SPECIFICATION SHEET

TOA DKK

Electromagnetic Conductivity Transmitter MDM-135A (2-wire system)
Electromagnetic Concentration Transmitter MDM-137A (2-wire system)

Simple-to-operate Two-wire-type Electromagnetic Conductivity Analyzer/Transmitter and Electromagnetic Concentration Analyzer/Transmitter for Field Installation, in a Compact and Rigid Aluminum Enclosure.

Features

○ High-conductivity measurement … MDM-135A
Made for accurate measurements for samples with high conductivity of 20 mS/cm or more, which cannot be measured using 2-electrode-type analyzers; also, this instrument covers a wide range of measurements from 0 - 500 µS/cm up - 0 - 2,000 mS/cm and allows for a wide range of temperature compensation from –5 - 120°C.

○ Concentration measurement of highly corrosive solutions … MDM-137A
Made for accurate measurements and a wide range of concentration (%) of strong acid/alkali solutions, such as HCl, H2SO4, and NaOH; the measurement range and temperature compensation range can be adjusted to meet the individual needs and specifications of our customers. The device provides a linear output of 4 to 20 mADC for concentration values.

○ Teflon® PFA detector
All wetted parts of the detector, made of Teflon® PFA, are highly resistant to corrosion, heat, and pressure. Thus, the instrument is able to operate under extreme measurement conditions. All-purpose PVC detectors are also available.

○ Less susceptible to deposits (contamination and bubbles)
The detector, which has a toroidal shape, can prevent deposits and bubbles in solutions from forming on the surface, thus ensuring long-term and stable measurements.

○ Temperature indication
Sample temperatures are measured and displayed (–5 - 120°C).

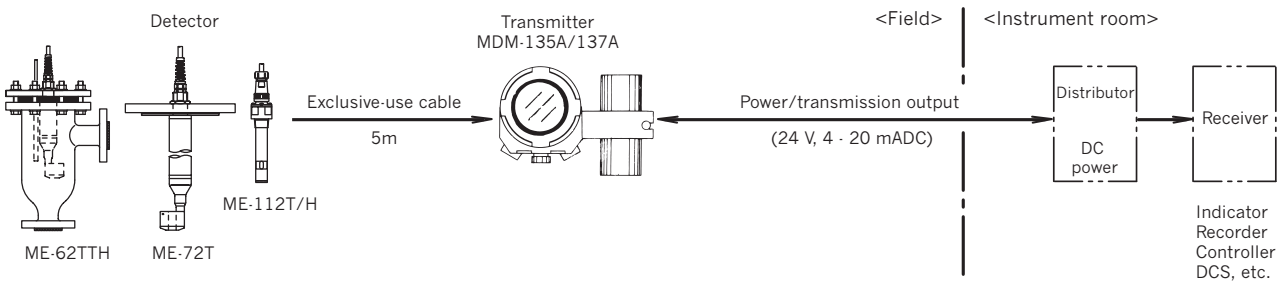
○ Output signals can be frozen during maintenance work.
By switching to ST-BY (Stand By) mode, the output value is held at the value that was set before the mode was enabled, therefore preventing disruption to the control system.

○ Measured value adjustment
The measured value can be shifted by a conductivity (concentration) value as demanded for the convenience of process operation. (Shift width: ±20% of the measured value)

○ Self diagnostics
The instrument is equipped with a burn-out function. When the self-diagnostics function detects an error in the measurement system, such as the failure of the temperature compensation resistor or a computer error, the burn-out function provides notification of the problem by causing the transmission output to go off-scale (upper or lower limit).

○ Automatically returns to measurement mode
If the unit remains in maintenance mode for 2 hours, it will be returned to measurement mode automatically.

