Ultra-Early Machine Failure Sign & QA

AE Logging System

Early Observer MEL-E Type Uno 1st

Specifications & Instruction Manual

JCC Co., Ltd.

History

Document No.	Date Revision	Description
FNF 0040 500	28, Nov., 2023	1st edition Japanese document FNF 0040 10G
FNF 0040 501	1, Apr., 2024	P2,3,16 Added MELSEC iQ-F P4 Added Value of AE sensor. Environmental and Impact resistance P18 Added Precautions when measuring AE on a PC.
FNF 0040 502	26, Mar., 2026	P2,4,17 Corrected typos P2,11,16,18 Added “FG”Ground P9 Added HPF setting , P10 Added Tips Back cover Delete Tokyo office
FNF 0040 503	5, Jun., 2026	P17 Time display correction

Safety precautions

(Be sure to read before use.)

Thank you for purchasing JCC product. Before using this product, be sure to read this manual carefully to acquire full knowledge of the equipment and understand all the safety information and precautions for correct use.

- This manual should be kept by the person who actually uses this product.
- Keep this manual handy for future reference.

Description of signal words

In this manual, safety precautions are classified into two levels: "Warning" and "Caution."

Indication	Meaning
Warning	Indicates a potentially hazardous situation that is caused by mishandling and could result in death or serious personal injury.
Caution	Indicates a hazardous situation that is caused by mishandling and could result in minor injury and/or property damage.

Even instructions and precautions provided with the ⚠Caution sign may result in serious consequences depending on the situations.
Be sure to follow the instructions and precautions because they are all important.

Description of symbols

Indication	Meaning
	Indicates prohibited actions.
	Indicates mandatory actions.

1. Usage precautions

Warning	
	- Don't open the case of the amplifier. Otherwise, an electric shock may occur. - Don't use the product without the terminal cover attached. Otherwise, an electric shock may occur.
	- Don't damage, apply excessive stress to, place a heavy object on, or pinch the cables. Otherwise, an electric shock may occur.
	- Be sure to turn off the power before moving the product, connecting cables, or performing inspections. - Provide a safety circuit outside the amplifier so that the entire system can operate safely even in the event of a breakdown of the amplifier or sensor. - Apply only the specified voltage to each terminal. Otherwise, a blowout, breakage, or fire may occur.
	- Connect FG to the ground.

⚠ Caution	
	- Don't use the product in a corrosive or flammable atmosphere or near combustible materials. - Don't use the amplifier where it is exposed to water splash.

2. Storage

⚠ Caution	
	- Don't store the product where it is exposed to rain or water splash or where harmful gas or liquid exists.
	- Store the product within the specified temperature and humid ranges and where it isn't exposed to sunlight.

3. Transfer

⚠ Caution	
	- Don't move the product by pulling the sensor cables.

4. Installation

⚠ Caution	
	- Don't step on the product or don't place a heavy object on it. - Prevent conductive foreign objects such as screws and metal chips or flammable objects such as oil from entering inside the amplifier.
	- To install the amplifier, use DIN rail and secure the amplifier on it firmly. Otherwise, the amplifier may fall, or a malfunction may occur. - Install the sensors correctly and firmly in accordance with this manual because they are subject to an ambient magnetic field.

5. Cables connection

Warning	
	- Be sure to tighten the terminal board. Otherwise, a fire or malfunction may occur. - Be sure to attach the terminal board cover before energizing or operating the product. - Connect cables correctly and firmly. Otherwise, a fire, breakdown, or malfunction may occur.

6. Operation

Warning	
	- The sensors are subject to an ambient magnetic field. Ensure that other magnets than specified are not placed near the sensors. Otherwise, a malfunction may occur. - The monitor terminal isn't insulated from the internal circuit. Don't connect anything to this terminal during operation. Otherwise, a malfunction may occur.

7. Maintenance and inspection

⚠ Caution	
	- Don't disassemble, modify, or repair the product. Otherwise, an electric shock, breakdown, or fire may occur.

8. Disposal

⚠ Caution	
	- Dispose of this product as industrial waste.

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1. Summary

This material explains about specifications and handling of Early Observer MEL-E Type Uno 1st.

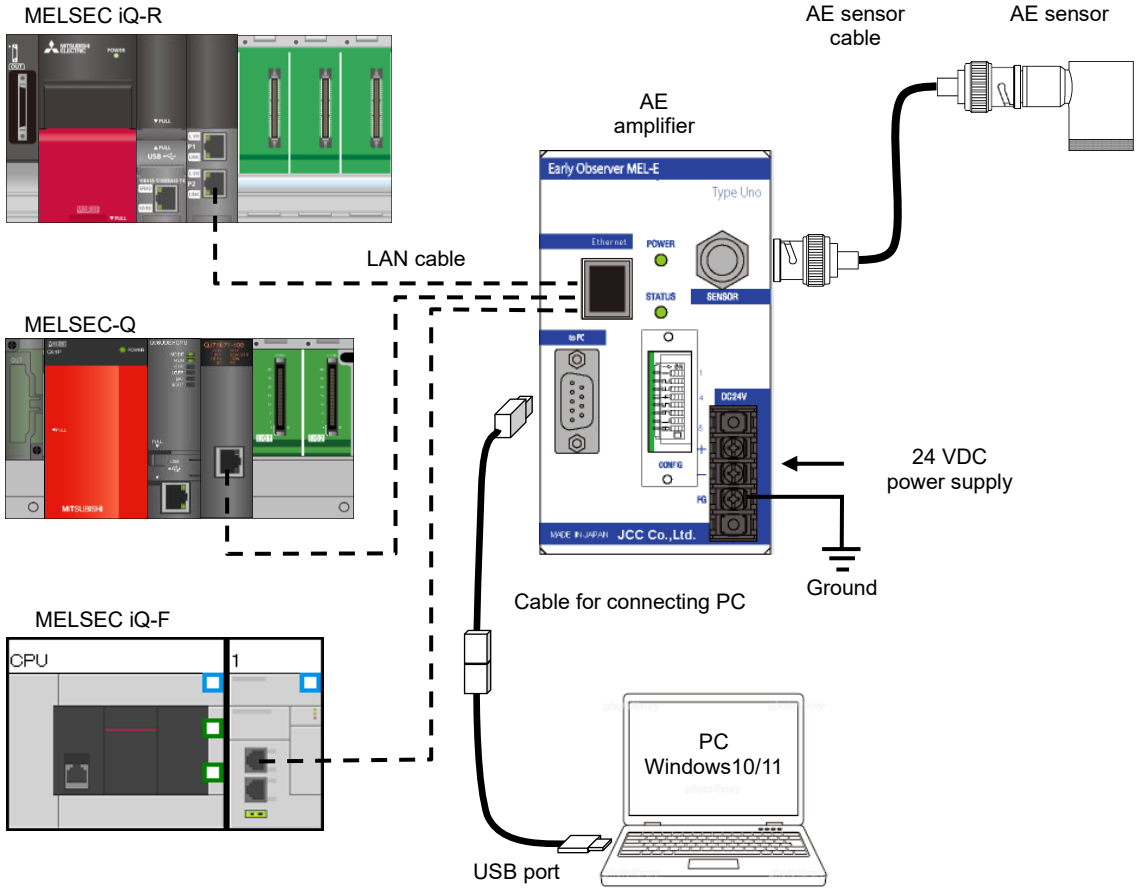
Please note that the described specifications or functions may be changed without notice for technological improvement.

