

ELECTRONIC MULTI-MEASURING INSTRUMENTS



SS

Super-S Series

Results of Pursuing Operation Ease and Viewing Clarity

ME110 Super-S Series Electronic Multi-measuring Instruments

Inspired by the excellent reputation of the popular New-S (NS) Series products introduced in 2006, Mitsubishi Electric is delighted to introduce its all-new Super-S (SS) Series electronic multi-measuring instruments developed in the pursuit of enhanced operation ease and viewing clarity.

This new series features a liquid-crystal display (LCD) screen that integrates the top and bottom tiers, clear easy-to-read text/characters, and compatibility with NS Series applications in terms of both functions and installation.

The innovative design of the SS Series is supporting the realization of energy-saving measurement monitoring systems that are easy to use and read.

ME110 Super-S

5 Advantages

Enhanced Viewing Clarity

● Wide-angle-view LCD

Wide-angle-view LCD with top and bottom tiers integrated for total freedom in installation.

Crystal-clear display makes text even easier to read when viewed from the front.

● High-brightness Backlight

A high-brightness LED is incorporated for improved illumination.

Communication

● Communication Functions to Support Open Networks

CC-Link communication

ModBus communication

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Monitoring

● **Highly precise monitoring functions using our dedicated ASIC**

Upper/lower limit monitoring of up to four items
Harmonics monitoring
Measuring of import/export active energy

Abundant Functions

● **Motor Start-up Current Masking**

Prevents maximum-value updates and alarm outputs caused by motor start-up current.

● **Contact Input (Digital Input)**

Equipped with a digital input terminal (transmission) function, enabling transmission at five points via B/NET transmission.

Support for Wiring Checks

● **Misconnected Wiring Detection**

Support for detecting misconnected wires by displaying voltage/current phase angles.

● **Test Function**

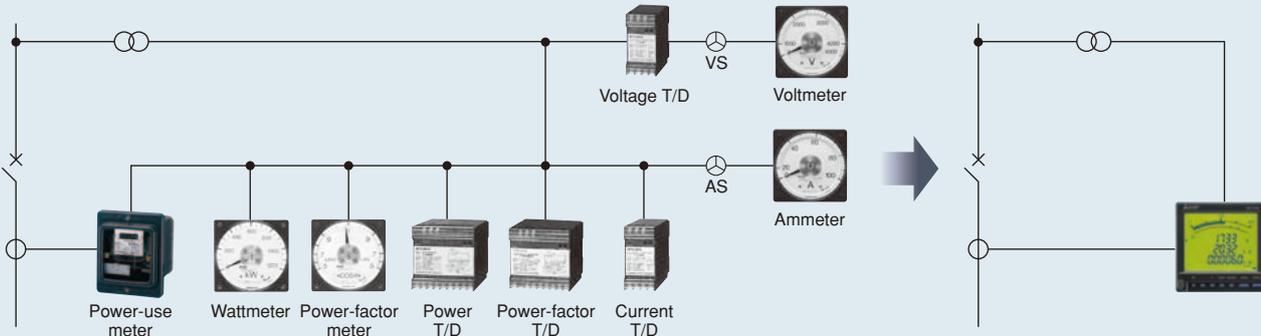
Outputs a test signal when an auxiliary power source is applied (input voltage/current not needed) (alarm circuit, analog output, pulse output, communication function).



ME110 Super-S Series Features

High Cost Efficiency

- Save space and reduce connection wires



Crystal-clear Display

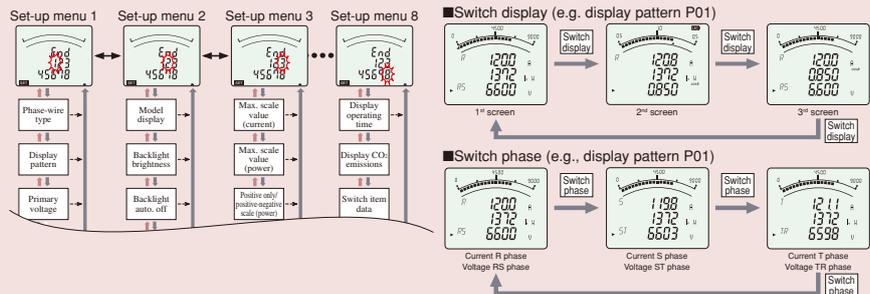


- Guideline indicator
- Bar graph: Power factor
- Top tier: Current
- Middle tier: Voltage
- Bottom tier: Power use

- Top, middle and bottom tiers in the digital display are all the same size.
- The positions of items measured can be changed freely between the top, middle and bottom tiers.
- Function for adjusting LCD contrast and backlight brightness added (optional).
- Freedom to select items displayed (P00).
- Items can be set to be displayed in a repeating cycle.

Simple Settings, Simple Operations

- Possible to set items such as phase-wire type and primary voltage/current.
- Maximum scale value can be set according to primary current/voltage.
- Switch display and switch phase buttons can be used to easily change between screens and view desired items.



Product Line-up

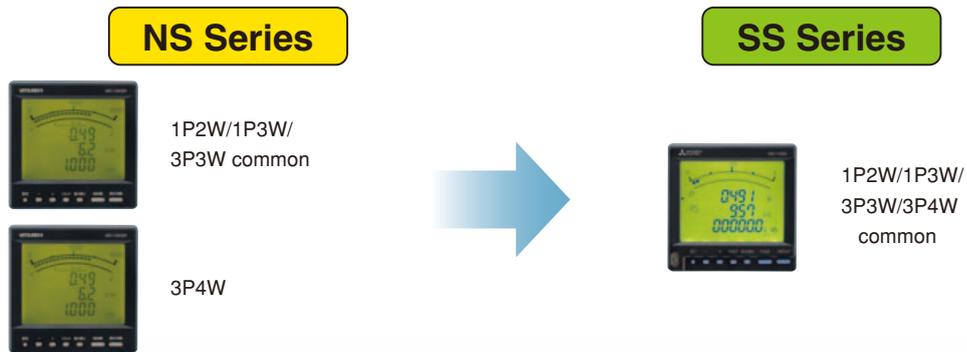
Model name	Measurement items	Phase-wire type	Output/Communication functions				Input
			1P2W/1P3W/ 3P3W/3P4W	Analog output	Pulse output	Alarm output	
ME110SSR	A × 3 DA × 3 V × 3 W, DW cos φ var, Hz Wh, varh HI, HV	○	—	—	—	—	—
ME110SSR-4A2P		○	○ (4 circuits)	○ (2 points)	—	—	—
ME110SSR-4AP NEW		○	○ (4 circuits)	○ (1 point)	—	—	—
ME110SSR-4APH		○	○ (4 circuits)	○ (1 point)	○ (1 point)	—	—
ME110SSR-C		○	—	—	—	—	CC-Link
ME110SSR-CH NEW		○	—	—	—	○ (1 point)	CC-Link
ME110SSR-MB		○	—	—	—	—	ModBus



Shared Functions

Shared Functions

The previous NS Series is divided into two models based on phase-wire type. However, the new SS Series **integrates everything into a single model**, simplifying model selection and inventory management.



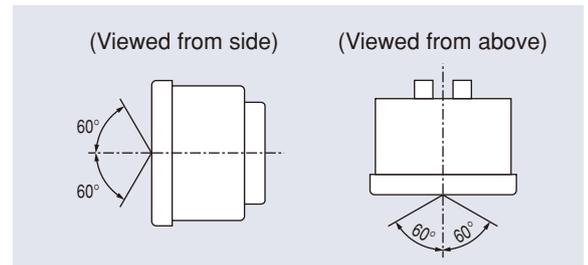
Enhanced Viewing Clarity

Wide-angle-view LCD

- Built-in wide-angle-view LCD for total freedom in installation position. Easier to read when viewed from the front.
- Previously used exclusively for bottom-tier mounting; however, top and bottom-tier specifications are now shared, simplifying model selection.