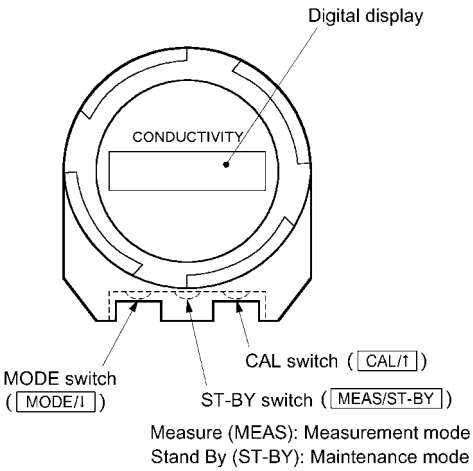
Configuration



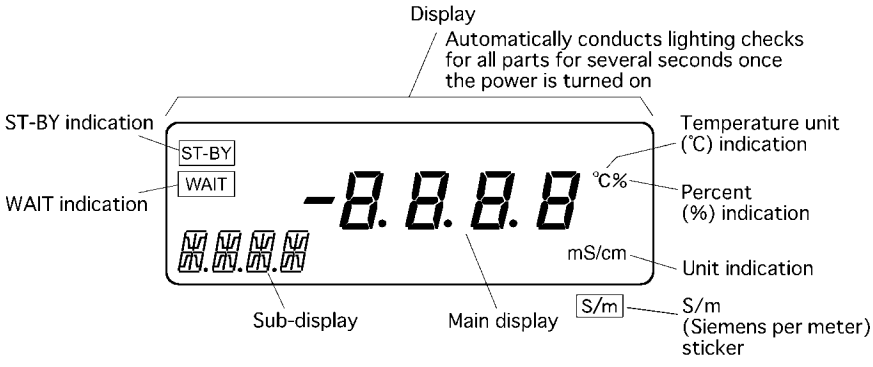
Standard Specifications

Product name		Electromagnetic conductivity analyzer/transmitter	Electromagnetic concentration analyzer/transmitter
Model		MDM-135A	MDM-137A
Measurement object		Conductivity of various solutions, such as acid and alkali solutions	Concentration of various solutions, such as acid and alkali solutions
Measurement method		Conductivity measurement by electromagnetic induction	Concentration calculation using the collinear approximation based on the concentration
Measurement range		0 - 2.00 mS/cm (0 - 200.0 mS/m) at 25°C 0 - 20.00 mS/cm (0 - 2.000 S/m) at 25°C 0 - 200.0 mS/cm (0 - 20.00 S/m) at 25°C 0 - 2,000 mS/cm (0 - 200.0 S/m) at 25°C The measurement range can be freely reconfigured with a width of 25% or larger for each range.	measurement by electromagnetic induction NaCl: 0 - 5/10/20/25% etc. HCl: 0 - 5/10/15%, 25 - 35/40% etc. HNO3: 0 - 5/10/20%, 40 - 80% etc. NaOH: 0 - 5/10/15%, 20 - 40% etc. H2SO4: 0 - 5/20/40%, 93 - 99.5% etc.
		(Temperature: –5 - 120°C; display only; no transmission output signal is provided.)	
Indication		4-digit display on LCD	
Temperature compensation		Compensation range: –5 - 105°C Temperature characteristics: Conductivity temperature characteristics of the NaCl solution or percentage/°C input or 6-point input Accuracy: Within ±1.5% FS (by equivalent input)	Compensation range: Reference temperature ±10°C Temperature characteristics: Select one from the conductivity temperature characteristics table for the relevant solution
Performance	Linearity	Within ±0.5% FS (by equivalent input)	Concentration: within ±3% FS (by equivalent input)
	Repeatability	Within ±0.2% FS (by equivalent input)	—
Transmission output		4 - 20 mADC, isolated Load resistance: 650Ω or less	4 - 20 mADC, isolated (Load resistance: 650Ω or less) Provides a linear output for solution concentration values
Power supply		24 VDC ±10%	
Power consumption		0.6 VA or less	
Ambient temperature/humidity		–20 - 55°C, 99% RH or less (no condensation)	
Construction		Outdoor installation, IP55 (dustproof, jet-proof type)	
Dimensions		118 (W) x 129 (H) x 178 (D) mm	
Mounting		Mounted on a 50-A pipe	
Weight		Approx. 3 kg	
Cable port		G3/4 (PF3/4F), 3 ports	
Materials	Main body	Cast aluminum alloy	
	Window	Resin	
	Brackets	SUS304	
Paint color		Metallic silver and blue	