2. Trademarks

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3. Configuration

■ Configuration of equipment



■ List of items configuring the equipment

No.	Item		Model	Remark
1	AE amplifier		EO-MEL-E-Uno-1st	Sulfur resistant coating available
2	AE sensor	Standard sensor	FAEN-S60I	Focus frequency: 60 kHz
			FAEN-S150I	Focus frequency: 150 kHz
			FAEN-S300I	Focus frequency: 300 kHz
		Waterproof sensor	FAEN-S60WI-HRB5	Focus frequency: 60 kHz : equipped with environmentally resistant cable (5 m)
			FAEN-S150WI-HRB5	Focus frequency: 150 kHz : equipped with environmentally resistant cable (5 m)
			FAEN-S300WI-HRB5	Focus frequency: 150 kHz : equipped with environmentally resistant cable (5 m)
3	Sensor bracket		MGBKT No.2	Simple Magnet bracket for standard sensor
			MGBKT No.5-S	Magnet bracket for standard sensor
			MGBKT No.5-W	Magnet bracket for waterproof sensor
4	AE sensor cable	Standard	EO-ST-BNC-□m	□: Length 5/10/15/20 m
		Environmentally resistant robot	EO-HRB-BNC-□m	□: Length 5/10/15/20 m
5	Waterproof relay connector set		EO-CONCT-BNC-W	AE sensor cable relay connector
6	cable for connecting PC		EO-232C/USB2	USB conversion cable set (2.5 m)
7	AC adapter		EO-AC/DC24V	85 to 240 VAC 24 W

4. Specifications

4-1. Specifications of AE amplifier

● **EO-MEL-E-Uno-1st**

Item	Specifications
Data resolution	14 bits
Sampling frequency	10 MHz
Frequency filter	HPF: without filter, 30 kHz, 50 kHz,100 kHz, 150 kHz (-12 dB/oct) LPF: without filter, 500 kHz, 1 MHz (-12 dB/oct) * LPF has been set at shipment-Standard setting value 1MHz
Amplification factor	0 dB, 10 dB, 20 dB, 30 dB, 40 dB, 50 dB (within ±3 dB) * Accurate measurements cannot be made when 0dB is selected.
Applied AE sensor	FAEN-S150(W)I, FAEN-S60(W)I
Connector for AE sensor	BNC
Edge process time	Switched to 10 ms, 20 ms, 50 ms, 100 ms, 1000ms, 2000ms * 1000ms, 2000ms is SERIAL 214 or later. (at shipment: 10 ms)
PLC communication method	Ethernet 100BASE-TX
Recommended Ethernet interface unit	Ethernet interface unit made by Mitsubishi Electric Corporation MELSEC iQ-R : RJ71EN71, RnENCPU (Port 1) MELSEC-Q *1 : QJ71E71-100 MELSEC iQ-F : FX5-ENET *2
	Simultaneous measurement by connecting multiple units via HUB, etc. is not covered by the warranty.
Internal storage device	eMMC (8GB) various setting data is stored (IP address, gain, etc.)
Ambient operating temperature	-10 to +55 °C
Ambient humidity	20 to 80 %RH (with no dew condensation)
Storage temperature	-20 to +75 °C (with no dew condensation)
Conforming standard	CE mark obtained schedule
Power voltage	12 to 24 VDC
Power consumption	5 W or less
Measurement item	Following data within the edge processing period is measured. - Amplitude-MAX [mV] : maximum amplitude value - Energy [dBs] : energy value - RMS [mV] : effective value - Counts [pieces] : 0 V or number of intersection points of setting threshold value - Amplitude-dB [dB] : decibel equivalent of the maximum amplitude value (Amplitude-MAX 5,000 mV = Amplitude-dB 100 dB)
Mass	Approx. 600 g
Outside dimensions	160 mm x 72 mm x 120 mm (D x W x H) protruded part is excluded
Environment	Conforming to RoHS Directive

*1. For the MELSEC-Q series, software for MELSEC communication can be installed on the CPU shown below.

- First 5 digits of QnUDVCPU / QnUDVPCPU serial number are "19012" or later.

*2. Please use firmware version “1.101” or later for the FX5-ENET unit.

4-2. Specifications of AE sensor

Item		Specifications					
		standard sensor			waterproof sensor		
Model		FAEN-S60I	FAEN-S150I	FAEN-S300I	FAEN-S60WI	FAEN-S150WI	FAEN-S300WI
Focus frequency		60 kHz ± 20 %	150 kHz ± 20 %	300 kHz ± 20 %	60 kHz ± 20 %	150 kHz ± 20 %	300 kHz ± 20 %
Sensitivity		94 ± 3 dB			93 ± 3 dB		
Sensor size (Excluding the protruded part)		Φ 20 x 26.5 mm			Φ 22 x 30 mm		
Sensor mass (Excluding equipped cable)		49 g	43 g		62 g	56 g	
Operating temperature		-20 to +80 °C					
Vibration resistance		1.0 × 10^2m/s^2 {10G} 50Hz up / down / forward / back each 2h.					
Shock resistance		5.0 × 10^3m/s^2 {500G} up / down / forward / back each 10 times.					
Material	Chassis	Stainless : SUS303			Stainless : SUS304: NBR(O-ring)		
	Receiving surface	Alumina			Stainless : SUS304		
Protection structure		IP50			IP67		
Connector		BNC			BNC Equipped with environmentally resistant robot cable (5 m)		
Max. cable length		20 m					
Extension cable		5 m, 10 m, 15 m, 20 m			5 m, 10 m, 15 m		