New/ Previous	Series name	Viewed from side		Viewed from above	
		Up	Down	Left	Right
New model	ME110SS	60°	60°	60°	60°
Previous model	ME110NS	10°	60°	60°	60°

*Viewing-angle values for the NS Series apply to the standard model (top-tier specifications).



High-brightness Backlight

- Highly reliable, high-brightness backlight incorporated.
- Backlight brightness can be adjusted between levels 1~5 (3 is the default).
- The backlight has two modes, always-on and automatic-off (always-on is the default).



ME110NSR



ME110SSR



Support for Wiring Checks

Support Function for Detecting Misconnected Wires

- Support for detecting misconnected wires is provided by displaying current/voltage phase angles (one-side as standard for voltage), phase power values (W1, W3), and current/voltage values. The function checks for abnormal current/voltage phase angles by comparisons with normal values, making it easier to specify the location of misconnected wires.

*This function only works in the value setting confirmation mode; the items stated above are not displayed during normal operation.

Example: Three-phase, three-wire; power factor: 1.0

Displays phase angle (current) in the case of balanced load



Normal operation



P1, P2 terminal connection reversed

	Top tier	Bottom tier
	Between VRS and IR	Between VRS and IT
Normal operation	∠ 30°	∠ 270°
Misconnected wire	∠ 210°	∠ 90°

ME110 Super-S Series Features

(1) Alarm Circuit Test

① Displays present alarm contact status

Status	Display	Between output terminal A-COM
Alarm activated	ON	Closed
Alarm not activated	OFF	Open

② Each time the reset button is pushed for two seconds, the display and contact will be reversed, regardless of whether or not the alarm is activated.



(2) Analog Output Test

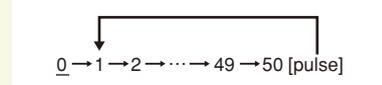
Confirms the corresponding CH test.

Output	Output specifications		
	4-20mA	1-5V	0-5V
0%	4mA	1.00V	0.00V
25%	8mA	2.00V	1.25V
50%	12mA	3.00V	2.50V
75%	16mA	4.00V	3.75V
100%	20mA	5.00V	5.00V



(3) Pulse Output Test

Push the reset button once for a single-pulse output.



*When the output pulse count reaches 50, the display restarts from 1.

(4) Communication Function Test

① Display screen

- In the same manner as the operating mode, items are displayed when making settings such as those for the display pattern.
- Maximum and minimum values can be displayed.



② Values monitored during communication

- The measurement elements (items displayed on the screen) are monitored values. The measurement elements not displayed on the screen are 0 (zero).
- In the case of using an external switch with contact input, the presently set input status can be monitored.

Test Function

- The ME110NS Series is only equipped with the alarm circuit test mode. However, for the ME110SS Series, analog output, pulse output and communication function wiring check test functions have been newly introduced.
 - At the time of counter-testing onsite to check the system and checking wiring at the time of shipment, when the auxiliary power source is applied, a test signal can be output.
- *Items other than analog output, pulse output and the communication function are not displayed on the set-up screen.

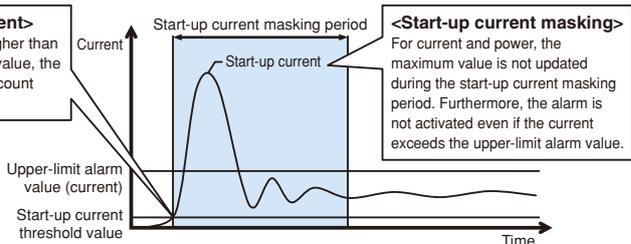
Abundant Functions

Motor Start-up Current Masking

This function monitors motor current, and is used to prevent maximum-value updates and alarm outputs caused by motor start-up current. Note that although the maximum value is not updated, the present value is displayed.

<Detecting start-up current>
When the current becomes higher than the start-up current threshold value, the start-up current masking time count starts.

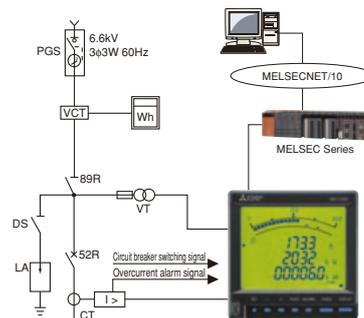
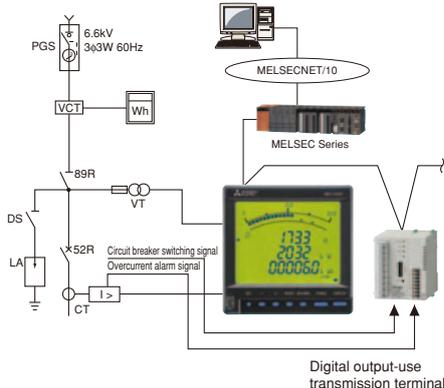
Supplementary explanation: When setting the start-up current threshold value, consider load current fluctuations during operation and set it at a value lower than the lower-limit value.



Contact Input Function

By setting the external switch terminal as the external contact input, the circuit breaker switching signal and overcurrent relay alarm signal are connected, and the contact status can be displayed. A model with a communication function, three-point contact input and one alarm has been newly added to the line-up. In addition, for B/NET transmission models, three-point digital input is provided, allowing monitoring of contact status by inputting the alarm contact output to the main unit and transmitting it to the central device.

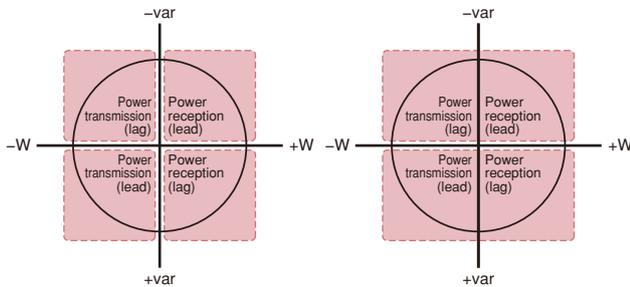
Model name	Alarm output point	Contact input (SA, ZA)	Digital input (DI)	Communication compatibility
ME110SSR-CH	1 point	2 points	3 points	CC-Link
ME110SSR-C	-	2 points	-	CC-Link
ME110SSR-MB	-	2 points	-	ModBus



Capacitor Panel Compatibility

- Using the reactive power meter, two-quadrant and four-quadrant measurements are possible.
- A bar graph with only lagging reactive power can be displayed.

<Four-quadrant measurement> <Two-quadrant measurement>



Measurement method	Explanation
Four-quadrant measurement	Leading power reception/transmission and lagging power reception/transmission are each measured as single segments. This is suitable for sites that use in-house power generation. However, due to dead regions that are generated at the boundary of each segment, reactive energy cannot be measured close to a power factor of one or zero.
Two-quadrant measurement	Lagging power reception/leading power transmission, and leading power reception/lagging power transmission are measured as single segments. As a result, there is no dead region close to the power factor of zero, and reactive power can be measured. This is suitable for sites that do not use in-house power generation, and for measuring reactive power where the power factor for the capacitor load is generally close to zero.

Abundant Alarm Display Functions

- Flashing backlight at time of alarm added.**
The backlight of the new model can be set to flash to indicate an alarm, an improvement over previous models that use a flashing-screen alarm.
- As with previous models, there is a choice of automatic or manual alarm recovery.
- As with previous models, up to four upper/lower-limit values can be monitored.

*For the ME110SSR-4APH and ME110SSF-CH models (with contact output), batch contact output is possible.



Operating Time, CO₂ Conversion Function

- Operating time load can now be measured.

When setting the operating time display, the current measurement time is cumulative and the load for operating time is displayed.

*The operating time is cumulative when the measurement value for current phase R is not zero.