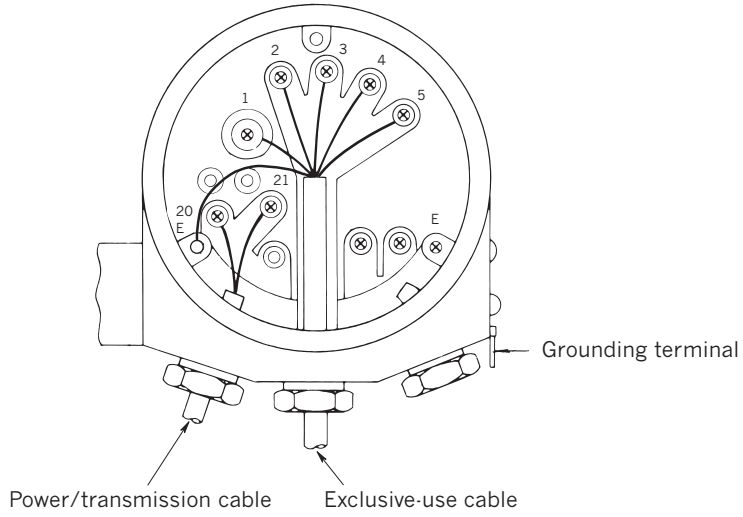
Operating switches and display



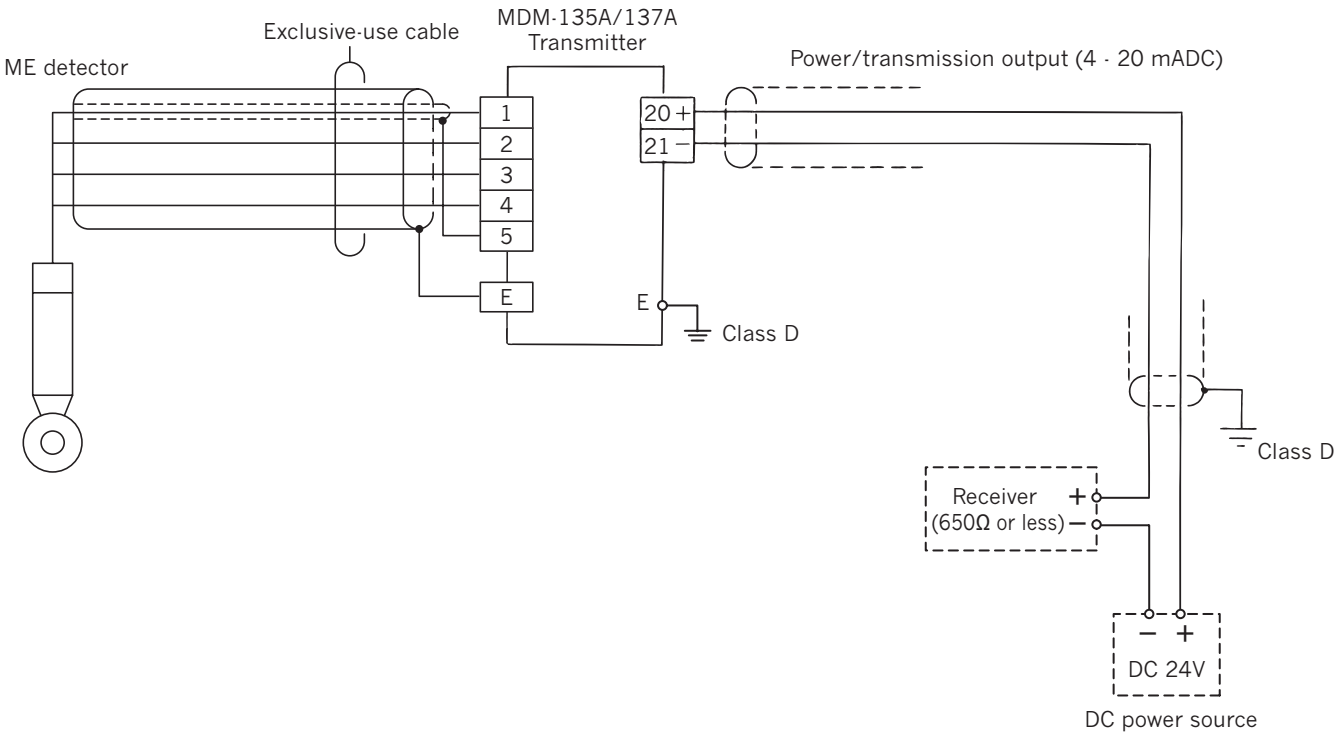
Measure (MEAS): Measurement mode
Stand By (ST-BY): Maintenance mode