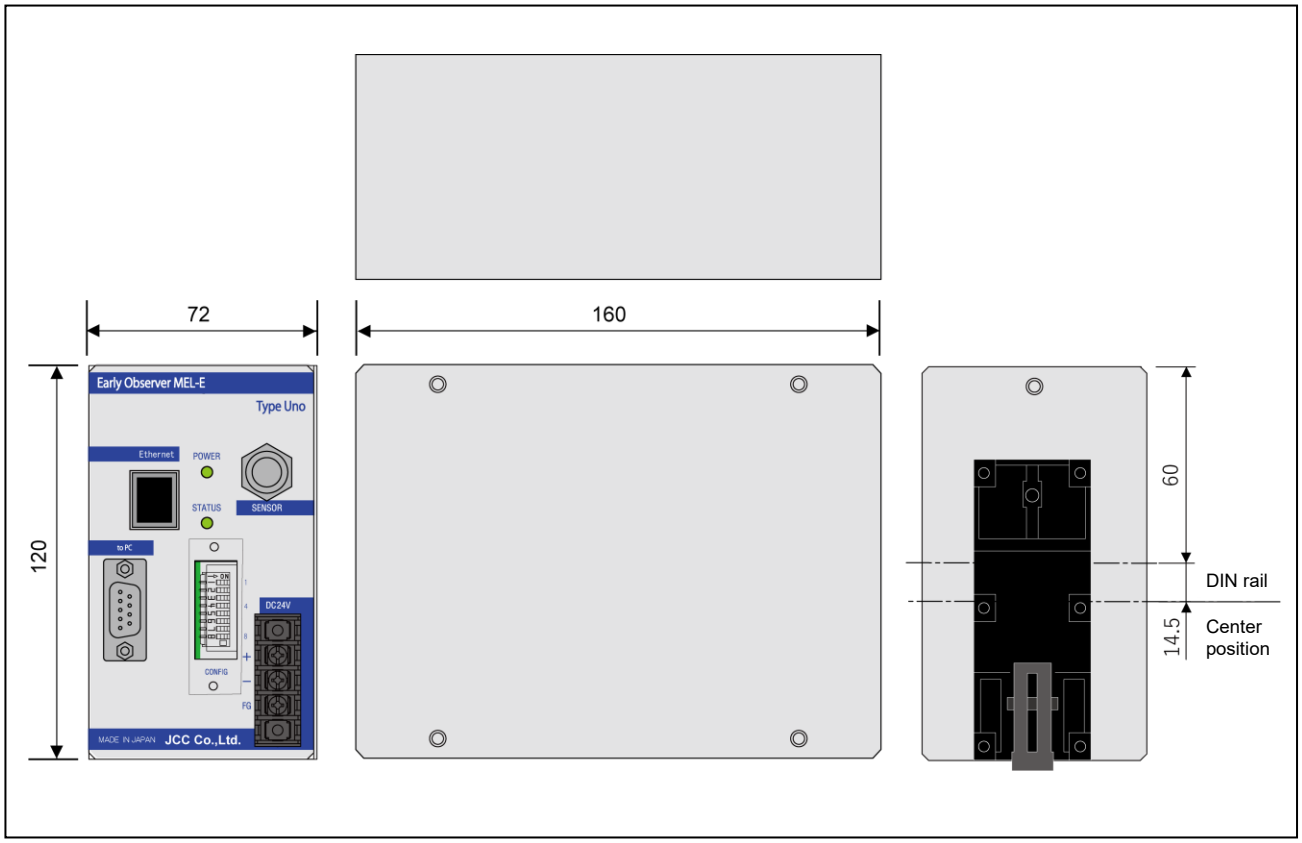
4-3. Specifications of AE sensor cable

Item	Specifications	
Model	EO-ST	EO-HRB
Type	Standard cable	Environmentally resistant robot cable
External diameter	Φ 5	Φ 4
Ambient operating temperature range	-20 to +60 °C	-253 to +200 °C
Characteristics	Low price	Superior in environmental resistance and flex resistance and usable for moving part
Insulator	Polyethylene	Fluorinated ethylene propylene
Sheath	Vinyl chloride	Fluorinated ethylene propylene (Teflon coating)
Number of cores	1 (coaxial cable)	
Color	Black	Gray

5. External view

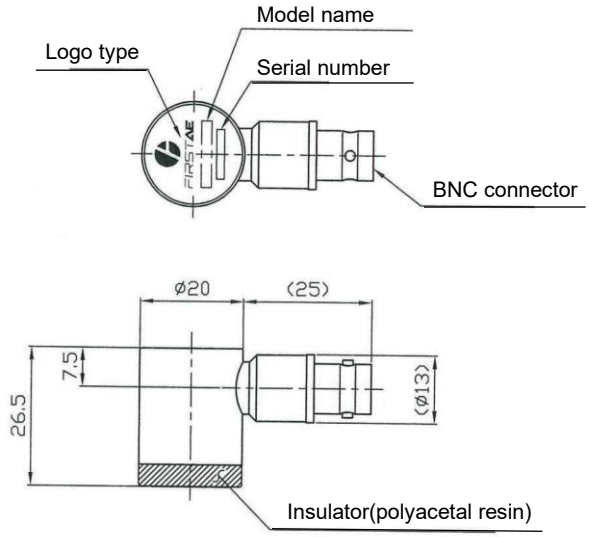
5-1. External view of AE amplifier

● EO-MEL-E-Uno-1st [mm]

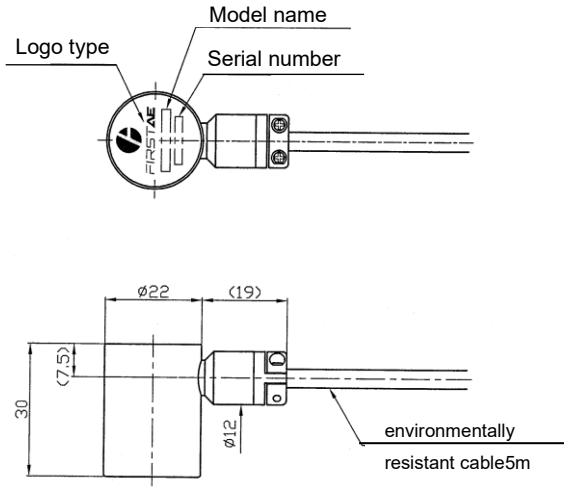


5-2. External view of AE sensor [mm]

[Standard sensor]

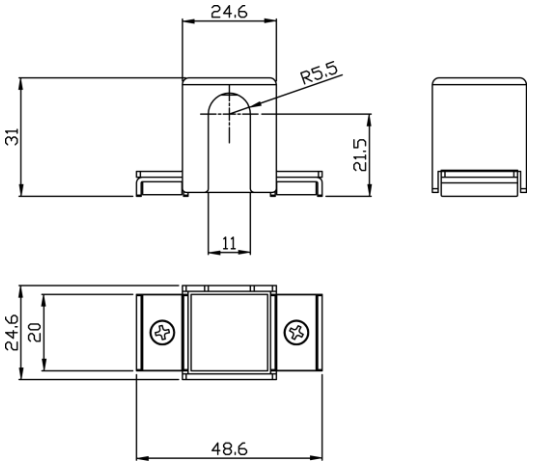


[Waterproof sensor]

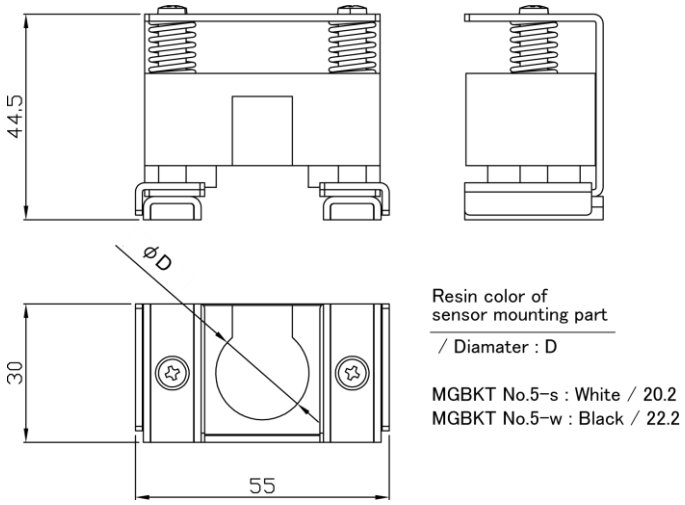


5-3. External view of sensor bracket [mm]

[MGBKT No. 2]

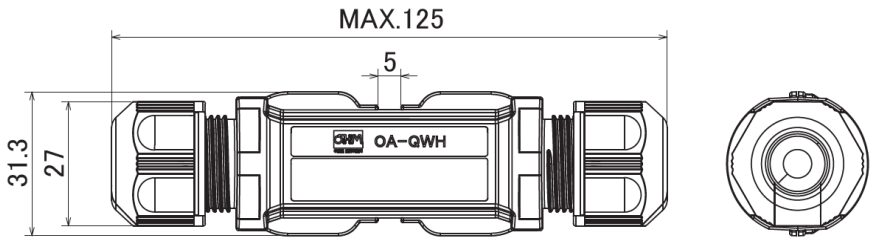


[MGBKT No.5]



5-4. External view of waterproof relay connector set [mm]

[EO-CONCT-BNC-W]



6. Functions

[List of functions]

Function	Description
AE measurement function	The data within edge process time is measured. - Amplitude-MAX [mV] : maximum amplitude value - Energy [dBs] : energy value - RMS [mV] : effective value - Counts : 0 V or number of intersection - Amplitude-dB [pieces] points of setting threshold value [dB] : decibel equivalent of the maximum amplitude value Amplitude-MAX 5,000 mV = Amplitude-dB 100 dB)
Frequency filter function	Frequency components which are not necessary for AE measurement (vibration, ultrasonic waves, etc.) can be cut off. * With LPF, the setting has been finished at shipment.
Edge process time selection function	The edge process time (transmission interval) can be changed depending on the processing capability of the sequencer or the load factor of the software. 10 ms, 20 ms, 50 ms, 100 ms, 1000 ms, and 2000 ms are selectable. * 1000ms, 2000ms is SERIAL 214 or later. (at shipment: 10 ms)
Apportioned function	When the Energy value is too large, calculate and output the Energy value proportionally. Select a large value for the edge process time (transmission interval), and when the Energy value becomes too large, calculate and output the proportional division.
Fail-safe function	Following errors are detected and transmitted by LED display and communication. - Breaking / short circuit of sensor cable - Drop in internal power voltage
Sensor signal check function	The user can confirm the reliability of the AE sensor output. - The initial AE sensor signal is memorized as a "reference value" in the amplifier. - If "sensor signal check" is executed, the AE sensor signal is measured and saved in history 1. In addition, the reference value and AE sensor signal value at 10 measurements in the past are returned. The user can confirm the reliability of the sensor by comparing the sensor signal detection levels
Clock function	Time (hour, minute, second, millisecond) is added to the measurement data. Measurement time and measurement data can be related.
Individual logging function	The individual logging can be started and stopped by dedicated software (AE SYSTEM SUPPORT TOOL) after connection to the USB port of PC with a "cable for connecting PC". With PC, the measurement data can be displayed as a graph and saved in CSV format in the memory.