Operating time

- CO₂ emissions conversion function added

When setting the CO₂ emissions display, the CO₂ emissions converted from power consumption (reception) are displayed.

*CO₂ emissions are to be calculated as follows: CO₂ emissions = Power use (reception) × CO₂ conversion ratio setting value. As this is not a cumulative value, when the CO₂ conversion ratio setting is changed, the CO₂ emissions value changes as well.



CO₂ emissions

Compatibility with Specific Primary Current/Voltage and Specific Secondary Voltage

- Specific primary current can now be set.

Use in various operating environments is possible.

When the primary current is set to SP.A:

5A~30kA

<10A: set upper two digits
≥10A: set upper three digits



- Expanded setting range for specific primary voltage.

Can be set between 60V and 750kV.

When the primary voltage is set to SP.V:

60V~750kV

<100V: set upper two digits
≥100V: set upper three digits



- Rated secondary voltage can now be set.

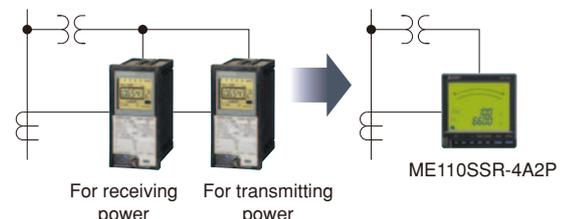
The following VT secondary-side voltages can now be measured.

/100V/110V/220V



Abundant Options for Displaying Power Consumption/Reactive Power Consumption

- Power consumption and reactive power consumption measurements can be divided into two and four categories, respectively.
Power consumption: power reception/transmission
Reactive power consumption: leading/lagging power reception/transmission
- Both types of power consumption (reception and transmission) can be displayed simultaneously.
- A model capable of pulse output at two points has been added to the line-up. Same element: one point; Different elements: one point each





ME110SSR

- Circuit alternating current, alternating current voltage, power, reactive power, power factor, frequency, power use, reactive power use, and high-frequency voltage/current measurements can be displayed.
- The line-up includes an analog model with four circuits, single-pulse and single alarm output functions, an analog model with a two-pulse output function, and an analog model with four circuits and a single output pulse function.

Specifications

Model		Multi-measuring instruments			
Model name		ME110SSR	ME110SSR-4AP	ME110SSR-4A2P	ME110SSR-4APH
Phase-wire type		1P2W/1P3W/3P3W (2CT), 3P3W (3CT) /3P4W (common)			
Measurement display item and class	Alternating current	Instantaneous value (class: 0.5)	1P2W/1P3W/3P3W : ●×3 (1, 2, 3)		3P4W : ●×5 (1, 2, 3, N, AVG)
		Demand (class: 0.5)	1P2W/1P3W/3P3W : ●×3 (1, 2, 3)		3P4W : ●×5 (1, 2, 3, N, AVG)
	Alternating voltage (class: 0.5)	Instantaneous value (class: 0.5)	1P2W/1P3W/3P3W : ●×3 (12, 23, 31)		3P4W : ●×4 (12, 23, 31, AVG)
		Demand (class: 0.5)*1	1P2W/1P3W/3P3W : ●		3P4W : ●×4 (Σ, 1, 2, 3)
	Power	Apparent power (class: 0.5)	3P4W only : ●×4 (Σ, 1, 2, 3)		
		Reactive power (class: 0.5)	1P2W/1P3W/3P3W : ●		3P4W : ●×4 (Σ, 1, 2, 3)
	Power factor (class: 2.0)	Power factor (class: 2.0)	1P2W/1P3W/3P3W : ●		3P4W : ●×4 (Σ, 1, 2, 3)
		Frequency (class: 0.5)	●		
	Power consumption (class: normal)	Reactive power consumption	○		
	High-frequency current (class: 2.5)	High-frequency voltage (class: 2.5)	○ (THD, h1...h13)		
	Instrument rating	Rated voltage	1P2W/1P3W/3P3W : 110/220V 50-60Hz (1P3W: 220V only)		3P4W : 63.5/110V-277/480V 50-60Hz
		Rated current	AC 5A or AC 1A		*AC 1A is a special product (please specify when ordering)
	Settings	Possible range for settings	● Voltage Three-phase, three-wire; single-phase, two-wire For direct connection: 150V (110V), 300V (220V) When using VT: 60V-750kV (<100V: set upper two digits) (≥100V: set upper three digits)	Single-phase, three-wire For direct connection: 300V (220V)	Three-phase, four-wire Direct connection: 277V/480V (max.) When using VT: 60V-750kV (<100V: set upper two digits) (≥100V: set upper three digits)
*When using VT, it is possible to choose 100, 110 or 220V for the instrument rated voltage.					
Alarm settings	Upper-limit setting	A, DA, V, W, DW, cosφ, var, Hz, HI, HV			
	Lower-limit setting	A, DA, V, W, DW, cosφ, var, Hz			
	Setting precision	±1.0%			
Construction (VA)	External switch	Choice of two from switch display, switch phase, reset, max./min., and external contact input			
	Input circuit	Voltage circuit: Each phase 0.1VA (110VAC), 0.2VA (220VAC) Current circuit: Each phase 0.1VA			
	External switching circuit	Each phase 0.2VA (110VAC), 0.5VA (220VAC) 0.2W (100VDC)			
Output functions	Auxiliary power source	8VA (110VAC), 9VA (220VAC), 6W (100VDC)			
	Analog output	—	○ (four circuits)	○ (four circuits)	○ (four circuits)
	Pulse output	—	○ (one point)	○ (two points)	○ (one point)
	Alarm output	—	—	—	○ (one point)
	Expansion output	—	—	—	—
Power outage compensation		Recorded in nonvolatile memory (set-up value, max./min. values, power consumption, reactive power consumption)			
Auxiliary power source		100-240VAC ^{+10%} _{-15%} 50-60Hz/75-140VDC (dual use)			
Weight		0.5kg			

- Note: *1 The power demand value is calculated based on thermo-motive models; it is not the average power for 30 minutes.
- References: 1 Classes for current, power and reactive power are standard maximum-scale values.
 2 When the input voltage is 11V or lower, the items relating to voltage are displayed as follows. However, note that current measurements are displayed even when there is no voltage input.
 • Voltage, power, reactive power: Displayed as 0.
 • Power factor: Displayed as 1.
 • Frequency, high-frequency current/voltage: Displayed as ----.
 3 If a power factor of 0 is measured for reactive power consumption, use the two-quadrant measurement setting (set menu 3).

Legend for measurement display items
 ● : Max./Min. values included; ○ : Max. value included;
 ○ : Cumulative value

How to Order

Specify in all cases Specify if required



- For orders where values are not specified, instruments will be manufactured using standard specifications (5A input, analog output: 4-20mA, no settings).
- For products with settings, please specify the settings in detail.



ME110SSR (with transmission function)

- Circuit alternating current/voltage, power, reactive power, power factor, frequency, power consumption, reactive power consumption, high-frequency voltage/current can be displayed and measured amounts are transmitted/output.
- The line-up includes models with CC-Link communication and ModBus communication. Construction of all types of network systems is simple and easy.
- The line-up includes ME110SSR-CH, which features CC-Link communication function, three-point digital input, and one-point alarm output.