Terminals

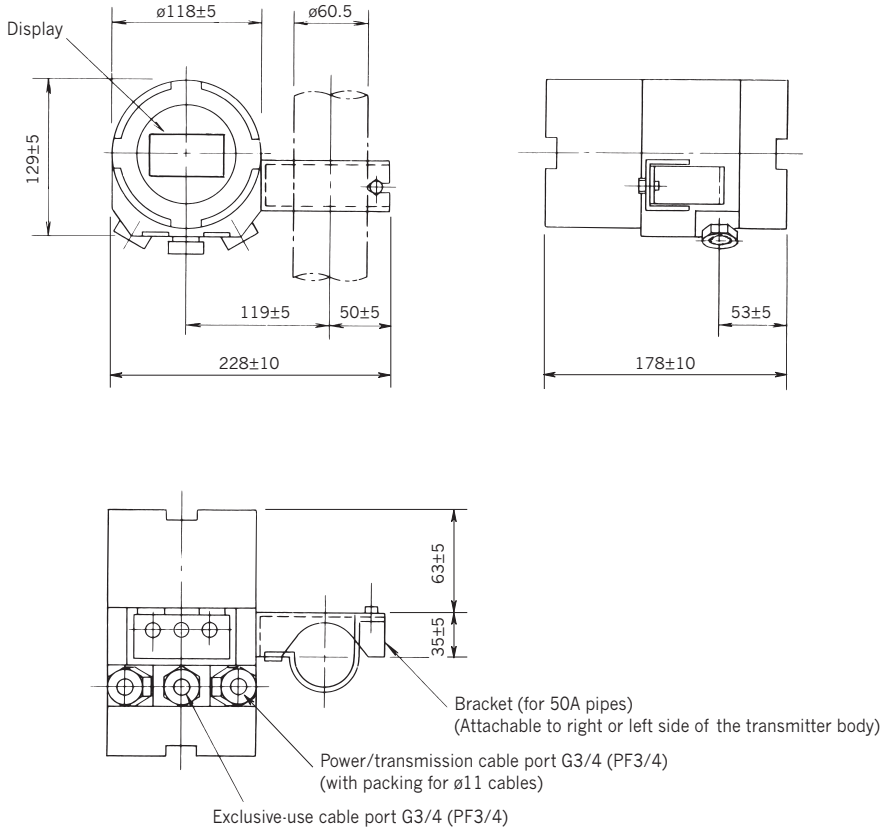


Wiring Diagrams



Dimensions

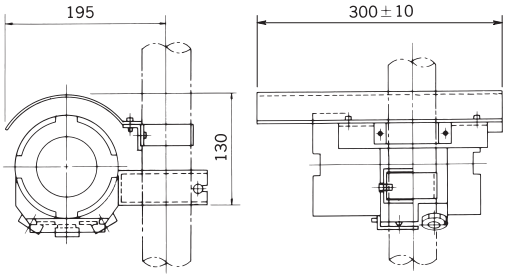
Unit : mm



● Hood (optional)

Recommended when the instrument is installed at a location exposed to direct sunlight

Material : SUS304
Mounting : 50A pipe
Code No. : 544493K



Product code

MDM135A-1-□□□□□□□□

- Measurement range (transmission output range)
  - A: 0 - 2.000 mS/cm at 25°C
  - B: 0 - 20.00 mS/cm at 25°C
  - C: Indicated in mS/cm from this line and above: 0 - 200.0 mS/cm at 25°C
  - D: 0 - 2,000 mS/cm at 25°C
  - E: Indicated in S/m from this line and below: 0 - 200.0 mS/m at 25°C
  - F: 0 - 2.000 S/m at 25°C
  - G: 0 - 20.00 S/m at 25°C
  - H: 0 - 200.0 S/m at 25°C
  - Y: Custom spec.*1
- Cell constant of detector to be combined
  - 1: 9.0/cm 900/m (ME-100 series)
  - 2: 2.6/cm 260/m (ME-11T, ME-6□/7□series)
- Surface finish (coating)*2
  - A: Standard coating
  - B: High-performance coating
- Arrester*3
  - 0: None
  - 1: Included
- Cable port adapter
  - 0: None G3/4 (PF3/4) standard
  - 1: G1/2 (PF1/2) SUS304
  - 2: NPT1/2 SUS304
  - 3: NPT3/4 SUS304
- Hood (sunshade)
  - 0: None
  - 1: Equipped (Code No. 544493K)
- Language of documents
  - A: Japanese (standard)
  - B: English
- Detector to be combined
  - 0: None*4
  - 1: To be manufactured together with a transmitter

Custom spec. code;
Numeric digit: 9
Alphabet: Z

*1. The measurement range can be freely reconfigured at a width of 25% or larger of each range.
Example 1: When specifying a width of 25% for the 0 - 2.000mS/cm range – Please specify the measurement range of 0 - 0.500mS/cm and confirm it with us.
Example 2: When specifying a width of 50% for the 0 - 2,000mS/cm range – Please specify the measurement range of 0 - 1,000mS/cm and confirm it with us.