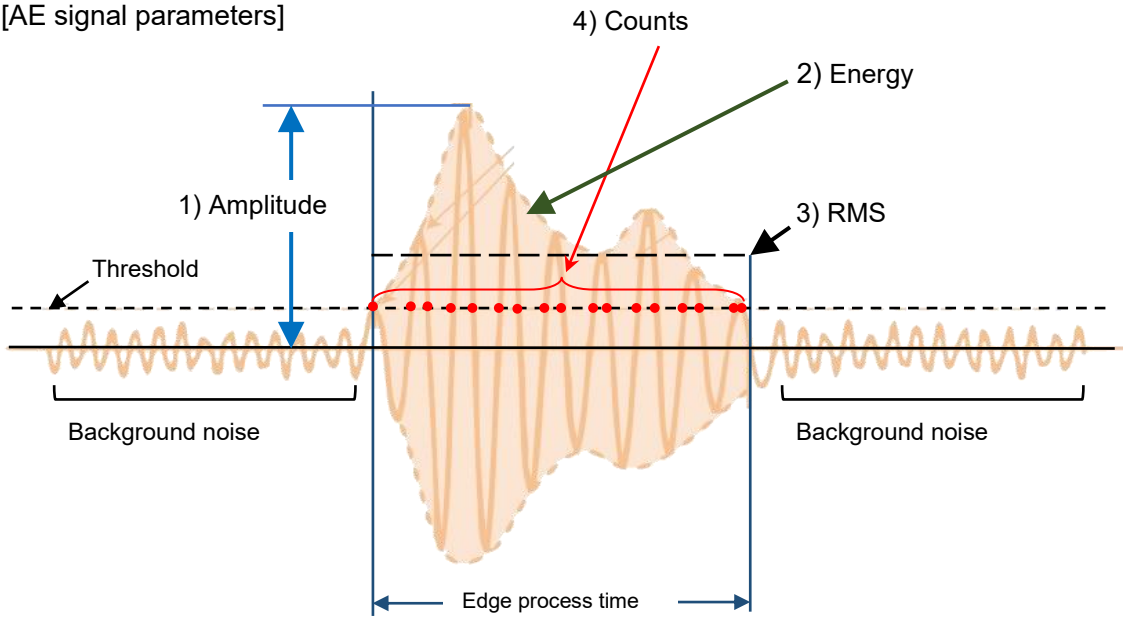
Amplitude-dB (decibel value)

Amplitude-dB is a value convenient for observing the tendency for preventive maintenance.
Though the decibel value sensitively reacts to a small change at the initial phase of maintenance, the value does not change without a large change because the logarithmic compression is executed if the value becomes large. For example, if the value exceeds 80 dB, it becomes easier for the user to determine when to perform maintenance, etc.

6-1. AE measurement function

The AE signal is converted into four parameters and measured.

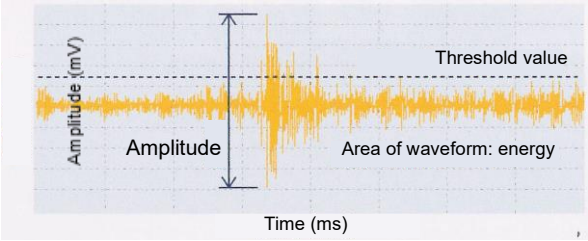
[AE signal parameters]



1) Amplitude-MAX : Max. amplitude value: Value of AE waveform within “edge process time”
2) Energy : Energy value: Integrated value of AE waveform within “edge process time”
3) RMS : Effective value: Value of AE signal acquired for each unit of “edge process time”
4) Counts : Count value: Number of intersections with OV or set threshold within "edge process time”

[AE waveform and measurement points]

Sudden type



Source of occurrence: Crack growth, material transformation, etc.

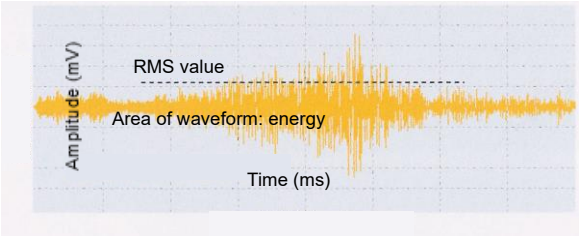
Waveform shape: Sharp rise

RMS (effective value): Correlation with Crack growth distance

Energy: Correlation with Crack growth distance

Frequency: Different characteristics for each object/material

Continuous type



Source of occurrence: Friction, wear, etc.

Waveform shape: Continuous signal

RMS (effective value): Correlation with Frictional force, Coefficient of friction

Energy: Correlation with Friction volume

Frequency: Different characteristics for each object / material

6-2. Frequency filter function

Frequency components (vibration, ultrasonic waves, etc.) that are unnecessary for AE measurement can be deleted.

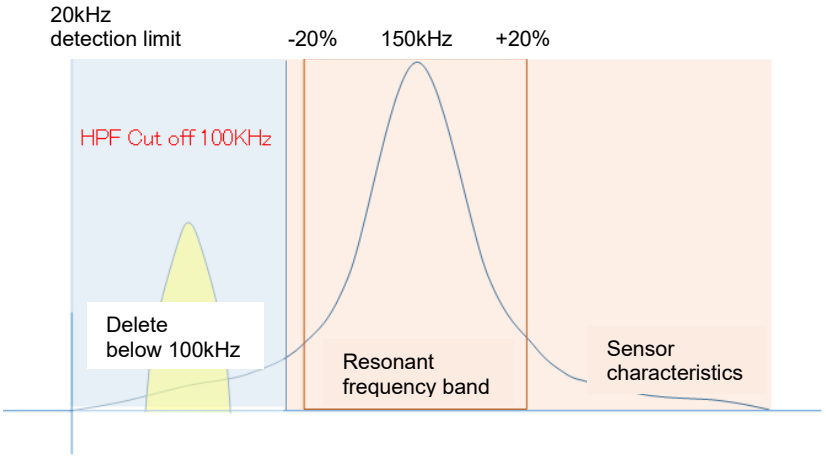
HPF: without filter, 30 kHz, 50 kHz,100 kHz, 150 kHz (-12 dB/oct)
LPF: without filter, 500 kHz, 1 MHz (-12 dB/oct)

* LPF has been set at shipment-Standard setting value 1MHz

■ Image of HPF

The frequency band not required for AE measurement is to be cut.

HPF: High Pass Filter



Set according to the sensor type.

