

▶ Set the Remote / Interlock

Remote / Interlock On

When the contact of output cable No.1 and No.2 is closed, it changes to remote / interlock on.
It means that the door of shielding material is securely locked and ready to operate.
Green LED(RUN) on the back of product is turned on under remote/interlock on.

Remote / Interlock Off

When the contact of output cable No.1 and No.2 is opened, it changes to remote / interlock off.
It means that the door of shielding material is opened and the product doesn't operate.
Under interlock off state, product doesn't work despite remote on.
Green LED(RUN) on the back of product is turned off under remote/interlock off.

| Signal		Product Operation State
Open Interlock On ①	Open Remote On ②	Off
Close Interlock On ①	Open Remote On ②	Off
Open Interlock On ①	Close Remote On ②	Off

▶ Alarm state output

Alarm On

When the contact of output cable No.3 and No.4 is opened, it changes to alarm on.
Under alarm on state, it instructs the malfunction of product as red LED(ALARM) on the back of product is turned on.
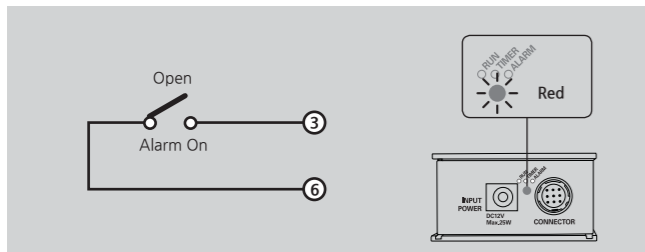

Alarm Off

When the contact of output cable No.3 and No.4 is closed, it changes to alarm off.
Under alarm off state, it indicates normal operation of product and red LED(ALARM) on the back of product is turned off.
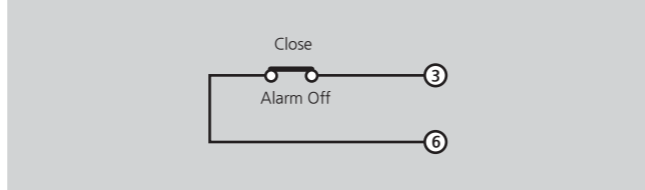
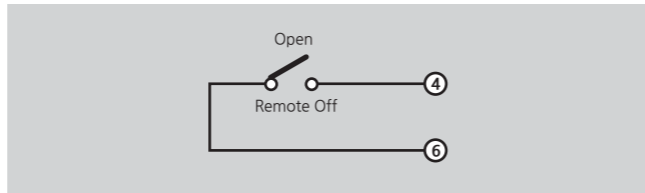### ▶ Remote state output

Remote On

When the contact of output cable No.4 and No.6 is closed, it changes to remote on.
Under remote on state, it indicates normal operation of product and green LED(RUN) on the back of product is turned on.
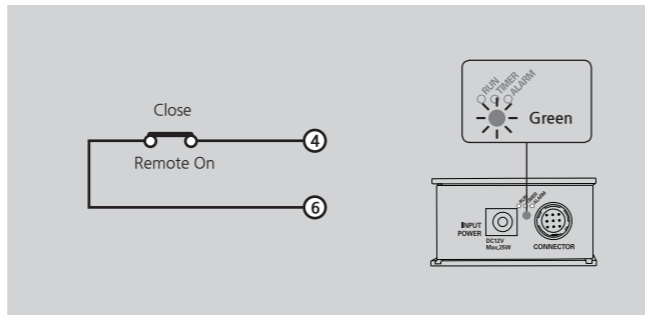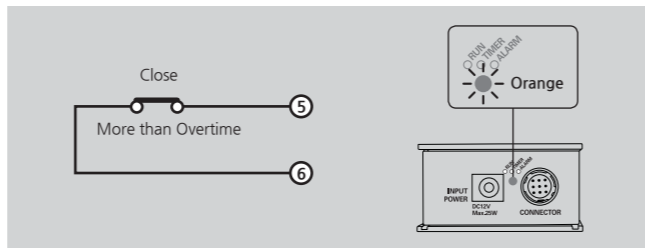

Remote Off

When the contact of output cable No.4 and No.6 is opened, it changes to remote off.
Under remote off state, product doesn't work as green LED(RUN) on the back of product is turned off.
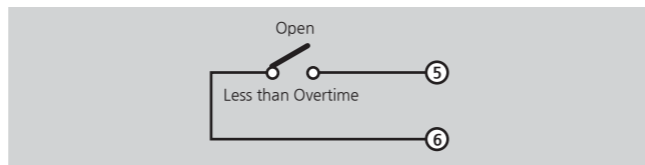

▶ Overtime State Output

More than Overtime

When the usage time is exceeded, orange LED(TIMER) is turned on, and it means the replacement time.