*2. Standard coating: Melamine primer and topcoat; average film thickness: 30µm or greater; glossiness: G40
High-performance coating: Epoxy primer and middle coat, polyurethane resin topcoat; film thickness: 100µm or greater; glossiness: G80

*3. A ceramic surge arrester (simplified) can be mounted to the power and transmission line.

*4. If you select “None” because you will use an existing detector, etc., please let us know the serial number of the detector to be combined. However, please note that this instrument cannot be combined with older-model detectors, including the MC-61T, MC-61E, and MC-71T.

Product code

MDM137AA-2-□□□□□□□□□ Sodium chloride concentration meter (NaCl)
MDM137AB-2-□□□□□□□□□ Hydrochloric acid concentration meter (HCl)
MDM137AC-2-□□□□□□□□□ Nitric acid concentration meter (HNO_3)
MDM137AD-2-□□□□□□□□□ Sodium hydroxide concentration meter (NaOH)
MDM137AE-2-□□□□□□□□□ Sulfuric acid concentration meter (H_2SO_4)
MDM137AF-2-□□□□□□□□□ Other concentration meter*1

- Measurement range of concentration meter
  - A to Z: Select either A - Z from Table 1.
- Temperature compensation range
  - A to Z: Select either A - Z from Table 2.
- Cell constant of the detector to be combined
  - 1: 9.0/cm (ME-100 series)
  - 2: 2.6/cm (ME-11T, ME-6□/7□series)
- Surface finish (coating)*8
  - A: Standard coating
  - B: High-performance coating
- Arrester*9
  - 0: None
  - 1: Included
- Cable port adapter
  - 0: None G3/4 standard
  - 1: G1/2 SUS304
  - 2: NPT1/2 SUS304
  - 3: NPT3/4 SUS304
- Hood (sunshade)
  - 0: None
  - 1: Equipped (Code No. 544493K)
- Language of documents
  - A: Japanese (standard)
  - B: English
- Detector to be combined
  - 0: None*10
  - 1: To be manufactured together with a transmitter

Custom spec. code;
Numeric digit: 9
Alphabet: Z

<Table 1>

Solution to be measured			Sodium chloride	Hydrochloric acid	Nitric acid	Sodium hydroxide	Sulfuric acid
Measurement range of the concentration meter	01-digit	A	0 - 5% NaCl	0 - 5% HCl	0 - 5% HNO_3	0 - 5% NaOH	0 - 5% H_2SO_4
		B	0 - 10% NaCl	0 - 10% HCl	0 - 10% HNO_3	0 - 10% NaOH	0 - 10% H_2SO_4
		C	0 - 20% NaCl	0 - 15% HCl	0 - 20% HNO_3	0 - 15% NaOH*3	0 - 20% H_2SO_4
		D	0 - 25% NaCl	25 - 35% HCl	0 - 25% HNO_3	20 - 40% NaOH*3	0 - 30% H_2SO_4*3
		E		25 - 40% HCl	40 - 80% HNO_3		40 - 80% H_2SO_4
		F		30 - 40% HCl	60 - 70% HNO_3		60 - 80% H_2SO_4
		G			60 - 80% HNO_3		93 - 99.5% H_2SO_4*3
		H					94 - 99.5% H_2SO_4*3
		Y	Other NaCl	Other HCl	Other HNO_3	Other NaOH	Other H_2SO_4
		Z	Custom spec.	Custom spec.	Custom spec.	Custom spec.	Custom spec.