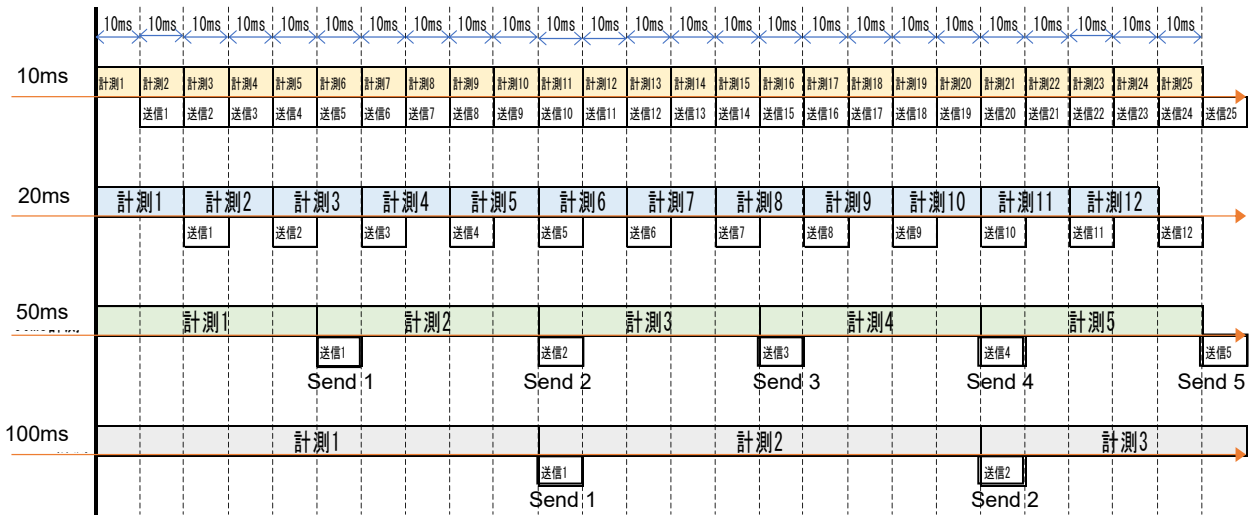
FAEN-60(W)I	HPF : 30	: for copper/aluminum
FAEN-S150(W)I	HPF : 100	: for iron/stainless
FAEN-S300(W)I	HPF : 200	: for ceramic

6-3. Edge process time selection function

The edge process time (transmission interval) can be changed depending on the processing capability of the sequencer or the load factor of the software.

10 ms, 20 ms, 50 ms, 100 ms, 1000 ms, and 2000 ms are selectable.
* 1000ms, 2000ms is SERIAL 214 or later. (at shipment: 10 ms)

[Image of transmission interval]



6-4. Apportioned function

If you set a long " Transmission interval ", the energy value may become large.
At this time, set the " Apportioned Value " and calculate and output the energy value.

Energy Value = Energy ÷ Factor of 10 of the apportioned value

Example: Energy value when the energy is 80,162,573,654 with apportioned value

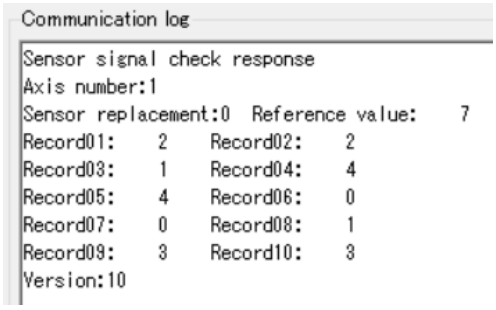
Apportioned value	Energy value
0	80,162,573,654
1	8,016,257,365
2	801,625,737
3	80,162,574
4	8,016,257
5	801,626
6	80,162
7	8,016
8	802
9	80

6-5. Sensor signal check function

The user can confirm the reliability of the AE sensor output.

- The initial AE sensor signal is memorized as a "reference value" in the amplifier.
- If "sensor signal check" is executed, the AE sensor signal is measured and saved in history 1. In addition, the reference value and AE sensor signal value at 10 measurements in the past are returned.

[Sensor signal check execution example]



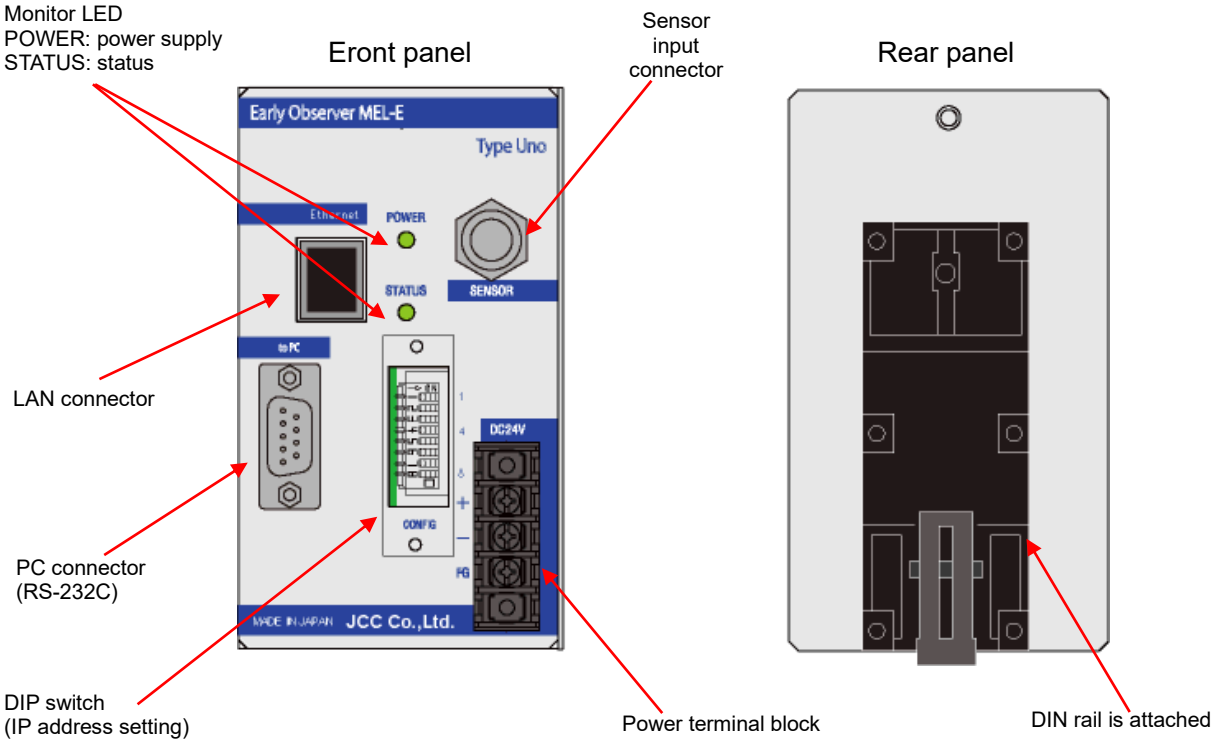
* History 01 shows the latest data.

Tips

- When an abnormality occurs in the sensor characteristics that affects the results of AE measurement, the sensor signal changes by more than two times.
- Monitor reliability visually or by connecting to a host controller.

7. Name of each part

Name of each part of Early Observer MEL-E Type Uno 1st



(1) Power terminal block (M3)
+, - : Supplies 24 DCV.
FG : class-D grounding (ground resistance of 100 Ω or less).

(2) Sensor input connector
Connects the AE sensor.

(3) LAN connector
Connects the Ethernet interface unit of the sequencer.
Yellow LED(top) :Link(lit), No link(off), Activity(blinking)
Orange LED (bottom) :100Base-EX conection(lit), 10Base-TX connection(off)

(4) PC connector (RS-232C)
When connected to the USB port of PC with a "cable for connecting PC", measurement values can be displayed as a graph and recorded as data by setting MEL-E and individual logging using the dedicated software.

(5) DIP switch
Switches the last place of the IP address (not used by this machine).

(6) Monitor LED
POWER: Lights up when the power is supplied
When turning on the power (lights up in green) -> at startup (lights up in orange) -> startup complete (lights up in green)
STATUS: Displays the status of the device

During standby	: off
During measurement	: lighting in green
Breaking / short circuit of sensor cable	: flashing in red (about 2sec. intervals)
Voltage drop of internal power supply is detected	: lighting in red

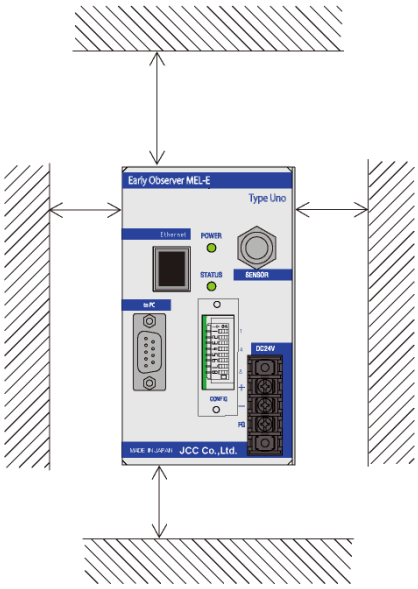
8. Attachment method and precautions

8-1. How to attach AE amplifier and precautions

(1) Installation location

Avoid installation at the following places.