Specifications

Model		Multi-measuring instruments			
Model name		ME110SSR-C	ME110SSR-CH	ME110SSR-MB	
Phase-wire type		1P2W/1P3W/3P3W (2CT), 3P3W (3CT) /3P4W (common)			
Measurement display item and class	Alternating current	Instantaneous value(class: 0.5)	1P2W/1P3W/3P3W : ●×3 (1, 2, 3)	3P4W : ●×5 (1, 2, 3, N, AVG)	
		Demand (class: 0.5)	1P2W/1P3W/3P3W : ●×3 (1, 2, 3)	3P4W : ●×5 (1, 2, 3, N, AVG)	
	Alternating voltage (class: 0.5)	Instantaneous value(class: 0.5)	1P2W/1P3W/3P3W : ●×3 (12, 23, 31)	3P4W : ●×4 (12, 23, 31, AVG)	
		Demand (class: 0.5)*1	1P2W/1P3W/3P3W : ●	3P4W : ●×4 (Σ, 1, 2, 3)	
	Power	Apparent power (class: 0.5)	3P4W only : ●×4 (Σ, 1, 2, 3)		
		Reactive power (class: 0.5)	1P2W/1P3W/3P3W : ●	3P4W : ●×4 (Σ, 1, 2, 3)	
	Power factor (class: 2.0)	1P2W/1P3W/3P3W : ●	3P4W : ●×4 (Σ, 1, 2, 3)		
	Frequency (class: 0.5)		●		
	Power consumption (class: normal)		○		
	Reactive power consumption		○		
	High-frequency current (class: 2.5)		○ (THD, h1---h13)		
	High-frequency voltage (class: 2.5)		○ (THD, h1---h13)		
	Instrument rating	Rated voltage	1P2W/1P3W/3P3W : 110/220V (1P3W: 220V only)	50-60Hz	3P4W : 63.5/110V-277/480V 50-60Hz
Rated current		AC 5A or AC 1A	*AC 1A is a special product (please specify when ordering)		
Settings	Scale settings	Automatic scale display based on primary voltage, primary current, power/reactive power scale, positive only/positive-negative power scale settings			
	Setting range	●Voltage Three-phase, three-wire; single-phase, two-wire For direct connection: 150V (110V), 300V (220V) When using VT: 60V-750kV (<100V: set upper two digits) (≥100V: set upper three digits)	Single-phase, three-wire For direct connection: 300V (220V)	Three-phase, four-wire Direct connection: 277V/480V (max.) When using VT: 60V-750kV (<100V: set upper two digits) (≥100V: set upper three digits)	●Current 5A-30kA (<10A: set upper two digits) (≥10A: set upper three digits)
	*When using VT, it is possible to choose 100, 110 or 220V for the instrument rated voltage.				
Alarm settings	Upper-limit setting	A, DA, V, W, DW, cosφ, var, Hz, HI, HV			
	Lower-limit setting	A, DA, V, W, DW, cosφ, var, Hz			
	Setting precision	±1.0%			
Consumption VA	External switch	Choice of two from switch display, switch phase, reset, max./min., and external contact input			
	Input circuit	Voltage circuit: Each phase 0.1VA (110VAC), 0.2VA (220VAC) Current circuit: Each phase 0.1VA			
	External switching circuit	Each phase 0.2VA (110VAC), 0.5VA (220VAC) 0.2W (100VDC)			
Transmission functions	Auxiliary power source	8VA (110VAC), 9VA (220VAC), 6W (100VDC)			
	Transmission type	CC-Link transmission	CC-Link transmission	RS485 (ModBus) communication	
	Transmission method	Broadcast polling method	Broadcast polling method	Mod Bus RTU	
	Transmission speed	10M, 5M, 2.5M, 625k, 156kpbs	10M, 5M, 2.5M, 625k, 156kpbs	2400, 4800, 9600, 19200, 38400bps	
	Connection method	Bus connection method	Bus connection method	Multi-drop	
	Transmission distance	100m (10Mbps) - 1200m (156kpbs)	100m (10Mbps) - 1200m (156kpbs)	1000m	
Output capability	No. of connectable units	42 units (remote device station)	42 units (remote device station)	31 units	
	Digital input	—	○ (3 circuits)	—	
	Alarm output	—	○ (1 point)	—	
Power outage compensation		Recorded in nonvolatile memory (set-up value, max./min. values, power consumption, reactive power consumption)			
Auxiliary power source		100-240VAC ±15% 50-60Hz/75-140VDC (dual use)			
Weight		0.5kg			

- Note: *1 The power demand value is calculated based on thermo-motive models; it is not the average power for 30 minutes.
- References: 1 Classes for current, power and reactive power are standard maximum-scale values.
 2 When the input voltage is 11V or lower, the items relating to voltage are displayed as follows. However, note that current measurements are displayed even when there is no voltage input.
 • Voltage, power, reactive power: Displayed as 0.
 • Power factor: Displayed as 1.
 • Frequency, high-frequency current/voltage: Displayed as ----.
 3 If a power factor of 0 is measured for reactive power consumption, use the two-quadrant measurement setting (set menu 3).

Legend for measurement display items
 ● : Max./Min. values included; ○ : Max. value included;
 ○ : Cumulative value

How to Order

Specify in all cases Specify if required

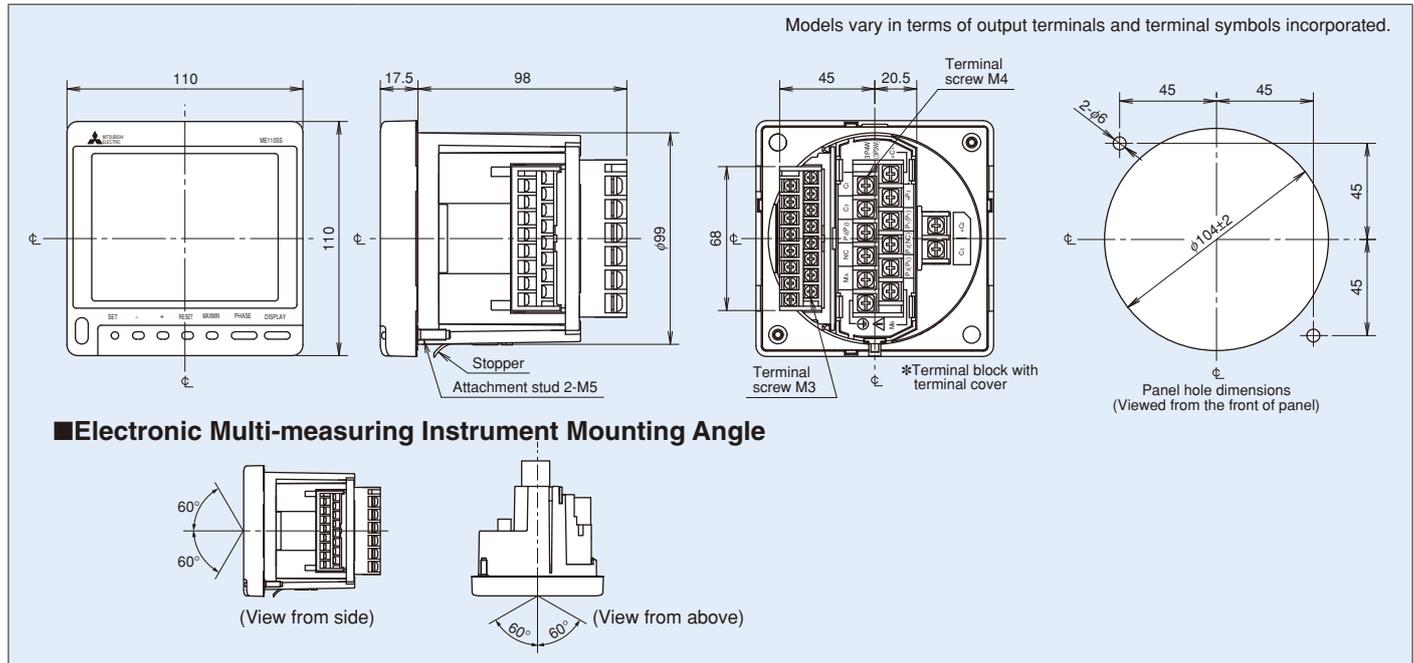
Model name	Phase/Wire no.	Rated current	With settings	No. of units
ME110SSR-B	3P3W	5A	With settings	5

- For orders where values are not specified, instruments will be manufactured using standard specifications (5A input, no settings).
- For products with settings, please specify the settings in detail.