<Table 2>

Temperature compensation range	02-digit	A	0 - 20˚C	0 - 20˚C	0 - 20˚C	0 - 20˚C *4	0 - 20˚C*6
		B	10 - 30˚C	10 - 30˚C	10 - 30˚C	10 - 30˚C *4	10 - 30˚C*6
		C	20 - 40˚C	20 - 40˚C	20 - 40˚C	20 - 40˚C	20 - 40˚C
		D	30 - 50˚C	30 - 50˚C	30 - 50˚C	30 - 50˚C	30 - 50˚C
		E	40 - 60˚C	40 - 60˚C	40 - 60˚C	40 - 60˚C	40 - 60˚C
		F	50 - 70˚C	50 - 70˚C	50 - 70˚C	50 - 70˚C	50 - 70˚C
		G	60 - 80˚C	60 - 80˚C	60 - 80˚C	60 - 80˚C *5	60 - 80˚C
		H	70 - 90˚C	70 - 90˚C	70 - 90˚C	70 - 90˚C	70 - 90˚C
		J	80 - 100˚C	80 - 100˚C	80 - 100˚C	80 - 100˚C	80 -100˚C
		Y	Other spec.	Other spec.*7	Other spec.*7	Other spec.	Other spec.
		Z	Custom spec.	Custom spec.*7	Custom spec.*7	Custom spec.	Custom spec.

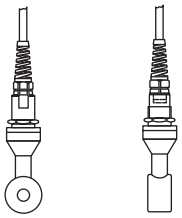
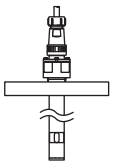
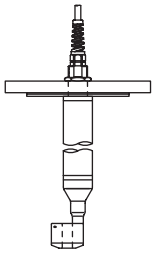
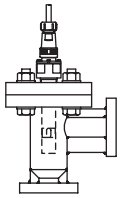
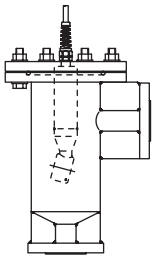
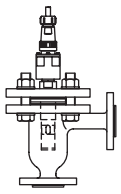
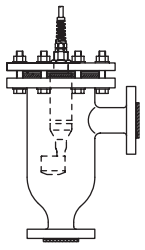
*1 Please contact us if you use another concentration meter.
*2 Please contact us if you select “Other spec.” or “Custom spec.” in the “Measurement range of the concentration meter” or “Temperature compensation range” section.
*3 If you specify one of these measurement ranges for NaOH/H2SO4 solutions, the available temperature compensation range will be limited. Please check notes *4, *5, and *6.
*4 No unit is available for NaOH solutions with 0 - 15% concentrations, if you select one of these temperature compensation ranges.
*5 No unit is available for NaOH solutions with 20 - 40% concentrations, if you select one of these temperature compensation ranges.
*6 No unit is available for NaOH solutions with 0 - 30% concentrations or H_2SO_4 solutions with 93 - 99.5% and 94 - 99.5% concentrations, if you select this temperature compensation range.
*7 If an intermediate temperature for the temperature compensation of the hydrochloric acid or nitric acid concentration measurement is 70°C or more, the concentration measurement range will be limited. Please contact us for more details.
*8 Standard coating: Melamine primer and topcoat; average film thickness: 30μm or greater; glossiness: G40
High-performance coating: Epoxy primer and middle coat, polyurethane resin topcoat; film thickness: 100μm or greater; glossiness: G80
*9 A ceramic surge arrester (simplified) can be mounted on the power and transmission line.
*10 If you select “None” because you will use an existing detector, etc., please let us know the serial number of the detector to be combined. However, please note that this instrument cannot be combined with older-model detectors, including the MC-61T, MC-61E, and MC-71T.

Combination Detectors

The MDM-135A/137A analyzers/transmitters can be combined with 2 types of detectors: the compact and lightweight ME-100 series (cell constant; 9.0/cm) and the highly sensitive ME-6/7 series (cell constant; 2.6/cm).

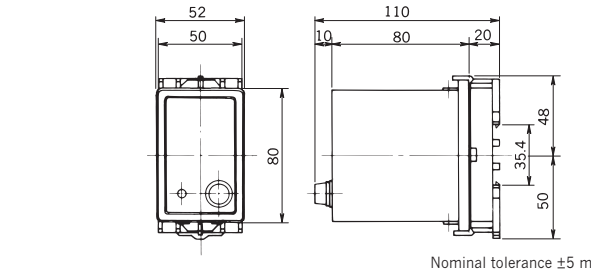
Each series features 4 types to choose from, including the pipe-insertion type, closed-tank-insertion/immersion type, flow-through type, and the drop-in type. Wetted parts are made of either polyvinyl chloride (PVC) or Teflon®-based material (PVDF/PFA) for all types. Therefore, they are suitable for a wide range of applications at various plants.