Less than Overtime

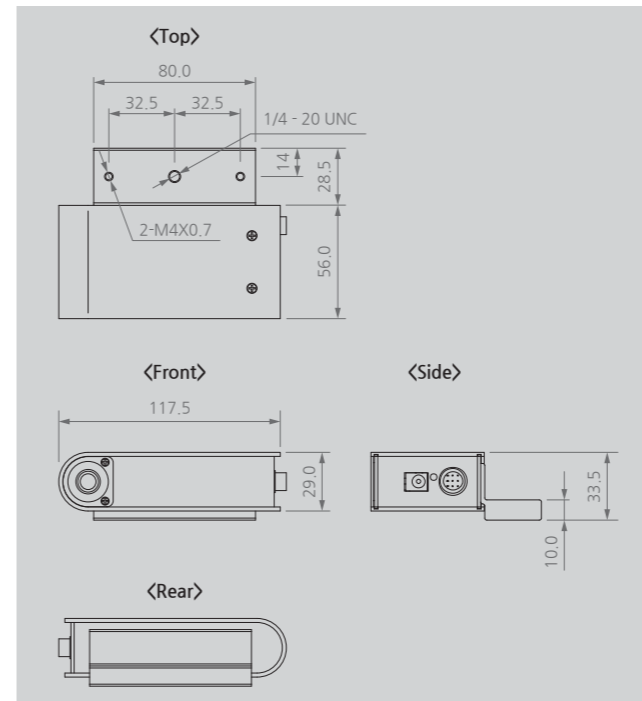When the usage time is within the limit, orange LED(TIMER) doesn't turned on, and it means does not replacement time.
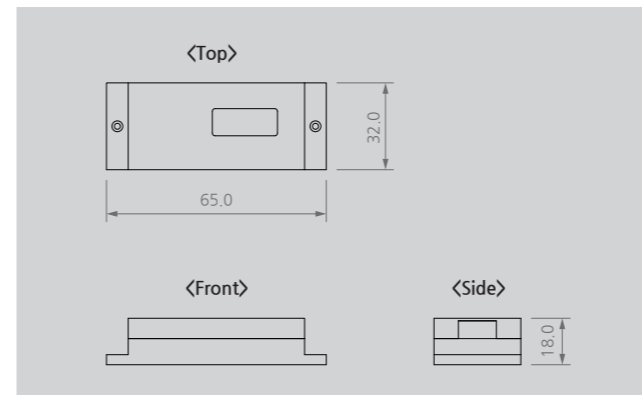

6 Problem solving

▶ Checklist before called

Problem	Identifying Problem	Solution
Not Operating	Is your power cable still plugged in?	Please re-plug the power cable and then turn the device on again.
	Was the proper voltage level applied for this set-up?	Please use the proper level of power input for the device. (AC 100~240V, 50/60Hz)
	Is remote off?	Clear the remote off corresponding to 「Remote Setup」 manual.
	Is Interlock off?	Place interlock on corresponding to 「Interlock setup」 manual.
No Signal	Have you followed the proper procedure for Input/output signal cable(s)?	Check whether the cable connection is properly done.
Decreased Performance	Any damages or cut on the cables?	You need to replace the cables if it gets cut or damaged.

7 Dimensions

▶ SXN-05U

〈Top〉
80.0
32.5 32.5
1/4 - 20 UNC
14
28.5
2-M4X0.7
56.0

〈Front〉
117.5
29.0

〈Side〉
33.5
10.0

〈Rear〉

▶ SXN-U Time Reader (Option)

〈Top〉
32.0
65.0

〈Front〉

〈Side〉
18.0

8 Specification

Parameter	Description / Value
Ion Generation Method	Soft X-ray
Dimensions	Please Refer to Dimension Drawing
Source	Soft X-ray Tube
Tube Voltage	4.9kV
Tube Current	400uA
Cooling Method	Natural Air Cooling
Mounting Method	Bolt Mounting with Bracket
Power Cunsumption	8W
Current Cunsumption	Max. 36mA (AC 220V)
Operation Circumstance	0℃ ~ +50℃(32℉ ~ 122℉), 35% ~ 85% RH
Weight	0.4Kg
Input Power	AC 100~240V, 50/60Hz(Adaptor Input) _DC 12V, 1A Adapter
Alarm	Head Fail
Warning	Life Time Over
Remote / Interlock	Remote / Interlock On/Off Control
Indicator	Alarm State, Over Time State
Warranty	1 Year

※ The appearance and specification of the product may be changed without prior notice for the improvement of the product.

SUNJE Hi-Tek Co., Ltd.

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