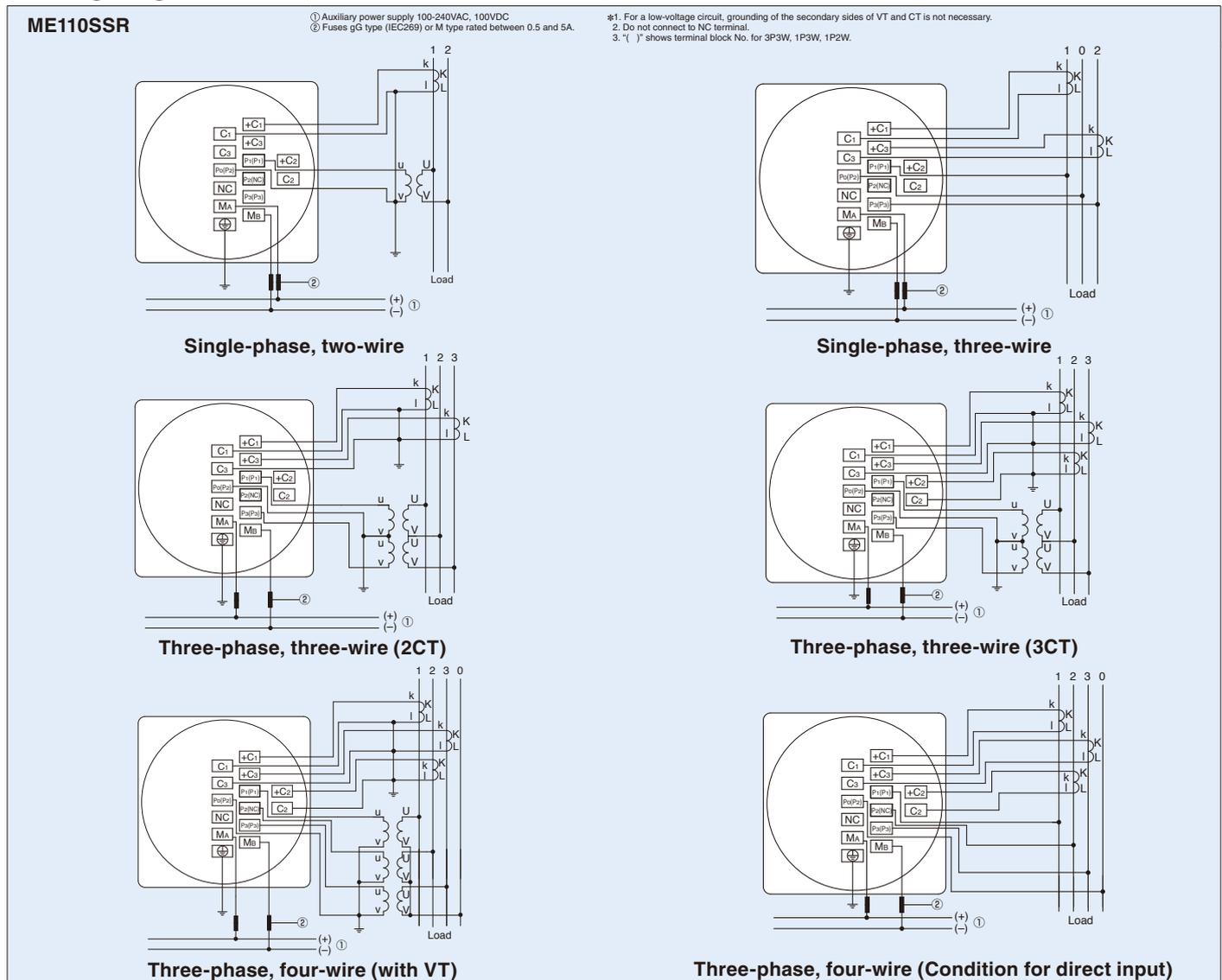
External Dimensions/Wiring Diagrams

Electronic Multi-measuring Instruments

External Dimensions



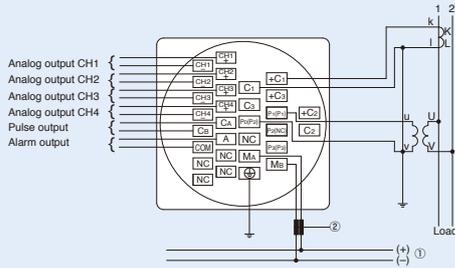
Wiring Diagrams



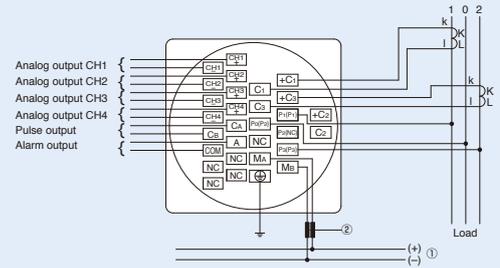
ME110SSR-4APH

- ① Auxiliary power supply 100-240VAC, 100VDC
- ② Fuses gG type (IEC269) or M type rated between 0.5 and 5A.

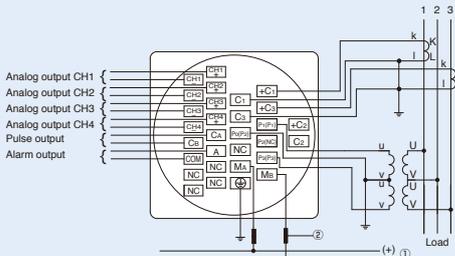
- *1. For a low-voltage circuit, grounding of the secondary sides of VT and CT is not necessary.
- 2. Do not connect to NC terminal.
- 3. () shows terminal block No. for 3P3W, 1P3W, 1P2W.



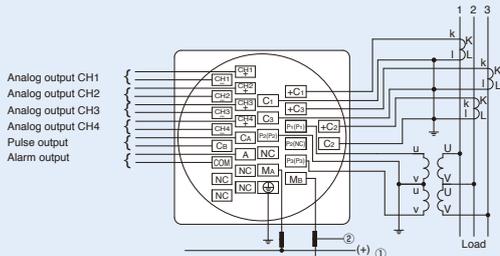
Single-phase, two-wire



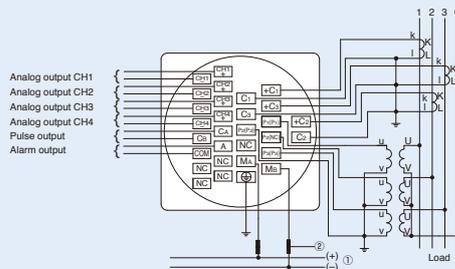
Single-phase, three-wire



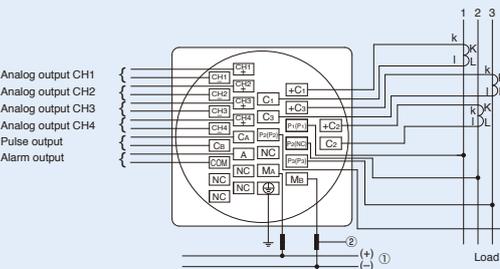
Three-phase, three-wire (2CT)



Three-phase, three-wire (3CT)



Three-phase, four-wire (with VT)

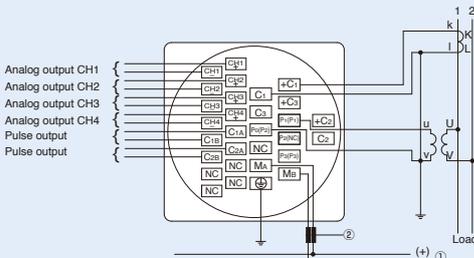


Three-phase, four-wire (Condition for direct input)

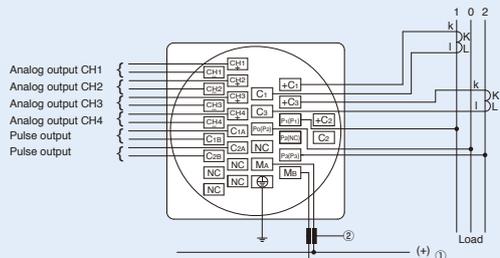
ME110SSR-4A2P

- ① Auxiliary power supply 100-240VAC, 100VDC
- ② Fuses gG type (IEC269) or M type rated between 0.5 and 5A.