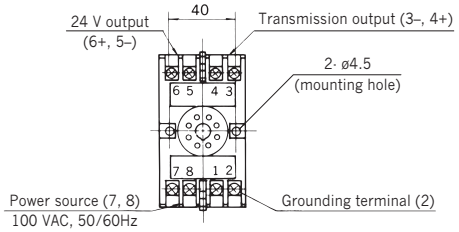
The typical 5 models for the ME-100 and ME 6/7 series are shown in the table below.

	Compact-type ME-100 series (Combination cable: EC-11 equipped with a waterproof connector)		Highly sensitive-type ME-6/7 series (Cable-integrated type)	
Type	Appearance	Specifications	Appearance	Specifications
Pipe-insertion type (screw-in mounting)		Model name: ME-112□ Wetted part material: Either C-PVC, PVDF, or PFA Screw: R3/4 Insertion length: 123mm		Model name: ME-11T Wetted part material: PFA Screw: R2 Insertion length: 84mm Cable length: 5m
Closed-tank-insertion /immersion type (flange mounting)		Model name: ME-122□ Wetted part material: Either C-PVC, PVDF, or PFA Connection flange: 50A JIS10K FF Length below flange: 96 - 2,000mm		Model name: ME-72T Wetted part material: PFA Connection flange: 100A JIS10K RF Length below flange: 500 - 2,000mm Cable length: 5m
Flow-through type with case (flange connection)		Model name: ME-142H Wetted part material: C-PVC Case flange: 15A JIS10K FF		Model name: ME-63E Wetted part material: PVC Case flange: 25A JIS10K FF Cable length: 5m
		Model name: ME-142F/T Wetted part material: Either PVDF or PFA Case flange: 15A JIS10K RF		Model name: ME-62T Wetted part material: PFA Case flange: 25A JIS10K RF Cable length: 5m
Drop-in type		Model name: ME-111H, directly connected to the cable Wetted part material: C-PVC OD: ø30 Cable length: 5 - 10m		Model name: ME-11T Wetted part material: PFA Weight: Approx. 1kg OD: ø60 Cable length: 5 - 25m

Related Equipment

A power supply unit (24VDC) for the 2-wire-type transmitter and a meter relay with a power source are available. Please make your order according to your needs.





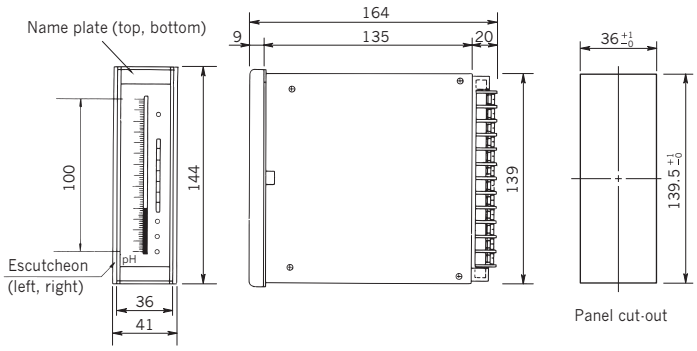
● Power supply unit

Model	: PA-24
Output voltage rating	: 24 VDC +3/-1V
Output current rating	: 2 - 22 mA (Parallel connection between 2instruments cannot be made.)
Power requirements	: 100 VAC±10%, 50/60Hz
Ambient conditions	: –5 - 55°C
Construction	: Indoor installation, plug-in type
Weight	: Approx. 300 g

* The output transmission signal of 4 - 20 mADC can be drawn from the terminal block.

● Bar graph meter relay with DC power source

Model	: BMR-24
Output voltage	: 24 VDC±1V
Input	: 4 - 20 mADC (input resistance; 10Ω)
Alarm outputs	: High-high, high, low, low-low, 4 contacts (Contact rating; 125 VAC, 0.5 A)
Scale	: Custom specifications
Scale length	: 100 mm
Display	: Red LED, 101 dots
Power requirements	: 85V - 264VAC, 50/60Hz
Power consumption	: Approx. 5 VA
Ambient conditions	: 0 - 45°C, 40 - 80% RH
Weight	: Approx. 450 g



DKK-TOA CORPORATION

CAUTION Do not operate producuts before consulting instruction manual.

International Operations:
DKK-TOA Corporation
29-10, 1-Chome, Takadanobaba, Shinjuku-ku,
Tokyo 169-8648 Japan
Tel : +81-3-3202-0225 Fax : +81-3-3202-5685