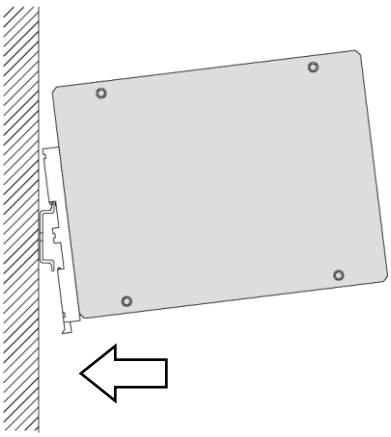
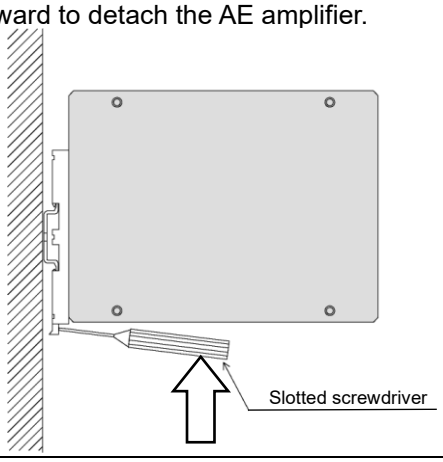
1) Place exposed to direct sunlight
2) Place where the ambient temperature exceeds the range -10 to +55 °C
3) Place where the ambient humidity exceeds the range 20 to 80 %RH
4) Place where there is a risk of dew condensation or a place where the humidity is high, and the temperature sharply changes
5) Dusty place
6) Place where there is much salt content or iron content
7) Place where there is combustible gas / corrosive gas
8) Place where there is a droplet of water, oil, chemicals, etc.
9) Place with vibration or impact



(2) Cautions on attachment

1) Attach the device in the control panel.
2) Install the device separately from a high-voltage line and power line as much as possible to prevent the effect of noise.
3) Attach the AE amplifier to the 35 mm DIN rail.
4) Attach the AE amplifier vertically.
5) Ensure free space around the AE amplifier.
6) Do not place anything on the AE amplifier.

(3) Attachment and detachment of converter

Attachment	Detachment
Hitch the hook on the bottom surface of the AE amplifier to the DIN rail and push it to fix. 	Push down the white hook on the bottom surface of the AE amplifier using a slotted screwdriver or other item and pull the lower part forward to detach the AE amplifier. 

8-2. How to attach AE sensor and precautions

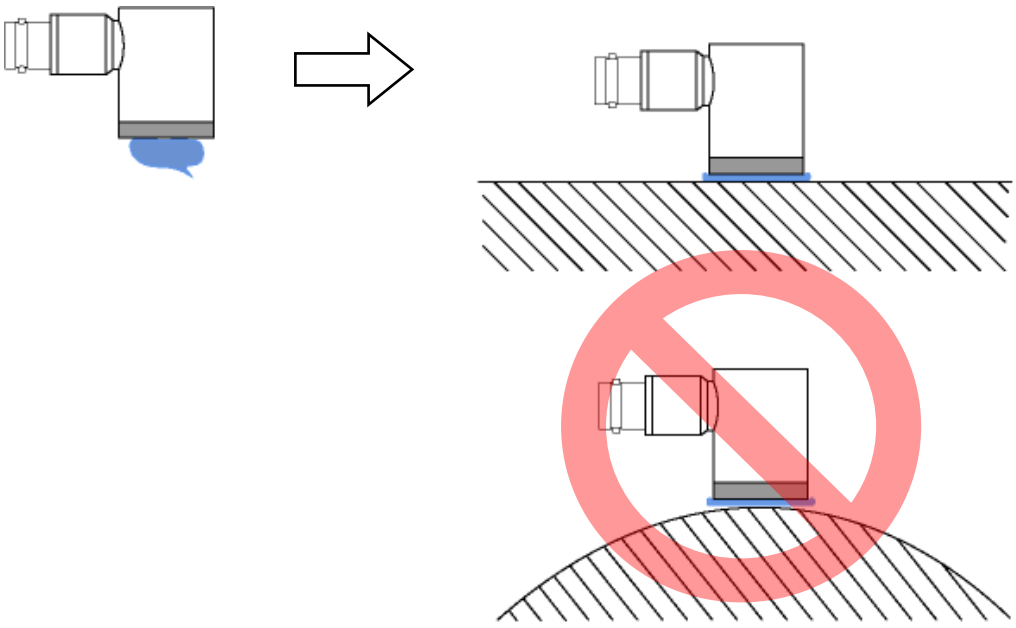
(1) Place to attach the AE sensor

Avoid installation at the following places.

1) Place where the ambient temperature exceeds the range -20 to +80 °C.
   If the ambient temperature exceeds the range shown above, control the temperature range using a stethoscopic rod or other tools.
2) Place where there is a droplet of water, oil, chemicals, etc.
   At a place where there is a droplet, use a waterproof AE sensor.

(2) Cautions on the attachment of the AE sensor

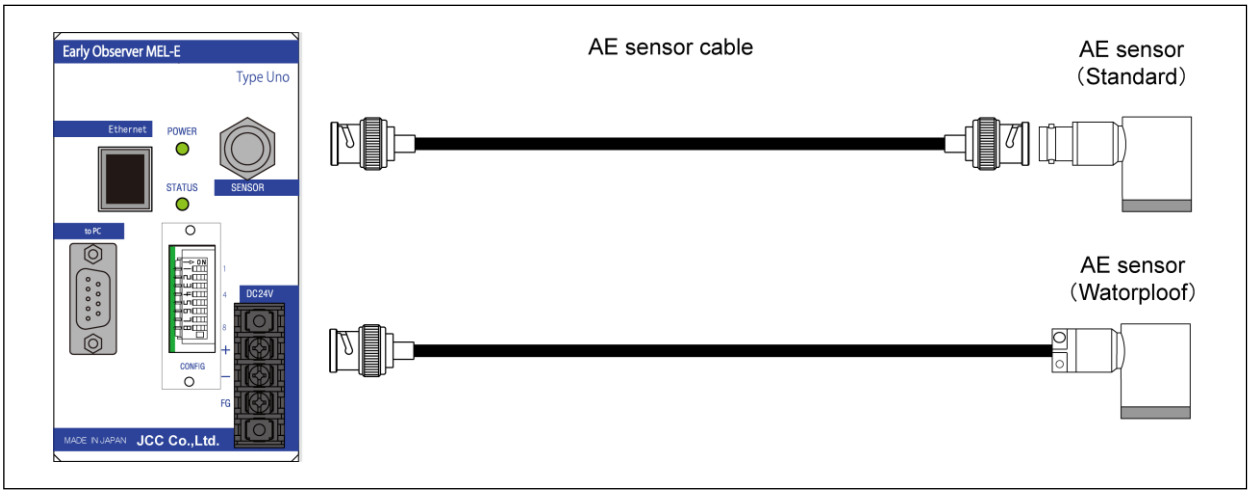
1) Attach the AE sensor on a flat surface as much as possible.
2) Before attaching the AE sensor, apply grease of vaseline on the contact surface of the AE sensor sufficiently not to generate a gap between the contact surface of the AE sensor and the measurement surface.
   ● Recommended grease: Shin-Etsu Chemical Co., Ltd. HIVAC-G



3) Fix the AE sensor using the dedicated sensor bracket.
4) When attaching the AE sensor to a non-magnetic material such as aluminum or stainless, fix the AE sensor with a tape or directly apply the adhesive agent such as "hot melt" on the contact surface of the AE sensor to fix it.
5) Install the AE sensor separately from a high-voltage line and power line as much as possible to prevent the effect of noise.

9. Wiring and connection

9-1. Wiring of AE sensor



* When relaying the AE sensor cable, the metallic part of the BNC connector should not contact the equipment. For the relay of the AE sensor cable, the use of a "waterproof relay connector set" is recommended.

Waterproof relay connector set: EO-CONCT-BNC-W

[Cautions on relaying AE sensor cable]

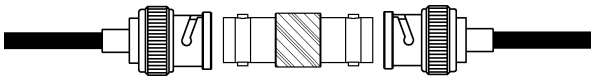
If the metallic part of the BNC connector contacts the equipment, the metallic parts may contact each other to generate AE waves.

For the relay of the AE sensor cable, the use of a "waterproof relay connector set" is recommended.

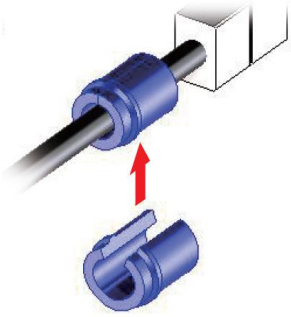
9-2. Relay and extension of AE sensor cable

■ Work procedure of waterproof relay connector set　　Model: EO-CONCT-BNC-W

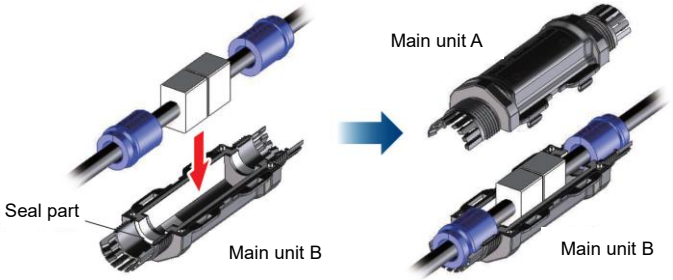
1) Connect the BNC connectors with a relay connector of "waterproof relay connector set".

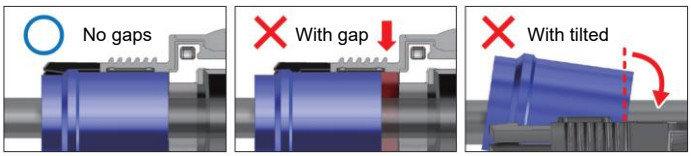


2) Open up the slit part of the rubber bush and cover the cable.



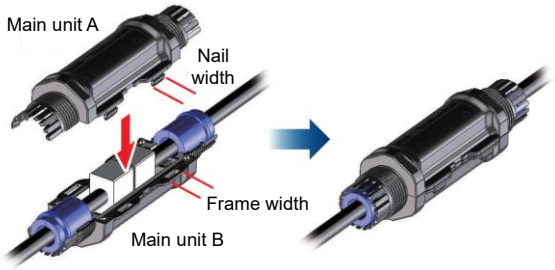
3) Embed the relay part and rubber bush into the main unit B. At this time, the edge surface of the rubber bush should contact the seal part (white) of main unit B without a gap, and it should not be tilted inward.





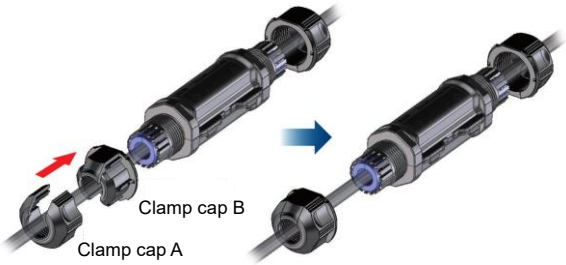
[Caution]
If the rubber bush is tilted inward, it interferes with the seal part of main unit A and it cannot be locked, so the watertightness gets damaged.

4) Check the orientation with nail width at the lock part of main unit A and frame width at the lock part of main unit B and embed the main unit A.



[Caution]
Embed the main unit A not to get the edge surface of rubber bush caught in the seal part (white) of main unit A.
Check the nail at the lock part is caught in the frame.

5) Assemble tightening caps A and B along the cable.



6) Tighten the tightening cap to fix the cable.



10. AE measurement by sequencer

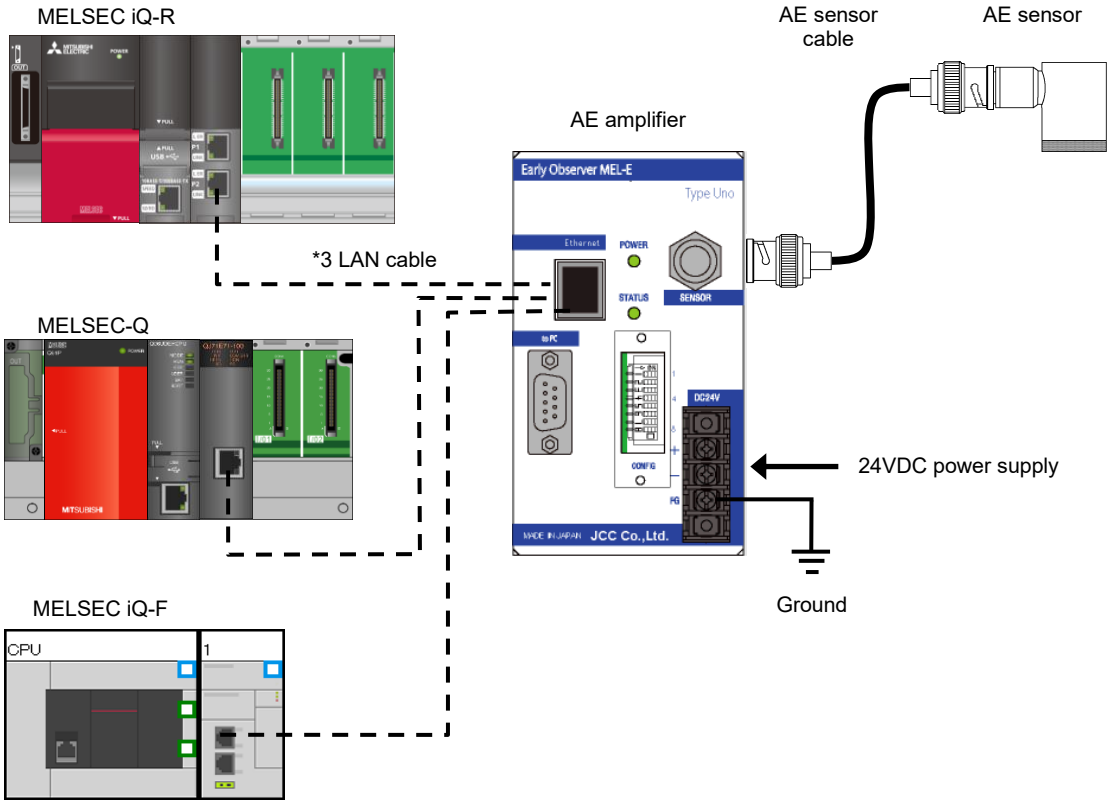
For the AE measurement from the sequencer (PLC), connect MEL-E and Ethernet unit of the sequencer with a LAN cable.

For the communication of AE measurement data, FB for communication is programmed for the sequencer.

* For how to program FB, refer to "Software Manual for Connecting MELSEC iQ-R/Q".

10-1. Connection of sequencer

■ Configuration of equipment



Item	Specifications
Recommended Ethernet interface unit	Ethernet interface unit made by Mitsubishi Electric Corporation MELSEC iQ-R : RJ71EN71, RnENCPU (Port1) MELSEC-Q *1 : QJ71E71-100 MELSEC iQ-F : FX5-ENET *2 Simultaneous measurement by connecting multiple units via HUB, etc. is not covered by the warranty.