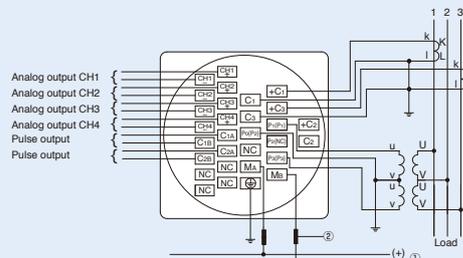
- *1. For a low-voltage circuit, grounding of the secondary sides of VT and CT is not necessary.
- 2. Do not connect to NC terminal.
- 3. () shows terminal block No. for 3P3W, 1P3W, 1P2W.



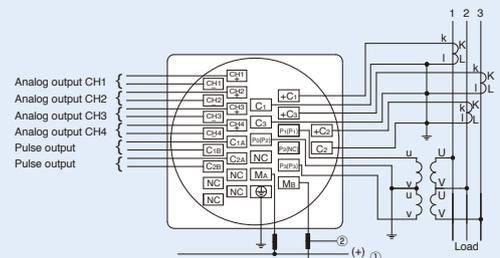
Single-phase, two-wire



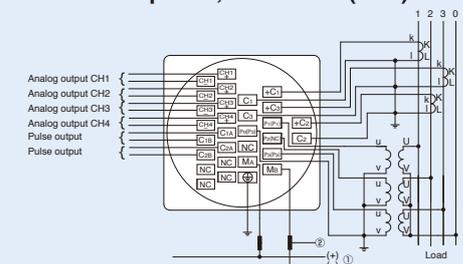
Single-phase, three-wire



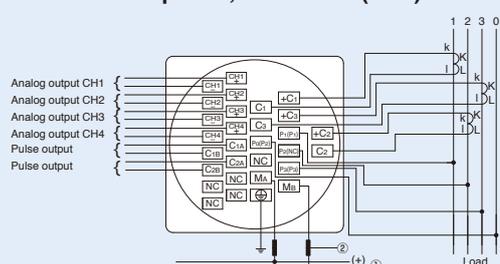
Three-phase, three-wire (2CT)



Three-phase, three-wire (3CT)

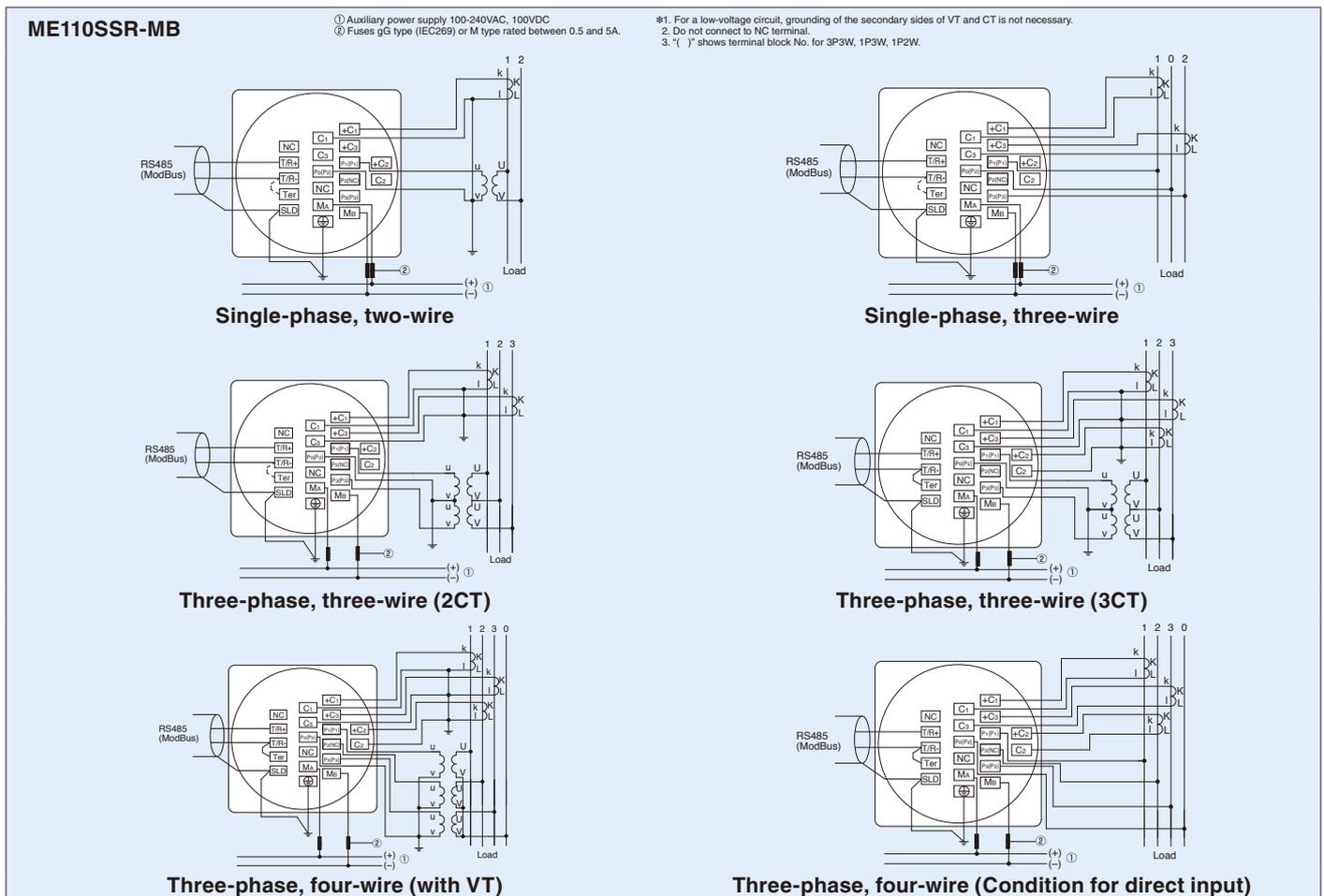
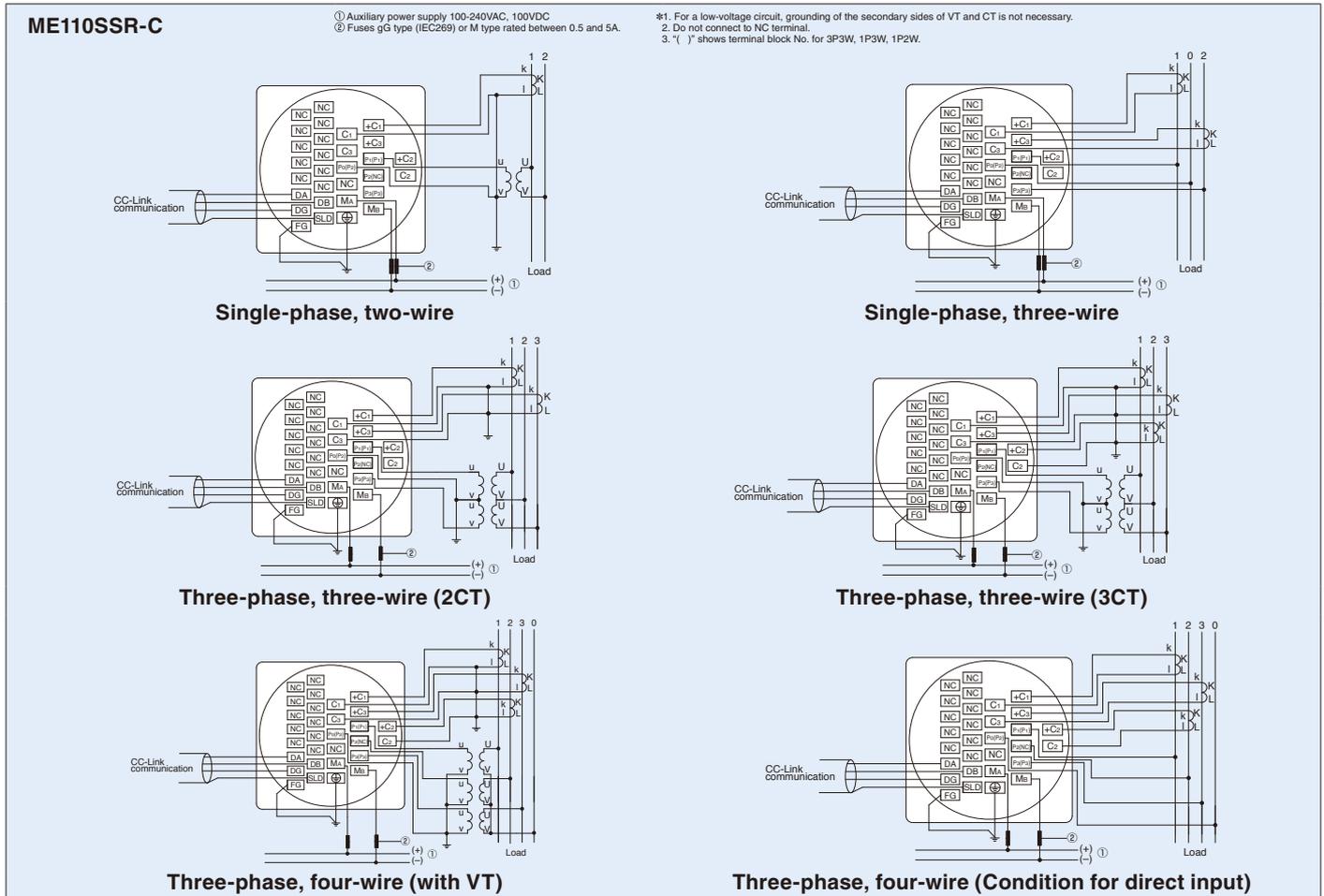