*1. With the MELSEC-Q series, software for MELSEC communication can be installed on CPU shown below.
- First 5 digits of QnUDVCPU / QnUDVPCPU serial number are "19012" or later.

*2. Please use firmware version “1.101” or later for the FX5-ENET unit.

*3. For the LAN cable, a "shielded LAN cable" with a high shielding effect is recommended. Both of straight and cross types of LAN cables are usable.

10-2. Procedure of AE measurement from sequencer

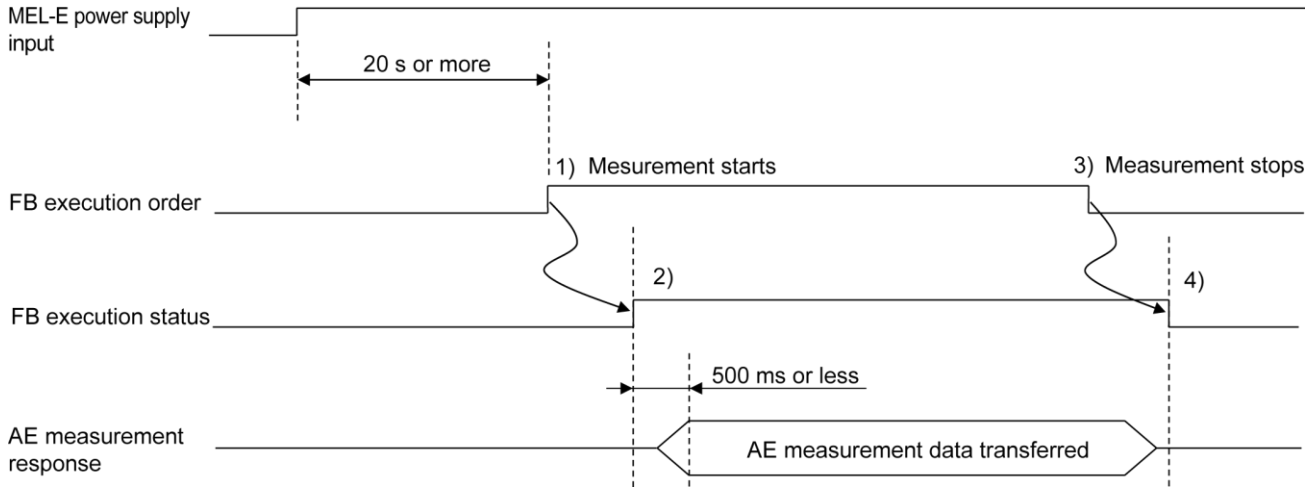
Carry out the AE measurement from the sequencer (PLC) in the following procedure.

* For how to program FB, refer to "Software Manual for Connecting MELSEC iQ-R/Q/iQ-F".

Here is the procedure of AE measurement from the sequencer (PLC).

1) Turn on the "execution order" of AE measurement FB.
2) Receive the AE measurement data.
3) Turn off the "execution order" of AE measurement FB.
4) Check the "execution status" of AE measurement FB is off.

(The sequence of AE measurement is terminated)



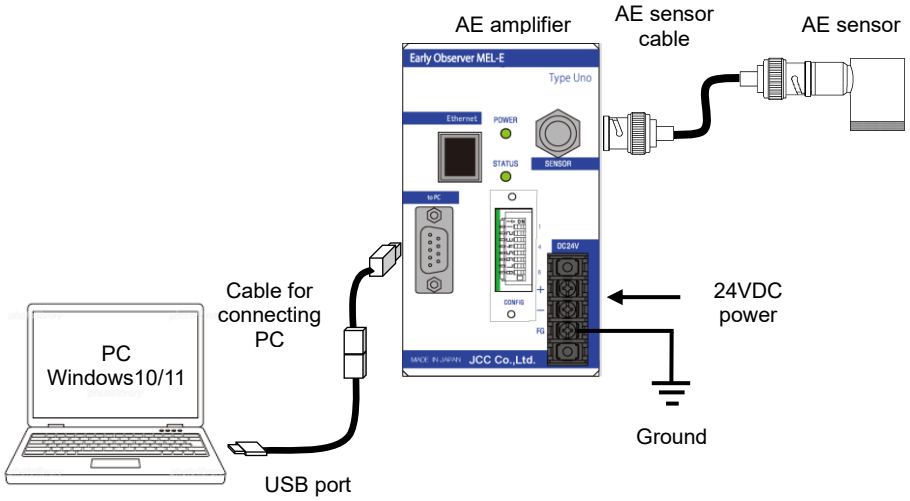
CAUTION

Execute the AE measurement after 20 seconds or later after turning on the power supply of MEL-E. (Activation of MEL-E is complete [POWER LED: lights up in green] after 20 seconds or later after turning on the power supply.)

11. AE measurement by PC

Connect MEL-E and the USB port of PC with a "cable for connecting PC". The AE measurement can be executed by the dedicated software (AE SYSTEM SUPPORT TOOL).
The measurement data can be displayed as a graph on the PC display and saved in CSV format in the memory of PC.

■ Configuration of equipment



For how to operate the dedicated software (AE SYSTEM SUPPORT TOOL), refer to the user's manual.

[Cautions on AE measurement by PC]

-If the AE measurement is performed by connecting the USB port of PC with a "cable for connecting PC", the Ethernet communication between MEL-E and the sequencer will be blocked.
-To restart the Ethernet communication between MEL-E and the sequencer, turn off and on the power supply of MEL-E.
-AE measurement on a PC largely depends on the PC specifications.
Please use it for short-term measurements (approximately within 1 hour).
Use a sequencer (PLC) to perform continuous measurement over a long period of time when the AE measurement time exceeds 1 hour.

■ USB driver is required for the cable for connecting PC

When using the cable for connecting PC for the first time, connect the "cable for connecting PC" to the PC in the environment where Windows Update can be executed through the Internet.
The USB driver for the "cable for connecting PC" will be automatically installed.

* If the USB driver cannot be installed, download the driver from the website shown below, and then install it.
https://www.buffalo.jp/download/software/
Model number: BSUSRC06SV

* It is necessary to install the USB driver only when the cable for connecting PC is connected for the first time.
For the second connection or later, it is not necessary to install the USB driver.

12. WARRANTY PERIOD AND SCOPE

The products described in this document are not intended for applications (such as medical equipment, vehicles, aircraft/spacecraft, and nuclear equipment control) that require extremely high reliability. If the customer considers using the products for such applications, please consult JCC's sales representative in advance.
Although JCC endeavors to improve the quality and reliability of our products, electronic devices in general are not free from malfunctions or failure. When wishing to apply our products to customer's equipment or system, the customer is responsible for ensuring the thoroughly safe design of the equipment or the system so that malfunctions or failure of our products will not cause any loss of human life, injuries, or loss of property.

The warranty period of the delivered product is one year from the date of delivery.
In the event of a breakdown of the product during the above-mentioned warranty period due to our fault, we will repair or replace the returned product free of charge.
However, the breakdown caused by any of the following is not covered by this warranty.

1. Use or handling in an inappropriate condition or environment
2. Other than the delivered product
3. Unauthorized modification or repair by other than JCC
4. Matters not due to our fault, such as Acts of God or natural disaster
5. Matters or phenomena that couldn't be predicted by the technologies and techniques that were available at the time of delivery of the product

The warranty referred to herein means the warranty on the delivered product alone and does not cover any damages incurred by the breakdown of the delivered product. The specifications, operating instructions, and other descriptions in this document are subject to change without prior notice for improvement and other purposes. The price of the delivered product does not include any fees for dispatching engineers and other servicing.
The following cases are separately charged.

1. Assistance in installation, adjustment, and trial operation
2. Maintenance inspection, adjustment, and repair
3. Technical assistance, etc.



* This product is a data logging system adopting the AE sensor as a key technology, which does not guarantee machine failure sign diagnosis result or quality control.

■ **Contact**

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