Three-phase, four-wire (with VT)



Three-phase, four-wire (Condition for direct input)

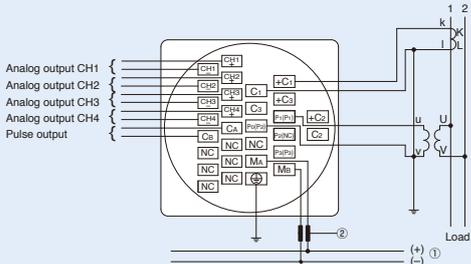
External Dimensions/Wiring Diagrams



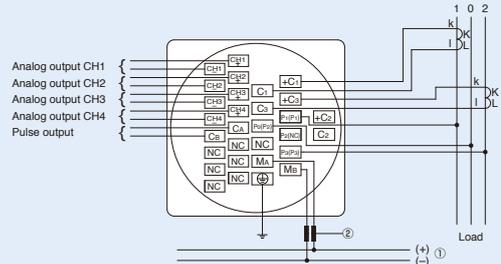
ME110SSR-4AP

- ① Auxiliary power supply 100-240VAC, 100VDC
- ② Fuses gG type (IEC269) or M type rated between 0.5 and 5A.

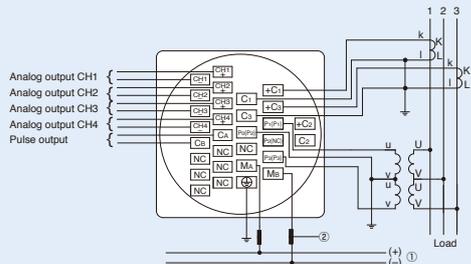
- *1. For a low-voltage circuit, grounding of the secondary sides of VT and CT is not necessary.
- 2. Do not connect to NC terminal.
- 3. () shows terminal block No. for 3P3W, 1P3W, 1P2W.



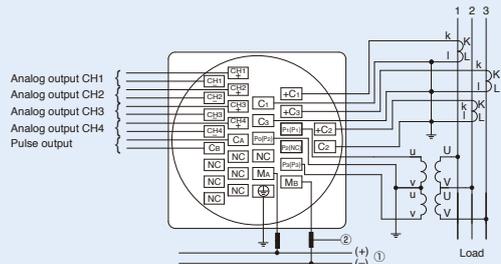
Single-phase, two-wire



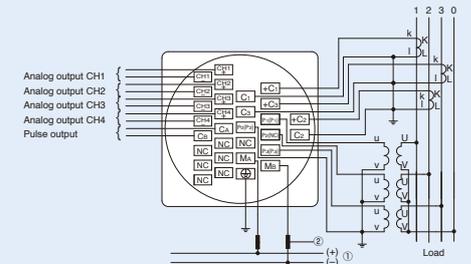
Single-phase, three-wire



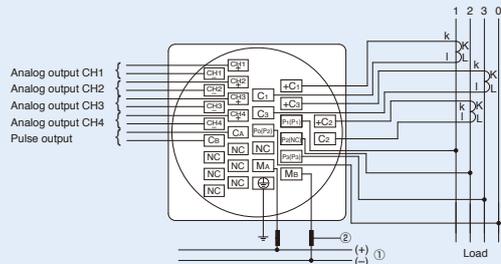
Three-phase, three-wire (2CT)



Three-phase, three-wire (3CT)



Three-phase, four-wire (with VT)

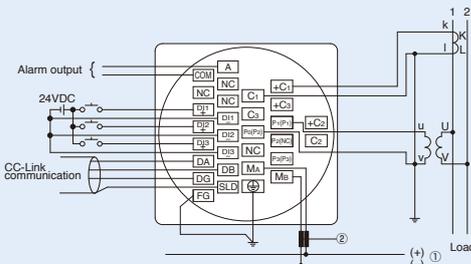


Three-phase, four-wire (Condition for direct input)

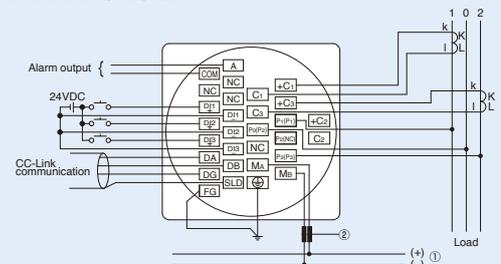
ME110SSR-CH

- ① Auxiliary power supply 100-240VAC, 100VDC
- ② Fuses gG type (IEC269) or M type rated between 0.5 and 5A.

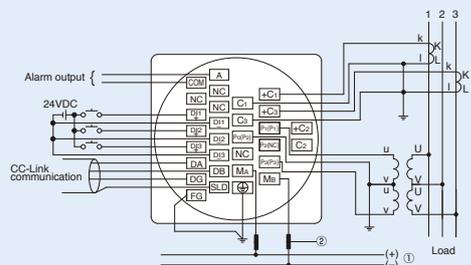
- *1. For a low-voltage circuit, grounding of the secondary sides of VT and CT is not necessary.
- 2. Do not connect to NC terminal.
- 3. () shows terminal block No. for 3P3W, 1P3W, 1P2W.



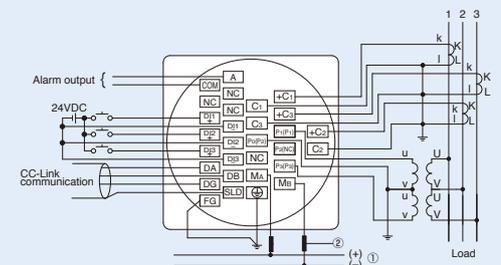
Single-phase, two-wire



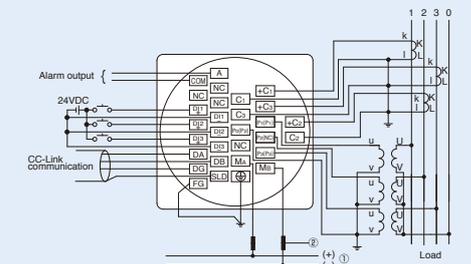
Single-phase, three-wire



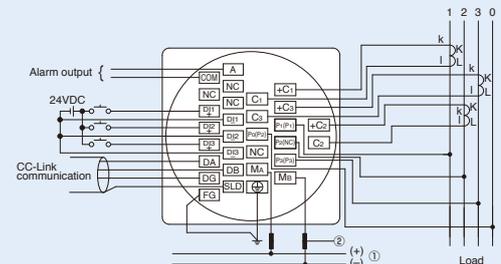
Three-phase, three-wire (2CT)



Three-phase, three-wire (3CT)



Three-phase, four-wire (with VT)



Three-phase, four-wire (Condition for direct input)

Safety Precautions

Be sure to read these instructions before using the products described in this brochure

Be sure to keep the manual where it is easily available for future reference.

Be sure that the end user receives and reads the manual and precautions before using a product.



This symbol indicates that improper use/handling may cause the unit to malfunction, electrical shock or even a fire. To ensure safety, follow instructions at all times.

■ Operating Environment/Conditions



The use of in instrument in any of the following environments may cause a malfunction or reduce service life. Do not use instruments in environments where:

- Ambient temperature is outside the range of -5~50°C
- Daily average temperature exceeds 35°C
- Relative humidity is outside the range of 30~85%, or where condensation occurs
- There is excessive dust, corrosive gas, salt-saturated air or oily smoke
- The instrument is subject to excessive vibration or physical shock
- The instrument is exposed to rain or drops of water
- The instrument is exposed to direct sunlight
- There are pieces of metal or inductive substances nearby
- There is a strong electromagnetic field or excessive external electrical noise interference
- The altitude is higher than 1,000m above sea level

■ Installation and Connection



- The instrument should be installed and used by qualified electricians.
- The instrument must not be connected to a power source and used outside of the panel.
- Before use, verify the following:
 - Auxiliary power supply and measurement ratings
- Connect the wires carefully while referencing the wiring diagrams (see pages 9-13).
- Be sure there are no foreign substances such as sawdust or pieces of wire inside the instrument.
- Be careful not to drop the instrument from a high place. If it is dropped and the display is cracked, do not touch or ingest the liquid-crystal solution and be sure to immediately and thoroughly wash it off if it comes into contact with any part of the body.
- To prevent electrical noise, control wires/communication cables should not be bunched with, or installed close to the main circuit or power wire.

Auxiliary power supply		100-240VAC $\pm 10\%$ (50-60Hz) 100VDC $\pm 25\%$	
Ratings	Voltage	3P3W	110/220VAC phase-phase
		3P4W	277VAC phase-neutral/480VAC phase-phase
	Current	5A, 1A (via current transformer)	
	Frequency	50/60Hz	

- Current circuits, C1, C2 and C3 are measurement category I.
- Voltage circuits, P1, P2 and P3 are measurement category III.
- The instrument must be mounted on a panel, and all connections must be installed inside the cabinet.
- Tighten the terminal screws to the specified torque, and use suitable pressure connectors and wire size.
- When running wires parallel to each other, ensure that a suitable distance is maintained between the communication/input signal lines and power/high-voltage lines as shown below.

Conditions	Length
Power lines below 600V and 600A	30cm or more
Other power lines	60cm or more

■ Operation Instructions



- When the external terminals are connected to external equipment, the instrument and external equipment must not be connected to a power source and used outside the panel.
- The external equipment terminal rating should match the instrument's external terminal rating (see Specifications).

■ Maintenance Instructions



- Do not touch the terminals when live circuits are connected to the instrument.
- Do not try to disassemble or modify the instrument.
- Do use pre-treated wipes to clean the surface, and do not use benzene, thinner or alcohol.

- Use a soft, dry cloth to wipe dirt/dust from the surface.
- Before use, check the following:
 - Check the instrument for damage.
 - Check the display for damage.
 - Check for abnormal noise, odor and heat generation.
 - Check for loose/disconnected fittings and wires.

■ Storage Conditions

Storage of an instrument in one of the environments described below may cause a malfunction or reduce service life. Do not store instruments for long periods of time in environments where:

- Ambient temperature is outside the range of -20~60°C.
- Relative humidity is outside the range of 30~85%, or where condensation occurs.
- There is excessive dust, corrosive gas, salt-saturated air or oily smoke.
- The instrument is directly exposed to rain, drops of water or sunlight.
- Average daily temperature exceeds 35°C.
- The instrument is subjected to excessive vibration or physical shock.
- There are pieces of metal or inductive substances nearby.

■ Disposal

- Dispose of these products as industrial waste.
- These products are not battery operated.

■ Guarantee

The product is covered by a free-of-charge warranty for one year from the day of purchase. However, please note that Mitsubishi Electric is not liable for: problems with products caused by the customer or any third party, legal problems relating to the products, and failure of/or damage to products caused by improper use or nonconformance to the precautions or operating instructions.

Mitsubishi Electric Electronic Multi-measuring Instruments

Service Network

Country / Region	Company	Address	Telephone
Indonesia	P.T. Sahabat Indonesia	JL. Muara Karang Selatan Blok A/Utara No.1 kav. No.11 P.O. Box 5045/Jakarta/11050. Jakarta, Indonesia	+62-(0)21-6621780
Korea	Mitsubishi Electric Automation Korea Co., Ltd.	2 Fl. Dong Seo Game Channel Bldg., 1F 660-11 Deungchon-Dong, Kanguseo-Ku, Seoul, 157-030 Korea	+82-2-3668-6567
Philippines	Edison Electric Integrated, Inc.	24th Fl. Galleria Corporate Center Edsa Cr, Ortigas Ave. Quezon City, Metro Manila, Philippines	+63-(0)2-643-8691
Taiwan	Setsuyo Enterprise Co., Ltd.	6F, No.105 Wu-Kung 3rd Rd., Wu-Ku Hsiang, Taipei Hsien, Taiwan	+886-(0)2-2298-8889
Thailand	United Trading & Import Co. Ltd.	77/12 Bumrungruang Road, Klong Mahanak, Pomprab, Bangkok 10100	+66-223-4220-3
Vietnam	Sa Giang Techno Co., Ltd.	47-49 Hoang Sa St., Da Kao Ward, D.1, HCMC	+84-8-910 4763 / 4758 / 4759

Safety Tips: Be sure to read the instruction manual fully before using this product.

Precautions Before Use

- Please consult with a Mitsubishi Electric representative when considering the application of products presented in this catalogue with machinery or systems designed for specialized use such as nuclear power, electrical power, aerospace/outer space, medical, or passenger transportation vehicles.
- Mitsubishi Electric Corporation shall not be liable, to the customer or equipment user, for:
 - 1) Any damage found not to be attributable to a Mitsubishi Electric product.
 - 2) The loss of opportunity or profits for the customer or user caused by any fault in a Mitsubishi Electric product.
 - 3) Damage, secondary damage or accident compensation resulting from special factors regardless of whether or not such factors could be predicted by Mitsubishi Electric.
 - 4) Damage to products of other companies and/or guarantees relating to other services.



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BUILDING, 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN