HORIBA

COND

RESIST

Water Quality Meter Series — Selection Guidebook

for Electroconductivity Meters and Electrical Resistivity Meters

Table of Contents

For all water treatment processes, from pure

The "water expert," a long-selling product, now protects the quality of the world's water.

Horiba Advanced Techno's water quality meter series has all the measurement items necessary for sensors as well as holders and cleaners can be combined to meet each customer's needs, from or the "48/96 Series Indoor-Use Panel Installation Type Water Quality Meter" according to your site's

Outdoor-use type Water Quality Analyzer **H-1 Series**

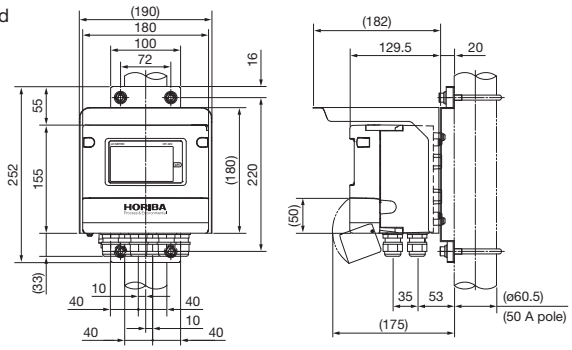
Developed to embody the key concepts of Tough (Robustness), Intelligence (Functionality), and Easy Maintenance (Maintainability) to cope with the harsh environmental conditions of on-site processes. The robust die-cast aluminum case, noise resistance, auto-calibration, various self-diagnostic functions, and a wide range of interfaces facilitate on-site water quality management both indoors and outdoors.

H-1 Series Lineup

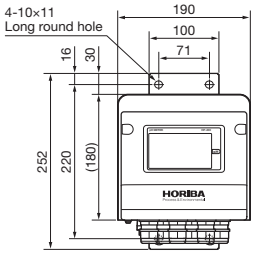
pH meters	HP-200	4-wire
	HP-300	2-wire
	HP-300-IS	2-wire, explosion-proof
ORP meters	HO-200	4-wire
	HO-300	2-wire
	HO-300-IS	2-wire, explosion-proof
Electroconductivity meters (Conductivity meters)	HE-200C	4-wire, low concentration
	HE-300C	2-wire, low concentration
	HE-300C-IS	2-wire, explosion-proof
	HE-200H	4-wire, high concentration
Electrical resistivity meters (Resistivity meters)	HE-200R	4-wire
	HE-300R	2-wire
Dissolved oxygen meters (DO meters)	HD-200	4-wire, diaphragm type
	HD-300	2-wire, diaphragm type
	HD-200FL	4-wire, optical type
Turbidimeters	HU-200TB-W	4-wire, wide range, flow-through type
	HU-200TB-H	4-wire, high concentration, flow-through type
	HU-200TB-EH	4-wire, high sensitivity, flow-through type
Turbidity and SS meters	HU-200TB-IM	4-wire, immersion type
MLSS meters (Sludge densitometers)	HU-200SS	4-wire
Colorimeters	HU-200CL	4-wire
Residual chlorine meters	HR-200	4-wire, water flow bead type
	HR-200RT	4-wire, rotating electrode bead type
Turbidity, chromaticity, and residual chlorine meters	HU-200M-CR	4-wire
Simplified fluoride ion meters	HC-200F	4-wire
	HC-300F	2-wire
Ammonium nitrogen meters	HC-200NH	4-wire

External dimensions (Unit: mm)

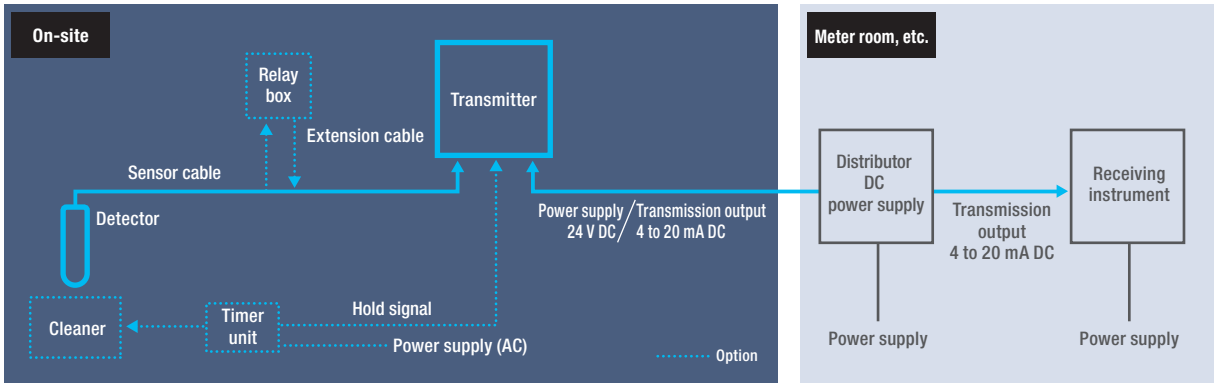
Pole-mounted



Wall-mounted



2-wire system configuration diagram (example) (H-1 series)



water and tap water to sewage and wastewater.

comprehensive measurement and management of water quality. A wide variety of transmitters and measurement to maintenance. Choose either the "H-1 Series Outdoor-Use Type Water Quality Meter" conditions.

Indoor-use panel installation type Water Quality Analyzer 48/96 Series

DIN standard size for installation in control panels. Each control panel has a durable embossed finish and can be operated using the front keys. The compact body offers a full range of functionality, including a status display that uses icons and a security function that employs a PIN code.

Transmitter: 48 series

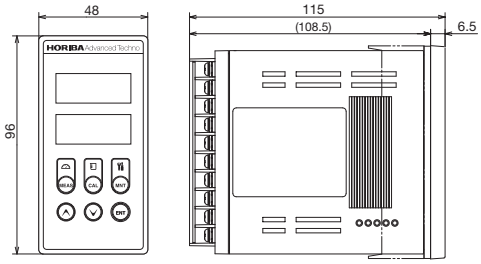
96 series

48/96 Series Lineup

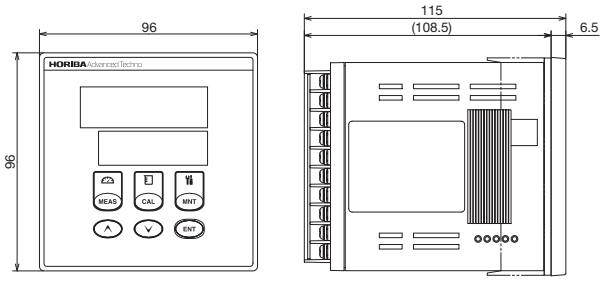
pH meters	HP-480	4-wire
	HP-480PL	4-wire, pulse proportional control
	HP-480TP	4-wire, time-division proportional control
	HP-960FTP	4-wire, 4-point alarm, time-division proportional control
ORP meters	HO-480	4-wire
Electroconductivity meters (Conductivity meters)	HE-480C	4-wire, for low concentration
	HE-480C-DC24V	4-wire, 24 V DC power supply
	HE-960CW	4-wire, 2-channel
	HE-960CW-P	4-wire, 2-channel, USP/EP compatible
	HE-480H	4-wire, for high concentration
	HE-960HI	4-wire, wide range
Electrical resistivity meters (Resistivity meters)	HE-480R	4-wire
	HE-480R-DC24V	4-wire, 24 V DC power supply
	HE-960RW	4-wire, 2-channel
Dissolved oxygen meters (DO meters)	HD-480	4-wire, diaphragm type
Residual chlorine meters	HR-480	4-wire, galvanic type
	HR-480P	4-wire, polarograph type, water flow bead type

External dimensions (Unit: mm)

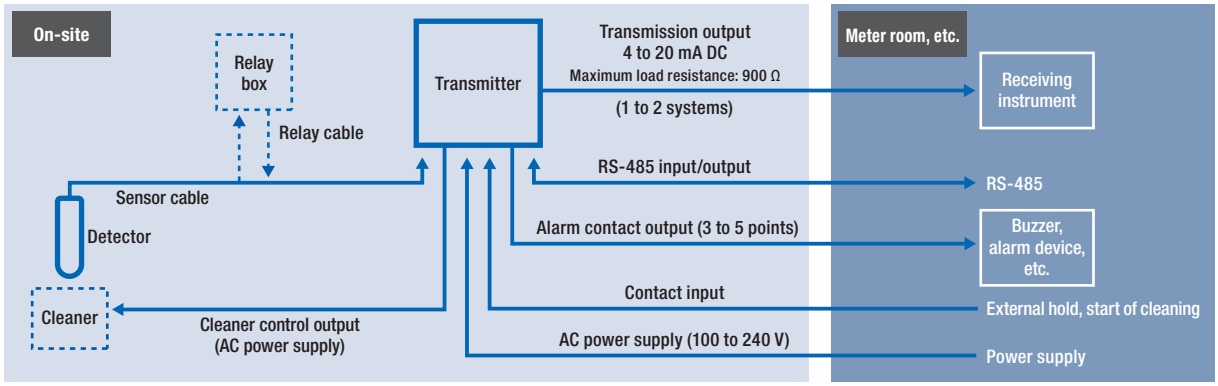
Transmitter: 48 series



Transmitter: 96 series



4-wire system configuration diagram (example) (H-1 series, 48/96 series)



MEMO

Water Quality Meter Series

Electroconductivity (Conductivity) Meter

[Object of measurement] **Electrical conductivity in solution**
[Principle of measurement]
- **4-pole AC** (HE-200H/HE-480H/HE-960HI/HE-150HI)
- **2-pole AC** (HE-200C/HE-300C/HE-300C-IS/HE-480C/HE-480C-DC24V/HE-960CW/HE-150CW/HE-960CW-P)

[Applications] **HE-200H/HE-480H**
- Concentration control of chemicals and seawater
- Monitoring and control of solutions in general and wastewater processes
- Monitoring and control of hydroponic solution

HE-200C/HE-300C/HE-300C-IS/HE-480C/HE-480C-DC24V/HE-960CW
- Monitoring and control of pure water and boiler water

HE-960HI/HE-150HI
- Concentration control of chemical solutions for CIP cleaning in food processes

HE-960CW/HE-150CW/HE-960CW-P
- Monitoring and control of pharmaceutical manufacturing processes

H-1 Series

Outdoor-use type
electroconductivity meter

Electroconductivity transmitter (low conductivity type): Code table

Model	Specifications
HE-200C	4-wire, power supply: 100 to 240 V AC, 50/60 Hz
HE-300C	2-wire, power supply: 24 V DC
HE-300C-IS	2-wire, intrinsically safe explosion-proof, power supply: 24 V DC

Electroconductivity transmitter (high conductivity type): Code table

Model	Specifications
HE-200H	4-wire, power supply: 100 to 240 V AC, 50/60 Hz

48/96 Series

Indoor-use panel
installation type
electroconductivity meter

Electroconductivity transmitter (low conductivity type): Code table

Model	Specifications
HE-480C	4-wire, power supply: 100 to 240 V AC, 50/60 Hz
HE-480C-DC24V	4-wire, power supply: 24 V DC
HE-960CW	With USP/EP judgment, 4-wire, 2-channel specification, power supply: 100 to 240 V AC, 50/60 Hz
HE-150CW	Box storage type transmitter, 4-wire, power supply: 100 to 240 V AC, 50/60 Hz
HE-960CW-P	With USP/EP judgment, 4-wire, 2-channel specification, power supply: 100 to 240 V AC, 50/60 Hz

Electroconductivity transmitter (high conductivity type): Code table

Model	Specifications
HE-480H	4-wire, power supply: 100 to 240 V AC, 50/60 Hz

Electroconductivity transmitter (wide-range type): Code table

Model	Specifications
HE-960HI	4-wire, power supply: 100 to 240 V AC, 50/60 Hz
HE-150HI	Box storage type transmitter, 4-wire, power supply: 100 to 240 V AC, 50/60 Hz

Electrical Resistivity (Resistivity) Meter

[Object of measurement] **Electrical resistivity of pure water and ultrapure water**
[Principle of measurement] **2-pole AC**
[Applications] **Control and monitoring in treatment and production processes for pure water and ultrapure water**

H-1 Series

Outdoor-use type
electrical resistivity meter

Electrical resistivity transmitter: Code table

Model	Specifications
HE-200R	4-wire, power supply: 100 to 240 V AC, 50/60 Hz
HE-300R	2-wire, power supply: 24 V DC

48/96 Series

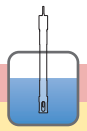
Indoor-use panel installation type
electrical resistivity meter

Electrical resistivity transmitter: Code table

Model	Specifications
HE-480R	4-wire, power supply: 100 to 240 V AC, 50/60 Hz
HE-480R-DC24V	4-wire, power supply: 24 V DC
HE-960RW	4-wire, 2-channel specification, power supply: 100 to 240 V AC, 50/60 Hz

* The information in this catalog is current as of August 2024. For the latest information, please refer to our website.
* Please note that some products in this catalog are made-to-order.

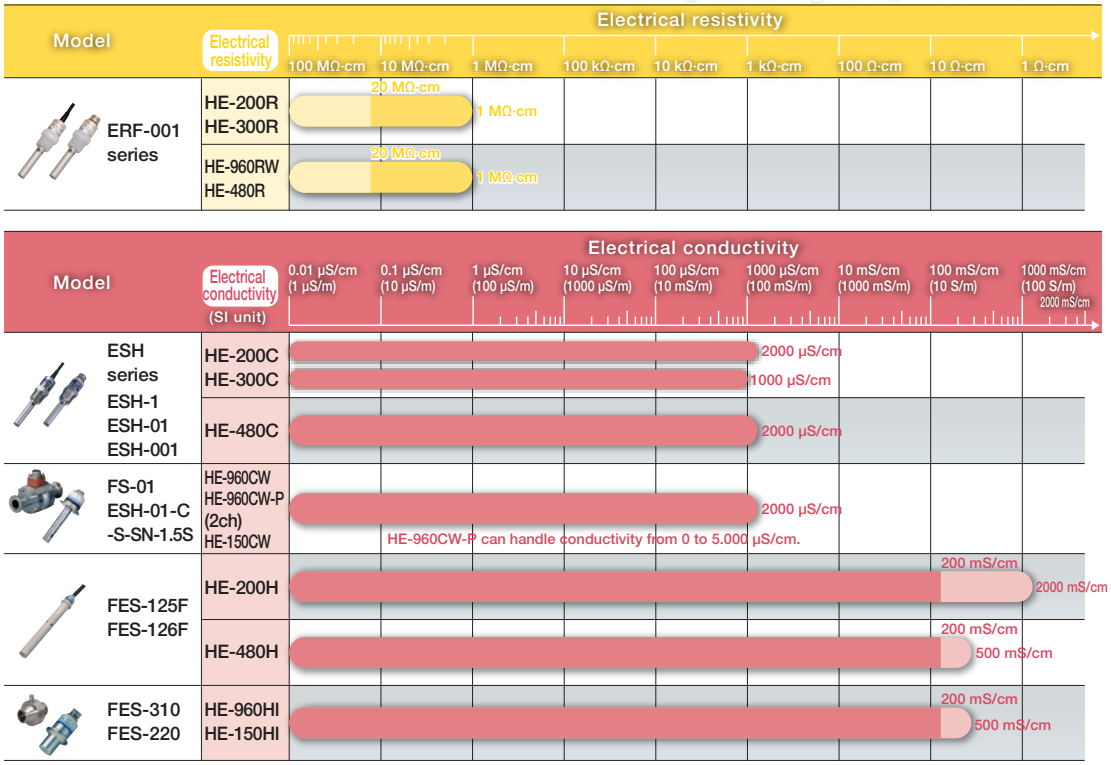
Sensors and Holders



Selection of Electrodes

Products for the pharmaceutical and food industries are marked "Med" and "Food," respectively.

With temperature compensation / Without temperature compensation



Selection of Holders

Model	ERF series	ESH series * Exclusively for FES-125F/126F	FS series	FES series
Immersion type				EH-101 EH-102PF
Flow-through type	EFA-30 EFA-30P EFA-30S	EFA-31 EFA-31P EFA-31S		EF-20 EF-20P EF-20S

		High temperature	High pressure inside piping	Installed outdoors (lead type only) () indicates the material.
Immersion type	EH-101	—		△ (PP)
	EH-102PF	—		○ (PVDF)
Flow-through type	EF-20	—	△	○ (R-PVC gray)
	EF-20P	○	△	○ (PVDF)
	EF-20S	○	○	○ (SUS316)
	EFA-30	—	△	○ (PVC)
	EFA-30P	○	△	○ (PVDF)
	EFA-30S	○	○	○ (SUS316)
	EFA-31	—	△	○ (PVC)
	EFA-31P	○	△	○ (PVDF)
	EFA-31S	○	○	○ (SUS316)

* For details, see p. 28.

○: 100°C max. —: 50°C max.

○: 0.5 MPa max. △: 0.1 MPa max.

○: Optimal △: Avoid direct sunlight

To customers in the pharmaceutical and food industries:

The following is a list of products for which various types of documents can or cannot be issued.
(For the costs of issuing various documents, please contact us.)

○: Can be issued ×: Cannot be issued —: N/A

Applicable product name		Model	Inspection report	Traceability certificate/ Traceability system diagram	Validation certificate (Certificate of inspection equipment calibration)	Mill sheet	Surface treatment certificate		Certificate of non-oil treatment
							Buffing certificate	Electropolishing certificate	
High-electroconductivity meter	Transmitter	HE-960HI/HE-150HI	○	○	○	—	—	—	—
	Sensor	FES-220 series				○	○	×	○
		FES-310 series				○	○	×	○
Low-electroconductivity meter	Transmitter	HE-960CW/HE-960CW-P/HE-150CW	○	○	○	—	—	—	—
	Sensor	ESH-01-C-S-SN series				○	○	○	○
		ESH-01-C-S-ST (Insertion sensor)				×	×	×	○
		FS-01 series				○	○	○	○

The above various certificates for shipping inspection are provided as separate sets for transmitters and sensors. For details, refer to the right column.

[For transmitters] Set content

- Inspection report
- Traceability certificate/ Traceability system diagram
- Validation certificate(Certificate of inspection equipment calibration)

[For sensors] Set content

- Inspection report
- Traceability certificate/ Traceability system diagram
- Validation certificate (Certificate of inspection equipment calibration)
- Mill sheet
- Certificate of surface treatment (Buffing certificate/Electropolishing certificate)
- Certificate of non-oil treatment

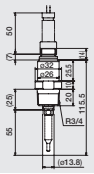
Electrical resistivity sensors

These general-purpose electrical resistivity sensors are useful for processing pure water and ultrapure water (RO film processing) and can be applied to a wide range of production processes. Two types are available: a lead type in which the cable and the sensor are integrated, and a connector type in which the cable can be removed from the sensor.

■ERF
(Connector type)

External dimensions (Unit: mm)

•ERF



Electroconductivity sensors

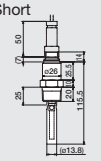
Low conductivity sensors

These general-purpose electroconductivity sensors are useful for controlling pure water and boiler water and for monitoring wastewater treatment. Two types are available: a lead type in which the cable and the sensor are integrated, and a connector type in which the cable can be removed from the sensor.

■ESH
(Short cell)

External dimensions (Unit: mm)

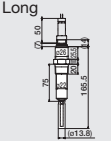
•ESH: Short



■ESH
(Long cell)

External dimensions (Unit: mm)

•ESH: Long



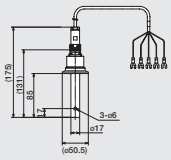
Low conductivity sanitary sensors Med

These sensors are intended for pharmaceutical manufacturing processes and comply with the pharmacopoeias (USP, EP, JP) of various countries. The sensor surface is treated with #400 buffing and electropolishing to realize a highly sanitary surface free of irregularities that is resistant to contamination. These sensors are durable to high pressures and high temperatures and can be used for chemical control after CIP/SIP. Two types are available: a flow-through (in-line) type for positioning the sensor between pipes, and an insertion type for inserting the sensor into a pipe. Various sizes and arrangements are available.

■ESH
-01-C-S-SN-1.5S

External dimensions (Unit: mm)

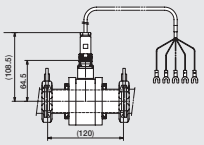
•ESH-01-C-S-SN-1.5S



■FS-01FC

External dimensions (Unit: mm)

•FS-01FC



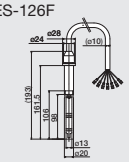
High conductivity sensors

These general-purpose electroconductivity sensors are useful for monitoring wastewater treatment, seawater, and hydroponic solutions. Two types are available: a lead type for directly dropping the sensor into a water tank or using an immersion holder, and a connector type for directly inserting the sensor into a pipe or using a flow-through holder.

■FES-125F/126F

External dimensions (Unit: mm)

•FES-126F



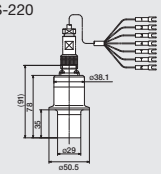
High conductivity sanitary sensors Food

These sensors are #400 buffed and polished to realize high sanitation with no unevenness and contamination resistance. Durable against high pressures and high temperatures, these sensors are ideal for chemical management after CIP/SIP on food production lines. Two types are available: a flow-through (in-line) type for positioning the sensor between pipes, and an insertion type for inserting the sensor into a pipe. Various sizes and arrangements are available.

■FES-220

External dimensions (Unit: mm)

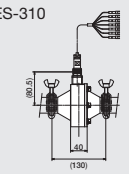
•FES-220



■FES-310

External dimensions (Unit: mm)

•FES-310



Code table

Supported transmitters: HE-200R/HE-300R/HE-480R/HE-480R-DC24V/HE-960RW

Model	Specifications
ERF-001-L-T-Y-10M	Insertion type sensor (short cell), cell constant: 0.01/cm, cable length: 10 m, electrode material: Ti
ERF-001-C-T	Insertion type sensor (short cell), cell constant: 0.01/cm, connector type, electrode material: Ti

Code table

Supported transmitters: HE-200C/HE-300C/HE-300C-IS*2/HE-480C/HE-480C-DC24V/HE-960CW/HE-150CW

Model	Cell constant	Cable	Electrode material	Sensor length	Special specifications*4	Cable length*4	Specifications
ESH							Low conductivity sensor, insertion type
	-001						0.01/cm
	-01						0.1/cm
	-1						1/cm
		-C					Connector type*1
		-L					Lead type*3
			-S				SUS316
			-T				Titanium
				-ST			Short cell
				-LG			Long cell*3
					-Y		Material of liquid-contacting part: PTEE, FFKM
						-10	10m

*1 A CK-Y dedicated cable is required separately. For the details of the cable, see p. 30.
*2 The only supported electrode material for HE-300C-IS (intrinsically safe explosion-proof specification) is titanium, so take note when selecting a transmitter.
*3 If a flange is installed, select a long cell.
*4 Selected only for lead type.

Code table for the insertion type

Supported transmitters: HE-200C/HE-300C/HE-300C-IS/HE-960CW/HE-150CW/HE-960CW-P

Model	Cell constant	Cable	Electrode material	Sensor type	Diameter	Specifications
ESH						Low conductivity sanitary sensor, insertion type
	-01					0.1/cm
		-C				Connector type*1
			-S			SUS316
				-SN		Insertion type
					-1.5S	IDF/ISO 1.5S ferrule

*1 A CK-Y dedicated cable is required separately. For the details of the cable, see p. 30.
Other specifications: Normal temperature range: 0 to 100°C, ambient temperature range: 0 to 50°C, pressure range: 0 to 1 MPa, steam sterilization: 140°C/0.6 MPa within 60 minutes

Code table for the flow-through type

Supported transmitters: HE-200C/HE-300C/HE-300C-IS/HE-960CW/HE-150CW/HE-960CW-P

Model	Cell constant	Electrode material	Connection diameter	Specifications
FS				Low conductivity sanitary sensor, flow-through/connector type*1
	-01FC			0.1/cm
		-SL		SUS316
			-15A	IDF/ISO 15A ferrule
			-1.0S	IDF/ISO 1S ferrule
			-1.5S	IDF/ISO 1.5S ferrule
			-2.0S	IDF/ISO 2S ferrule
			-2.5S	IDF/ISO 2.5S ferrule

*1 A CK-Y dedicated cable is required separately. For the details of the cable, see p. 30.
Other specifications: Normal temperature range: 0 to 100°C, ambient temperature range: 0 to 50°C, pressure range: 0 to 1 MPa, steam sterilization: 140°C/0.6 MPa within 60 minutes

Code table for high conductivity sensors

Supported transmitters: HE-200H/HE-480H

Model	Electrode material	Specifications
FES		High conductivity sensor, insertion type, cell constant: 1/cm, lead type (Cable length: 10 m)
	-125F	PVC: Supported measuring liquid temperature range: 0 to 50°C
	-126F	PPS: Supported measuring liquid temperature range: 0 to 120°C

Code table for high conductivity sanitary sensors

Supported transmitters: HE-960HI/HE-150HI

Model	Sensor type	Cable	Packing material	Sensor type	Connection diameter	Specifications
FES						High conductivity sanitary sensor, cell constant: 0.1/cm
	-220					Insertion type
	-310					Flow-through type
		-L				Lead type (Cable length: 10 m)
		-C				Connector type*5
			-SF			FFKM (Alkali and chemical resistant)
				-SN		Sanitary sensor
					-1.5S	IDF/ISO 1.5S ferrule
					-2.0S	IDF/ISO 2S ferrule
					-2.5S	IDF/ISO 2.5S ferrule*6
					-3.0S	IDF/ISO 3.0S ferrule*6
					-4.0S	IDF/ISO 4.0S ferrule*6
					-4.5S	IDF/ISO 4.5S ferrule*6

*5 An SK dedicated cable is required separately. For the details of the cable, see p. 30.
*6 Supports only FES-310.
Other specifications: Normal operating temperature range: 0 to 110°C, ambient temperature range: 0 to 50°C, pressure range: 0 to 1 MPa, steam sterilization: 140°C/0.6 MPa within 60 minutes

Outdoor-use Type Water Quality Meters H-1 Series

Electroconductivity/Electrical Resistivity Meters Configuration Table

Transmitters pp. 5, 13 to 16, 23 to 24

Electrodes pp. 6 to 7

Electrical conductivity

Low conductivity

- HE-200C — 4-wire
- HE-300C — 2-wire
- HE-300C-IS — 2-wire Explosion-proof

→ ESH series — Insertion sensor
* Selection of the connector type requires the CK-Y dedicated cable.

→ ESH-01-C-S-SN-1.5S — Insertion sensor
* The CK-Y dedicated cable is required.

→ FS-01-FC-SL series — Flow-through sensor
* The CK-Y dedicated cable is required.

High conductivity

- HE-200H — 4-wire

→ FES-125F — PVC
→ FES-126F — PPS

In the case of throw-in, no further selection is required.

Electrical resistivity

- HE-200R — 4-wire
- HE-300R — 2-wire

→ ERF series
* Selection of the connector type requires the CK-Y dedicated cable separately.

Accessories for Transmitters p. 30 (Select if necessary.)

Fitting for air purge — Used at sites where corrosive gases are generated.

Intrinsically safe explosion-proof accessories

- Z787 TIIS — Zener barrier
- KFD2-STC4-EX1 TIIS — Isolated barrier
- Attachment of Ex-tag on the sensor cable — Attachment of Ex-tag on the sensor cable

Relay Box, Relay Cables, Dedicated Cables for Connector Sensors p. 30 (Select if necessary.)

Relay box — Electroconductivity sensor — CT-50EC

Relay cables

- C-5C — [Supported transmitters] HE-200C/HE-300C/HE-300C-IS
- C-7E — [Supported transmitter] HE-200H

Dedicated cables

- CK-Y series — Supported sensors: ESH/FS/ERF series
- SK-Y series — Supported sensors: FES series

Holders p. 28

Holder Accessories pp. 29 to 30

- Flow-through holders
  - Short cell
    - EFA-30 — PVC
    - EFA-30P — PVDF
    - EFA-30S — SUS316
  - Long cell
    - EFA-31 — PVC
    - EFA-31P — PVDF
    - EFA-31S — SUS316
- Immersion holders
  - EH-101 — PP
  - EH-102PF — PVDF
- Flow-through holders
  - EF-20 — PVC
  - EF-20P — PVDF
  - EF-20S — SUS316

  Be sure to select a screw-in adapter.
- Flow-through holders
  - EFA-30 — PVC
  - EFA-30P — PVDF
  - EFA-30S — SUS316

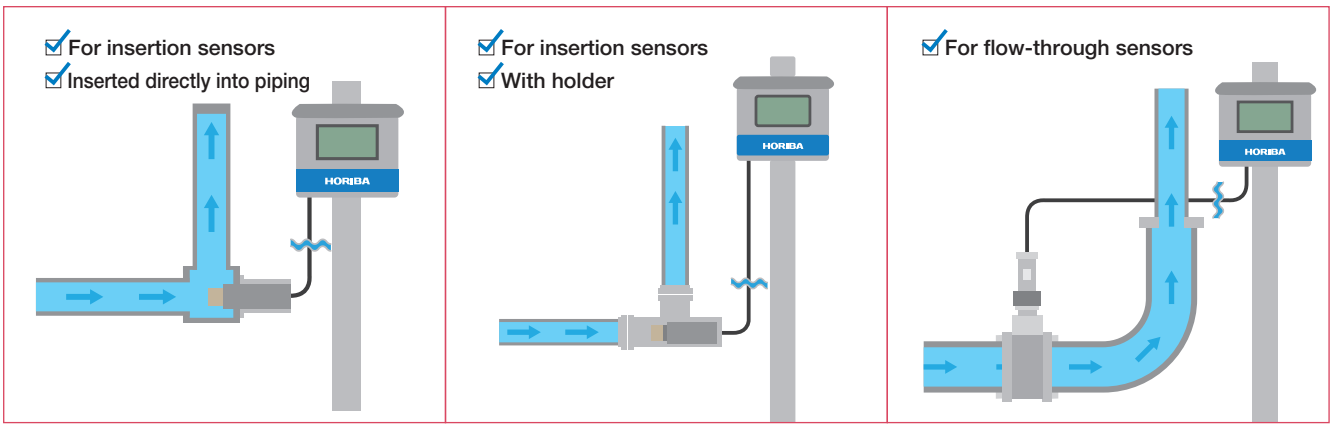
- Mounting brackets
  - BA-2A — ABS
  - BA-1S — SUS304

  Tank wall (for fixing the foundation)
  - MB-10 — SUS304 — For 2B (50 A) poles
- Loose flanges
  - FK-1 — PP
  - FK-1P — PVC
  - FK-1S — SUS316

  Flange size: JIS10K50AFF
- Support pipe
  - SP-60 — SUS316
- Mounting brackets
  - MH-65 — SUS304 — Used in combination with SP-60
- Pole stands
  - PS-50-1.5-SUS-300 — SUS304 1.5m
  - PS-50-1.7-SUS-300 — SUS304 1.7m
- Screw-in adapters
  - EA-20 — Exclusively for FES-125F
  - EA-40 — Exclusively for FES-126F

Flow-through type: Installation image

* Do not install the holder in such a way that the sample flows from top to bottom.



Transmitters pp. 17 to 22, 25 to 27

Electrodes pp. 6 to 7

- Electrical conductivity
  - Low concentration
    - 24 V DC power supply
      - HE-480C
      - HE-480C-DC24V
      - → ESH series → Insertion sensor
        * Selection of the connector type requires the CK-Y dedicated cable.
    - For pharmaceuticals
      - HE-960CW
      - HE-960CW-P
      - Box storage type
        - HE-150CW
      - → ESH-01-C-S-SN-1.5S → Insertion sensor (Sanitary type)
        * The CK-Y dedicated cable is required.
      - → FS-01-FC-SL series → Flow-through sensor (Sanitary type)
        * The CK-Y dedicated cable is required.
  - High concentration
    - HE-480H
      - → FES-125F PVC
      - → FES-126F PPS
      - In the case of throw-in, no further selection is required.
    - For food
      - HE-960HI
      - Box storage type
        - HE-150HI
      - → FES-220 series → Insertion sensor (Sanitary type)
      - → FES-310 series → Flow-through sensor (Sanitary type)
- Electrical resistivity
  - 24 V DC power supply
    - HE-480R
    - HE-480R-DC24V
  - 2-channel specification
    - HE-960RW
  - → ERF series
    * Selection of the connector type requires the CK-Y dedicated cable separately.

Relay Box, Relay Cables, Dedicated Cables for Connector Sensors p. 30 (Select if necessary.)

- Relay box
  - Electroconductivity sensor
    - CT-50EC
      - Relay cables
        - C-5C → [Supported transmitters] HE-480C/HE-480C-DC24V/HE-960CW/HE-150CW/HE-960CW-P
        - C-7E → [Supported transmitters] HE-480H/HE-960HI/HE-150HI
- Dedicated cables
  - CK-Y series → Supported sensors: ESH/FS/ERF series
  - SK-Y series → Supported sensors: FES series

Holders p. 28

Holder Accessories pp. 29 to 30

- **Flow-through holders**
  - Short cell
    - EFA-30 — PVC
    - EFA-30P — PVDF
    - EFA-30S — SUS316
  - Long cell
    - EFA-31 — PVC
    - EFA-31P — PVDF
    - EFA-31S — SUS316
- **Immersion holders**
  - EH-101 — PP
  - EH-102PF — PVDF
- **Flow-through holders**
  - EF-20 — PVC
  - EF-20P — PVDF
  - EF-20S — SUS316

  Be sure to select a screw-in adapter.
- **Flow-through holders**
  - EFA-30 — PVC
  - EFA-30P — PVDF
  - EFA-30S — SUS316

- **Mounting brackets**
  - BA-2A — ABS
  - BA-1S — SUS304

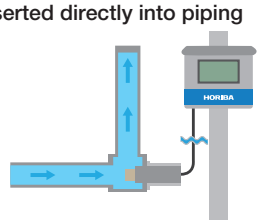
  Tank wall (for fixing the foundation)
  - MB-10 — SUS304 — For 2B (50 A) poles
- **Loose flanges**
  - FK-1 — PP
  - FK-1P — PVC
  - FK-1S — SUS316

  Flange size: JIS10K50AFF
- **Support pipe**
  - SP-60 — SUS316
- **Mounting bracket**
  - MH-65 — SUS304 — Used in combination with SP-60
- **Pole stand**
  - PS-50-1.5-SUS-300 — SUS304 1.5m
  - PS-50-1.7-SUS-300 — SUS304 1.7m
- **Screw-in adapters**
  - EA-20 — Exclusively for FES-125F
  - EA-40 — Exclusively for FES-126F

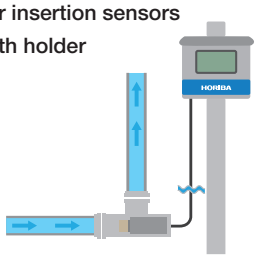
Flow-through type: Installation image

* Do not install the holder in such a way that the sample flows from top to bottom.

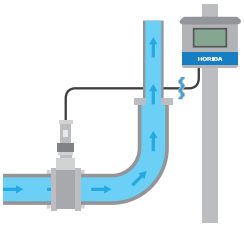
☑ For insertion sensors
☑ Inserted directly into piping



☑ For insertion sensors
☑ With holder



☑ For flow-through sensors

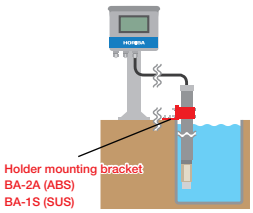


Immersion type: Installation image

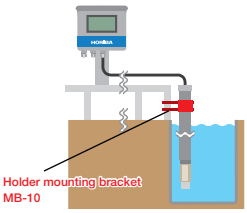
Applicable sensors: FES-125F/FES-126F only

Applicable holders: EH-101 only

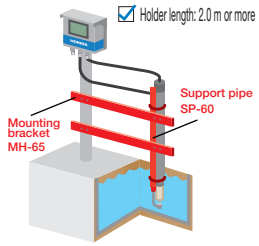
☑ Holder length of 1.5 m or less
☑ Ground-mounted holders



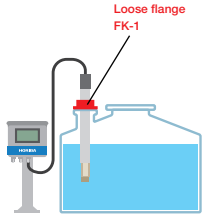
☑ Holder length: 1.5 m or less
☑ Holder installation location: Pole, fence, etc.



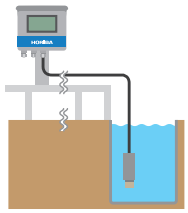
☑ Installation location: Pole
☑ Holder length: 2.0 m or more



☑ Flange installed



☑ For insertion sensors
☑ Direct dropping of sensor into a water tank



MEMO

HE-200C Specification

Product name			Conductivity meter		
Model			HE-200C		
Combined sensor			2-electrode method conductivity sensor ESH, ESD, ESL, and FS Series sensor of cell constant 0.01/cm, 0.1/cm, or 1.0/cm		
Measuring range	Cell constant (/cm)		0.01 (ESH/ESD/ESL-001)	0.1 (ESH/ESD/ESL/FS-01)	1.0 (ESH/ESD/ESL-1)
	Conductivity (µS/cm) (*Note 1)		0.000 to 2.000 0.00 to 20.00	0.000 to 2.000 0.00 to 20.00 0.0 to 200.0 0 to 2000 (*Note 2)	0.0 to 200.0 0 to 2000
	Conductivity (mS/m) (*Note 1)		0.0000 to 0.2000 0.000 to 2.000	0.0000 to 0.2000 0.000 to 2.000 0.00 to 20.00 0.0 to 200.0 (*Note 2)	0.00 to 20.00 0.0 to 200.0
	TDS conversion (mg/L) (*Note 1)		0.00 to 2.00 0.0 to 20.0	0.00 to 2.00 0.0 to 20.0 0 to 200	0 to 200 0 to 2000
	Temperature		0°C to 100°C (Display range: -10°C to 160°C)		
Display resolution	Conductivity/ TDS conversion		As shown in the measuring table.		
	Temperature		0.01°C		
Performance	Conductivity	Repeatability	Within ±0.5% of the full scale (response for equivalent input) Within ±5% of the full scale in the range of 2000 µS/cm or 200 mS/m for FS-01 sensor		
		Linearity	Within ±0.5% of the full scale (response for equivalent input) Within ±5% of the full scale in the range of 2000 µS/cm or 200 mS/m for FS-01 sensor		
	TDS conversion	Repeatability	Within ±1.5% of the full scale (response for equivalent input)		
		Linearity	Within ±1.5% of the full scale (response for equivalent input)		
	Temperature	Repeatability	±0.1°C (response for equivalent input)		
		Linearity	±0.5°C (response for equivalent input)		
Transmission output	Number of output		2 (The negative terminals for transmission outputs are internally connected at the same electric potential)		
	Output type		4 mA to 20 mA DC: input/output isolated type		
	Load resistance		Maximum: 900 Ω		
	Linearity		Within ±0.08 mA (output only)		
	Repeatability		Within ±0.02 mA (output only)		
	Output range	Output 1	Conductivity: Free setting within a measuring range.		
		Output 2	Temperature: Free setting within a range between -10°C and 160°C		
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA		
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.		
Contact output	Number of output		3		
	Output type		No-voltage contact output		
	Contact type		Relay contact; SPDT (1c)		
	Output capacity		250 VAC 3 A, 30 VDC 3 A (resistance load)		
	Contact function	R1, R2	Selectable from upper limit alarm, lower limit alarm, USP conductivity requirement, and currently holding of transmission output. (The contact is closed during alarm operation, opened normally and while the power is down.)		
		FAIL	Error alarm (Closed in the normal state, opened in the failure state or while the power is down.)		
	Alarm setting range		• Setting range: within a measuring range • Delay time: 0 to 600 seconds		
Contact input	Number of input		1		
	Contact type		No-voltage "a" contact for open collector		
	Conditions		ON resistance: 100 Ω max. Open voltage: 24 VDC Short-circuit current: 12 mA DC max.		
	Contact function		External input for transmission holding.		
Communication function	Communication type		RS-485		
	Signal type		2 wire system, isolated from the input circuit Not isolated from transmission circuit		

Temperature compensation	Temperature element	Platinum resistor: 1 kΩ (0°C)
	Temperature compensation	• Temperature characteristic of NaCl (reference temperature: 5ºC to 95ºC) • Arbitrary temperature coefficient input (reference temperature: 5ºC to 95ºC; temperature coefficient: ±3%/ºC) • No temperature compensation One of the three ways of compensation is selectable. (In the de-ionized water area, the temperature compensation for pure water is automatically performed in both NaCl and arbitrary temperature coefficient compensation settings.)
	Temperature compensation range	0°C to 100°C (However, the compensation calculation is extended lower than 0°C or higher than 100°C.)
	Temperature calibration	1 point calibration comparing to reference thermometer
Calibration	Conductivity	Based on parameter input of coefficient for the sensor cell constant.
	TDS conversion	Conversion by user-defined coefficient value (TDS calculation is 0.30 to 1.00 times of sample conductivity by µS/cm.)
Self-check	Sensor diagnosis error	Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Meter error	CPU error, ADC error, and memory error
Operating temperature range		-20°C to 55°C (without freeze)
Operating humidity range		Relative humidity: 5% to 90% (without condensation)
Storage temperature		-25°C to 65°C
Power supply	Rated power supply	100 V to 240 V AC ±10% 50/60 Hz
	Power consumption	15 VA (max)
	Others	With power switch for maintenance use
Compatible standards	CE marking (*Note 3)	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rules	Part15 Class A
Structure	Installation	Outdoor installation type
	Installation method	Mounted on 50 A pole or wall
	Protection code	IP65
	Case material	Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings	SUS304
	Material of hood	SUS304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window	Polycarbonate
	Display element	Reflective monochrome LCD
External dimensions		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass		Main body: Approx. 3.5 kg; cover and fittings: Approx. 1 kg

Note 1: Conductivity measurement and TDS conversion measurement cannot be selected at the same time.

Note 2: Only the sanitary sensor (FS-01 series) is applied.

Note 3: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note : An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

HE-300C Specification

Product name			Conductivity meter		
Model			HE-300C		
Combined sensor			2-electrode method conductivity sensor ESH, ESD, ESL, and FS Series sensor of cell constant 0.01/cm, 0.1/cm, or 1.0/cm		
Measuring range	Cell constant (/cm)		0.01 (ESH/ESD/ESL-001)	0.1 (ESH/ESD/ESL/FS-01)	1.0 (ESH/ESD/ESL-1)
	Conductivity (μS/cm) (*Note 1)		0.000 to 2.000 0.00 to 10.00	0.000 to 2.000 0.00 to 20.00 0.0 to 100.0	0.0 to 200.0 0 to 1000
	Conductivity (mS/m) (*Note 1)		0.0000 to 0.2000 0.000 to 1.000	0.0000 to 0.2000 0.000 to 2.000 0.00 to 10.00	0.00 to 20.00 0.0 to 100.0
	TDS conversion (mg/L) (*Note 1)		0.00 to 2.00 0.0 to 10.0	0.00 to 2.00 0.0 to 20.0 0 to 100	0 to 200 0 to 1000
	Temperature		0°C to 100°C (Display range: -10°C to 160°C)		
Display resolution	Conductivity/ TDS conversion		As shown in the measuring table.		
	Temperature		0.01°C		
Performance	Conductivity	Repeatability	Within ±0.5% of the full scale (response for equivalent input)		
		Linearity	Within ±0.5% of the full scale (response for equivalent input)		
	TDS conversion	Repeatability	Within ±1.5% of the full scale (response for equivalent input)		
		Linearity	Within ±1.5% of the full scale (response for equivalent input)		
	Temperature	Repeatability	±0.1°C (response for equivalent input)		
		Linearity	±0.5°C (response for equivalent input)		
Transmission output	Output type		4 mA to 20 mA DC: input/output isolated type		
	Load resistance		Maximum: 600 Ω Case of 24 V DC power supply (*Note 2)		
	Linearity		Within ±0.08 mA (output only)		
	Repeatability		Within ±0.02 mA (output only)		
	Output range		Conductivity: Free setting within a measuring range.		
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA		
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.		
Contact input	Number of inputs		1		
	Contact type		No-voltage "a" contact for open collector		
	Conditions		ON resistance: 40 Ωmax. Open voltage: 1.2 VDC Short-circuit current: 21 mA DC max.		
	Contact function		External input for transmission holding.		
Temperature compensation	Applicable temperature element		Platinum resistor: 1 kΩ (0°C)		
	Temperature compensation		• Temperature characteristic of NaCl (reference temperature: 5°C to 95°C) • Arbitrary temperature coefficient input (reference temperature: 5°C to 95°C; temperature coefficient: ±3%/°C) • No temperature compensation One of the three ways of compensation is selectable. (In the de-ionized water area, the temperature compensation for pure water is automatically performed in both NaCl and arbitrary temperature coefficient compensation settings.)		
	Temperature compensation range		0°C to 100°C (However, the compensation calculation is extended lower than 0°C or higher than 100°C.)		
	Temperature calibration		1 point calibration comparing reference thermometer		
Calibration	Conductivity		Based on parameter input of coefficient for the sensor cell constant.		
	TDS conversion		Conversion by user-defined coefficient value (TDS calculation is 0.30 to 1.00 times of sample conductivity by μS/cm.)		
Self-check	Sensor diagnosis error		Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range		
	Meter error		CPU error, ADC error, and memory error		

Operating temperature range		-20°C to 60°C (without freeze)	
Operating humidity range		Relative humidity: 5% to 90% (without condensation)	
Storage temperature		-25°C to 65°C	
Power supply	Power supply voltage range	24 V DC (21 V to 32 V)	
	Power consumption	0.6 W (max.)	
Compatible standards	CE marking (*Note 3)	EMC: EN61326-1 Class A, Industrial electromagnetic environment RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments	
	FCC Rules	Part15 CLASS A	
Structure	Installation	Outdoor installation type	
	Installation method	Mounted on 50 A pole or wall	
	Protection code	IP65	IEC60529, JIS C0920
	Case material	Aluminum alloy (coated with epoxy-denatured melamine resin)	
	Material of fittings	SUS304	
	Material of hood	SUS304 stainless steel (coated with epoxy-denatured melamine resin)	
	Material of window	Polycarbonate	
	Display element	Reflective monochrome LCD	
External dimensions		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)	
Mass		Main body: Approx. 2.8 kg; cover and fittings: Approx. 1 kg	

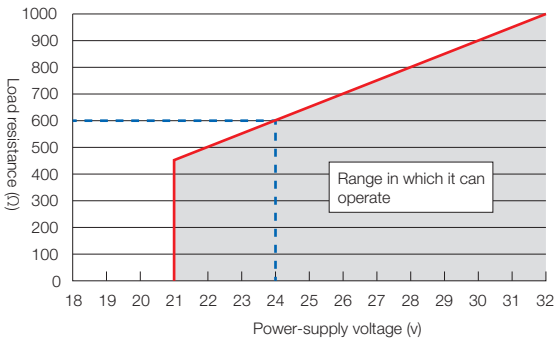
Note 1: Conductivity measurement and TDS conversion measurement cannot be selected at the same time.

Note 2: The maximum load resistance that can be connected is decided depending on the power-supply voltage.

Note 3: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note : An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

Relation between power-supply voltage and load resistance



HE-300C-IS Specification

Product name			Intrinsically safe explosion proof Conductivity meter							
Model			HE-300C-IS							
Approved sensor			2-electrode method conductivity sensor (*Note 1) ESH, ESD, ESL, and FS Series sensor of cell constant 0.01/cm, 0.1/cm, or 1.0/cm							
	Type of approved conductivity sensor		Conductivity sensor (Titanium)	ESH	-1 -01 -001	-L -C	-T	-ST -LG	-Y -O	-XXM
			Insertion type sensor (SUS316L)	ESH-01-C-S-SN-1.5S ESH-01-C-S-SN-2.0S						
			Flow-through sensor (SUS316L)	FS-01F-C-L-15A, FS-01F-C-L-1.0S FS-01F-C-L-1.5S, FS-01F-C-L-2.0S FS-01F-C-L-2.5S						
Measuring range	Cell constant (/cm)		0.01 (ESH-001)	0.1 (ESH-01 / FS-01)	1.0 (ESH-1)					
	Conductivity (µS/cm)		0.000 to 2.000 0.00 to 10.00	0.000 to 2.000 0.00 to 20.00 0.0 to 100.0	0.0 to 200.0 0 to 1000					
	Conductivity (mS/m)		0.0000 to 0.2000 0.000 to 1.000	0.0000 to 0.2000 0.000 to 2.000 0.00 to 10.00	0.00 to 20.00 0.0 to 100.0					
	TDS conversion (mg/L)		0.00 to 2.00 0.0 to 10.0	0.00 to 2.00 0.0 to 20.0 0 to 100	0 to 200 0 to 1000					
	Temperature		0°C to 100°C (Display range: -10°C to 160°C)							
Display resolution	Conductivity/ TDS conversion		As shown in the measuring table.							
	Temperature		0.01°C							
Performance	Conductivity	Repeatability	Within ±0.5% of the full scale (response for equivalent input)							
		Linearity	Within ±0.5% of the full scale (response for equivalent input)							
	TDS conversion	Repeatability	Within ±1.5% of the full scale (response for equivalent input)							
		Linearity	Within ±1.5% of the full scale (response for equivalent input)							
	Temperature	Repeatability	±0.1°C (response for equivalent input)							
		Linearity	±0.5°C (response for equivalent input)							
Transmission output	Output type		4 mA to 20 mA DC: input/output isolated type							
	Load resistance		Maximum: 650 Ω Case of 24 V DC power supply (*Note 2)							
	Linearity		Within ±0.08 mA (output only)							
	Repeatability		Within ±0.02 mA (output only)							
	Output range		Conductivity: Free setting within a measuring range.							
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA							
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.							
Temperature compensation	Applicable temperature element		Platinum resistor: 1 kΩ (0°C)							
	Temperature compensation		• Temperature characteristic of NaCl (reference temperature: 5°C to 95°C) • Arbitrary temperature coefficient input (reference temperature: 5°C to 95°C; temperature coefficient: ±3%/°C) • No temperature compensation One of the three ways of compensation is selectable. (In the de-ionized water area, the temperature compensation for pure water is automatically performed in both NaCl and arbitrary temperature coefficient compensation settings.)							
	Temperature compensation range		0°C to 100°C (However, the compensation calculation is extended lower than 0°C or higher than 100°C.)							
	Temperature calibration		1 point calibration comparing reference thermometer							
Calibration	Conductivity		Based on parameter input of coefficient for the sensor cell constant.							
	TDS conversion		Conversion by user-defined coefficient value (TDS calculation is 0.30 to 1.00 times of sample conductivity by µS/cm.)							
Self-check	Sensor diagnosis error		Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range							
	Meter error		CPU error, ADC error, and memory error							
Operating temperature range			-20°C to 55°C (without freeze)							
Operating humidity range			Relative humidity: 5% to 90% (without condensation)							
Storage temperature			-25°C to 65°C							

Power supply	Power supply voltage range		24 V DC (22 V to 28.3 V) (*Note 3)	
	Power consumption		0.6 W (max.)	
Explosion-proof construction	Explosion-proof construction as specified in TIIS of Japan		Intrinsically safety Product name	Ex ia II C T4 X Conductivity meter
			Official approval number	TC20348
		intrinsic safety rating	Maximum input voltage	Ui 28.3 V
			Maximum input current	Ii 93.3 mA
			Maximum input power	Pi 0.66 W
			Maximum internal inductance	Li Negligible value
			Maximum internal capacitance	Ci 1 nF
Structure	Installation		Outdoor installation type	
	Installation method		Mounted on 50 A pole or wall	
	Protection code		IP65	
	Case material		Aluminum alloy (coated with epoxy-denatured melamine resin)	
	Material of fittings		SUS304	
	Material of hood		SUS304 stainless steel (coated with epoxy-denatured melamine resin)	
	Material of window		Polycarbonate	
	Display element		Reflective monochrome LCD	
External dimensions			180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)	
Mass			Main body: Approx. 2.8 kg; cover and fittings: Approx. 1 kg	

Note 1: The conductivity sensor listed in the approved sensor can be connected to the conductivity meter for intrinsically safe apparatus.

Note 2: The maximum load resistance to pick up signal depends on the power supply voltage and combination of barriers. The meshed areas shown in Fig.1 to 3 are the load resistance applicable.

Note 3: The maximum power supply voltage rating to the barrier is not the rating of the conductivity meter. Supply power to the barrier within the rating of the barrier.

Relation between power-supply voltage and load resistance

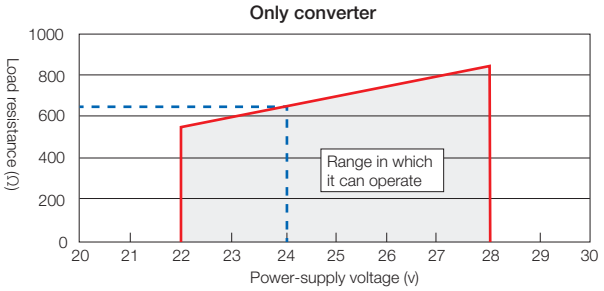


Fig. 1: Power supply voltage in converter simple substance, and relation of load resistance.

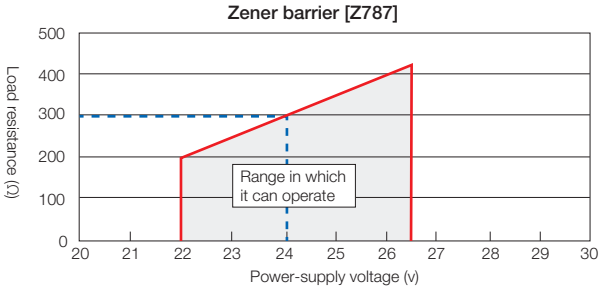


Fig. 2: Power supply voltage at the time of combining Zener barrier with converter, and relation of load resistance.

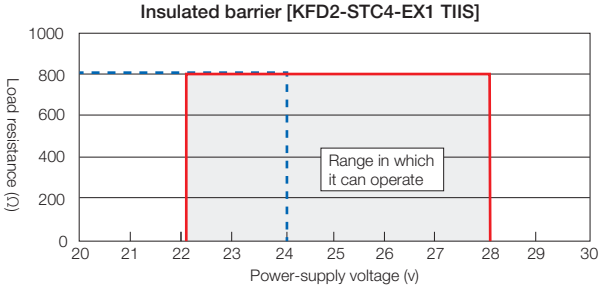
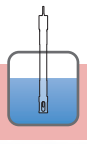
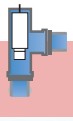


Fig. 3: Power supply voltage at the time of combining insulated barrier with converter, and relation of load resistance.





HE-200H Specification

Product name			Conductivity meter		
Model			HE-200H		
Combined sensor			4-electrode method conductivity sensor (FES Series) of cell constant 0.1/cm, or 1.0/cm		
Measuring range			Cell constant	0.1/cm (FES-210, 310 series)	1.0/cm (FES-125, 126)
	Conductivity	mS/cm	0.000 to 2.000	○	○
			0.00 to 20.00	○	○
			0.0 to 200.0	○	○
			0 to 2000	△ (*Note 2)	△ (*Note 2)
			AUTO (*Note 1)	○	○
			Practical region (*Note 2)	0 to 500	0 to 1000
			Display range	0 to 2200	
		S/m	0.0000 to 0.2000	○	○
			0.000 to 2.000	○	○
			0.00 to 20.00	○	○
			0.0 to 200.0	△ (*Note 2)	△ (*Note 2)
			AUTO (*Note 1)	○	○
			Practical region (*Note 2)	0.0 to 50.0	0.0 to 100.0
			Display range	0.0 to 220.0	
	Temperature		0.00°C to 100.00°C (Display range: -30°C to 160°C)		
Salinity conversion function	Seawater		0.00% to 4.00%		
	NaCl		0.0% to 20.0%		
Conversion to concentration	NaOH		0.00% to 5.00%		
	HNO_3		0.00% to 5.00%		
	H_3PO_4		0.00% to 5.00%		
	Option 1 to 4		0.00% to 100.00%		
Display resolution	Conductivity/ Conversion density		As shown in the measuring and conversion table.		
	Temperature		0.01°C		
Performance	Conductivity	Repeatability (mS/cm)		0.1 (/cm)	1.0 (/cm)
			0 to 20.00	Within ±0.5% of the full scale	Within ±0.5% of the full scale
			20.0 to 200.0	Within ±1.0% of the full scale	Within ±0.5% of the full scale
			200 to 1000	–	Within ±1.0% of the full scale
			Condition	response for equivalent input	
		Linearity (mS/cm)		0.1 (/cm)	1.0 (/cm)
			0 to 20.00	Within ±0.5% of the full scale	Within ±0.5% of the full scale
			20.0 to 200.0	Within ±1.0% of the full scale	Within ±0.5% of the full scale
			200 to 1000	–	Within ±1.0% of the full scale
			Condition	response for equivalent input	
	Temperature	Repeatability	±0.1°C (response for equivalent input)		
		Linearity	±0.5°C (response for equivalent input)		
Transmission output	Number of output		2 (The negative terminals for transmission outputs are internally connected at the same electric potential)		
	Output type		4 mA to 20 mA DC: input/output isolated type		
	Load resistance		Maximum: 900 Ω		
	Linearity		Within ±0.08 mA (output only)		
	Repeatability		Within ±0.02 mA (output only)		
	Output range	Output 1	Conductivity or density converted: Free setting within a measuring range.		
		Output 2	Temperature: Free setting within a range between -30°C and 160°C		
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA		
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.		
Contact output	Number of output		3		
	Output type		No-voltage contact output		
	Contact type		Relay contact; SPDT (1c)		
	Output capacity		250 VAC 3 A, 30 VDC 3 A (resistance load)		
	Contact function	R1, R2	Selectable from upper limit alarm, lower limit alarm, and currently holding of transmission output. (The contact is closed during alarm operation, opened normally and while the power is down.)		
		FAIL	Error alarm (Closed in the normal state, opened in the failure state or while the power is down.)		

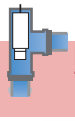
Contact output	Alarm setting range	Selectable from conductivity and density • Setting range: Within a measuring range • Delay time: 0 to 600 seconds
Contact input	Number of input	2
	Contact type	No-voltage "a" contact for open collector
	Conditions	ON resistance: 100 Ω max. Open voltage: 24 VDC Short-circuit current: 12 mA DC max.
	Function of input	The input signal use can be changed. Two inputs for four output current range selection, or, one input for two current range selection and one input for holding. The display also responds for the range selection by input.
Communication function	Communication type	RS-485
	Signal type	2 wire system, isolated from the input circuit Not isolated from transmission circuit
Temperature compensation	Temperature element	Platinum resistor: 1 kΩ (0°C)
	Temperature compensation	• Temperature characteristic of NaCl (reference temperature: 5°C to 95°C) • Arbitrary temperature coefficient input (reference temperature: 5°C to 95°C; temperature coefficient: ±3%/°C) • No temperature compensation One of the three ways of compensation is selectable.
	Temperature compensation range	0°C to 100°C (However, the compensation calculation is extended lower than 0°C or higher than 100°C.)
	Temperature calibration	1 point calibration comparing to reference thermometer
Calibration	Conductivity	Based on parameter input of coefficient for the sensor cell constant.
Self-check	Sensor diagnosis error	Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range
	Converter error	CPU error, ADC error, and memory error
Operating temperature range		-20°C to 55°C (without freeze)
Operating humidity range		Relative humidity: 5% to 90% (without condensation)
Storage temperature		-25°C to 65°C
Power supply	Rated power supply voltage	100 V to 240 V AC ±10% 50/60 Hz
	Power consumption	15 VA (max.)
	Others	With power switch for maintenance use
Compatible standards	CE marking (*Note 3)	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rules	Part15 Class A
Structure	Installation	Outdoor installation type
	Installation method	Mounted on 50 A pole or wall
	Protection code	IP65
	Case material	Aluminum alloy (coated with epoxy-denatured melamine resin)
	Material of fittings	SUS304
	Material of hood	SUS304 stainless steel (coated with epoxy-denatured melamine resin)
	Material of window	Polycarbonate
	Display element	Reflective monochrome LCD
External dimensions		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)
Mass		Main body: Approx. 3.5 kg; cover and fittings: Approx. 1 kg

Note 1: The decimal point position changes automatically

Note 2: The actual limit of measuring range of raw conductivity is 500 mS/cm for 0.1/cm and 2000 mS/cm for 1/cm sensor. (The sensor durability for chemicals is not assumed.)

Note 3: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note : An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.



Flow-through type

HE-480C Specification

Product name		Industrial conductivity meter		
Model		HE-480C		
Measurement method		Electrode type (2-electrode method)		
Cell constant		0.01/cm, 0.1/cm, or 1.0/cm		
Temperature sensor specifications		Platinum resistance 1000 Ω/0°C; temperature coefficient 3750 ppm/°C standard		
Measuring range	Cell constant (/cm)	0.01 (ESH/ESD/ESL-001)	0.1 (ESH/ESD/ESL/FS-01)	1.0 (ESH/ESD/ESL-1)
	Measurement range (µS/cm)	2.000/20.00	20.00/200.0	200.0/2000
	Measurement range (mS/m)	0.2000/2.000	2.000/20.00	20.00/200.0
	TDS conversion (mg/L)	2.00/20.0	20.0/200	200/2000
		0°C to 100°C (The displayed decimal place is selectable among 0, 1,and 2.)		
Repeatability Within	Conductivity display	Within ±0.5% of the full scale		(in equivalent input)
	TDS conversion display	Within ±1.5% of the full scale		
Linearity Within	Conductivity display	Within ±0.5% of the full scale		(in equivalent input)
	TDS conversion display	Within ±1.5% of the full scale		
Transmission output		4 mA to 20 mA DC: input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range		
Contact output		Outputs: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.		
Calibration function		Conductivity: Based on the specified compensation coefficient for the cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer TDS: Conversion using a user-defined coefficient value (0.30 to 1.00)		
Transmission output hold feature		• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the previous value hold is available in the maintenance Mode.)		
Self-diagnosis function		• Sensor diagnosis Short-circuit and disconnection of the temperature sensor • Out of the measurement range • A/D converter scale over • Converter error		
Temperature compensation		• Based on the temperature characteristics of extra deionized water (reference temperature: 25°C) • Based on the reference temperature and user-defined temperature coefficient (reference temperature: 5°C to 95°C, temperature coefficient ±5%/°C) • Based on the temperature characteristics of NaCl • No temperature compensation		

Temperature-compensated range		0°C to 100°C
Ambient temperature		-5°C to 45°C
Relative humidity		20% to 85% (without dew condensation)
Storage temperature		-25°C to 65°C
Power supply		Rated voltage 100 V to 240 V AC, 50/60 Hz, 10 VA (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)
Conforming standards	CE Marking	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)
Mass		Approx. 400 g
Compatible sensors		ESH, ESD, ESL, and FS-series conductivity sensor; cell constant: 0.01/cm, 0.1/cm, or 1.0/cm

HE-480C-DC24V Specification

Product name		Industrial conductivity meter		
Model		HE-480C-DC24V		
Measurement method		Electrode type (2-electrode method)		
Cell constant		0.01/cm, 0.1/cm, or 1.0/cm		
Temperature sensor specifications		Platinum resistance 1000 Ω/0°C		
Measuring range	Cell constant (/cm)	0.01 (ESH/ESD/ESL-001)	0.1 (ESH/ESD/ESL/FS-01)	1.0 (ESH/ESD/ESL-1)
	Measurement range (μS/cm)	2.000/20.00	20.00/200.0	200.0/2000
	Measurement range (mS/m)	0.2000/2.000	2.000/20.00	20.00/200.0
	TDS conversion (mg/L)	2.00/20.0	20.0/200	200/2000
		0°C to 100°C (The displayed decimal place is selectable among 0, 1,and 2.)		
Repeatability Within	Conductivity display	Within ±0.5% of the full scale		(in equivalent input)
	TDS conversion display	Within ±1.5% of the full scale		
Linearity Within	Conductivity display	Within ±0.5% of the full scale		(in equivalent input)
	TDS conversion display	Within ±1.5% of the full scale		
Transmission output		4 mA to 20 mA DC: input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range		
Contact output		Outputs: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.		
Calibration function		Conductivity: Based on the specified compensation coefficient for the cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer TDS: Conversion using a user-defined coefficient value (0.30 to 1.00)		
Transmission output hold feature		• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the previous value hold is available in the maintenance Mode.)		
Self-diagnosis function		• Sensor diagnosis Short-circuit and disconnection of the temperature sensor • Out of the measurement range • A/D converter scale over • Converter error		
Temperature compensation		• Based on the temperature characteristics of extra deionized water (reference temperature: 25°C) • Based on the reference temperature and user-defined temperature coefficient (reference temperature: 5°C to 95°C, temperature coefficient ±5%/°C) • Based on the temperature characteristics of NaCl • No temperature compensation		

Temperature compensated range		0°C to 100°C
Ambient temperature		-5°C to 45°C
Relative humidity		20% to 85% (without dew condensation)
Storage temperature		-25°C to 65°C
Power supply		Rated voltage 24 V DC, 5 W (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00
Conforming standards	CE Marking	EMC: EN61326-1 Class A, Industrial electromagnetic environment RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)
Mass		Approx. 400 g
Compatible sensors		ESH, ESD, ESL, and FS-series conductivity sensor; cell constant: 0.01/cm, 0.1/cm, or 1.0/cm

HE-960CW Specification

Product name			Industrial 2-channel conductivity meter		
Model			HE-960CW		
Measurement method			Electrode type (2-electrode method)		
Sensor input			2 channels (for concurrent measurement with sensors isolated each other)		
Cell constant			0.01/cm, 0.1/cm, or 1.0/cm		
Temperature sensor specifications			Platinum resistance 1000 Ω/0°C		
Measuring range	Cell constant (/cm)		0.01 (ESD/ESL/ESH-001)	0.1 (ESD/ESL/ESH/FS-01)	1.0 (ESD/ESL/ESH-1)
	Conductivity Range	(μS/cm)	2.000/20.00	2.000/20.00/200.0/2000	200.0/2000
		(mS/m)	0.2000/2.000	0.2000/2.000/20.00/200.0	20.00/200.0
	TDS conversion	(mg/L)	2.000/20.00	2.000/20.00/200.0/2000	200.0/2000
	*: Applicable for only sanitary sensor (FS-01 series)				
	Temperature		0°C to 100°C		
	Desalination rate		0.0% to 100.0%		
	Conductivity difference		Depends on measurement range of sensor 2 (CH2)		
Repeatability	Conductivity display		Within ±0.5% of the full scale (in equivalent input) 2000 μS/cm and 200.0 mS/m ranges of FS-01: Within ±2% of the full scale		
	TDS conversion display		Within ±1.5% of the full scale (in equivalent input)		
Linearity	Conductivity display		Within ±0.5% of the full scale (in equivalent input) 2000 μS/cm and 200.0 mS/m ranges of FS-01: Within ±2% of the full scale		
	TDS conversion display		Within ±1.5% of the full scale (in equivalent input)		
Display/ output range	Conductivity		Measurement range		
	Temperature		-30°C to 160°C		
	Desalination rate		0% to 100%		
	Conductivity difference		Measurement range of sensor 2 (CH2)		
Transmission output			Number of outputs: 4 4 mA to 20 mA DC/0 mA to 20 mA DC, input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range (Negative terminals of each transmission output channel are connected inside and thus have the same electric potential.)		
Contact output			Number of outputs: 4 Alarm contact outputs (R1, R2, and R3) Contact type: relay contact, SPST (1a) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from the upper/lower limit action (ON/OFF control), delay, and hysteresis Output contents: selectable from the selected measurement, USP assessment, anomaly alarm, and maintenance. Alarm contact output (R4) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from the upper/lower limit action (ON/OFF control), delay, and hysteresis Output contents: selectable from the selected measurement, USP assessment, anomaly alarm, and maintenance. (However, R1 and R2, and R3 and R4 share the common contacts respectively.) Contact operation (operation between C and NO for R1 to R4) When selected measurement, USP assessment, or maintenance is selected in output contents: Contact point becomes "CLOSE" at control operation and "OPEN" at normal state (including power shutdown) When anomaly alarm is selected in output contents: Contact point becomes "CLOSE" at normal state and "OPEN" at anomaly state (including power shutdown) (When between C and NC is used with R4, contact point becomes reverses state with that of between C and NO.)		
Communication output			RS-485 input/output		
Calibration function			Conductivity: Based on the specified compensation coefficient for cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer TDS: Conversion using a user-defined coefficient value (0.30 to 1.00)		
Transmission output hold feature			Previous value hold Optional value hold Selectable from the above (However, only the previous value hold is available in the maintenance mode.)		
Self-diagnosis function			Sensor diagnosis Short-circuit and disconnection of the temperature sensor Out of the measurement range Converter error		

Temperature compensation		Temperature characteristic of NaCl (reference temperature: 5°C to 95°C) Arbitrary temperature coefficient entry (reference temperature: 5°C to 95°C; temperature coefficient: ±5%/°C) (In the deionized water area, however, the temperature compensation for deionized water is automatically performed in both NaCl and arbitrary temperature coefficient compensation settings.) No temperature compensation
Temperature-compensated range		0°C to 100°C
Ambient Temperature		-5°C to 55°C
Relative humidity		20% to 85% (without dew condensation)
Storage temperature		-25°C to 65°C
Power supply		Rated voltage 100 V to 240 V AC, 50/60 Hz, 25 VA (maximum)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)
Conforming standards	CE Marking	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		96 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)
Mass		Approx. 550 g

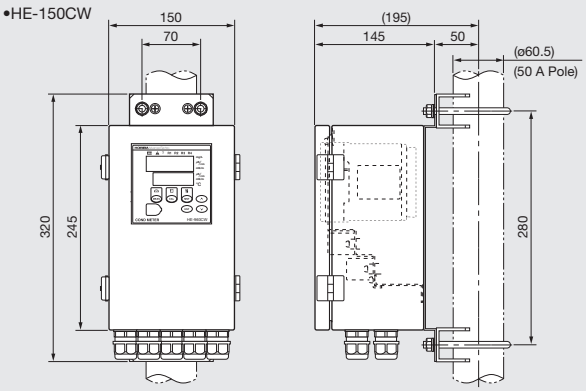
	Sensor type	Model	Cell constant (/cm)	Temperature coefficient of temperature sensor (ppm/°C)
Compatible sensors	Insert type	ESD/ESL series	0.01, 0.1, 1.0	3750
		ESH series	0.01, 0.1, 1.0	3850
	Sanitary insert type	ESD-01C-SN1.5	0.1	3750
		ESH-01C-SN1.5	0.1	3850
	Sanitary flow-through type	FS-01C-SL series	0.1	3750
		FS-01FC-SL series	0.1	3850

HE-150CW Specification

Model	HE-150CW
Ambient temperature	-5 to 55°C
Relative humidity	20 to 85% (without condensation)
Storage temperature	-25 to 65°C
IP Code	IP65 (for indoor use)
Material	Case/fitting: SUS304 Packing: EPDM Clear plate: PMMA
Terminal screw	M3.5
External dimensions	150 (W) mm x 320 (H) mm x 145 (D) mm
Mass	Approx. 4.5 kg

Dimensions (Unit: mm)

•HE-150CW



HE-960CW-P Specification

Product name			2-channel conductivity meter		
Model			HE-960CW-P		
Measurement method			Electrode type (2-electrode method)		
Sensor input			2 channels (for concurrent measurement with sensors isolated each other)		
Cell constant			0.01/cm, 0.1/cm, or 1.0/cm		
Temperature sensor specifications			Platinum resistance 1000 Ω/0°C		
Measuring range	Cell constant (/cm)		0.01 (ESD/ESL/ESH-001)	0.1 (ESD/ESL/ESH/FS-01)	1.0 (ESD/ESL/ESH-1)
	Conductivity Range	(µS/cm)	2.000/5.000/20.00	2.000/5.000/20.00/200.0/2000*	200.0/2000
		(mS/m)	0.2000/0.500/2.000	0.2000/0.500/2.000/20.00/200.0*	20.00/200.0
	TDS conversion	(mg/L)	2.000/5.000/20.00	2.000/5.000/20.00/200.0/2000*	200.0/2000
			Temperature compensation invalid: 0.000-5.000 µS/cm * Applicable for only sanitary sensor (FS-01 series)		
	Temperature		0°C to 100°C (Number of decimal places can select 1 or 2 digit)		
	Desalination rate		0.0% to 100.0%		
	Conductivity difference		Depends on measurement range of sensor 2 (CH2)		
Repeatability Linearity	Conductivity display		In case of 2.000/5.000 µS/cm (0.2000/0.5000 µS/m) 2.000 µS/cm and less: Within ±0.010 µS/cm (±0.0010 mS/m) 2.000 µS/cm over: Within ±0.5% of the reading scale In case of 20.00/200.0/2000 µ/cm (2.000/20.00/200.0 mS/m) Within ±0.2% of the full scale 2000 µS/cm (200.0 mS/m) of FS-01: Within ±2% of the full scale (in equivalent input as a sum of linearity and repeatability)		
	TDS conversion display		Within ±1.5% of the full scale (in equivalent input)		
Display/ output range	Conductivity		Measurement range		
	Temperature		-30°C to 160°C		
	Desalination rate		0% to 100%		
	Conductivity difference		Measurement range of sensor 2 (CH2)		
Transmission output			Number of outputs: 4 4 mA to 20 mA DC/0 mA to 20 mA DC, input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range (Negative terminals of each transmission output channel are connected inside and thus have the same electric potential.) Burn out function.		
Contact output			Number of outputs: 4 Alarm contact outputs (R1, R2, and R3) Contact type: relay contact, SPST (1a) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from the upper/lower limit action (ON/OFF control), delay, and hysteresis Inverted output possible for each output target. Abnormal alarm enable to set OR setting for each output. Output contents: selectable from the selected measurement, USP assessment, anomaly alarm, and maintenance. Alarm contact output (R4) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from the upper/lower limit action (ON/OFF control), delay, and hysteresis Output contents: selectable from the selected measurement, USP assessment, anomaly alarm, and maintenance. (However, R1 and R2, and R3 and R4 share the common contacts respectively.) Contact operation (operation between C and NO for R1 to R4) When selected measurement, USP assessment, or maintenance is selected in output contents: Contact point becomes “CLOSE” at control operation and “OPEN” at normal state (including power shutdown)		
Contact output			When anomaly alarm is selected in output contents: Contact point becomes “CLOSE” at normal state and “OPEN” at anomaly state (including power shutdown) (When between C and NC is used with R4, contact point becomes reverses state with that of between C and NO.)		
Communication output			RS-485 input/output		
Calibration function			Conductivity: Based on the specified compensation coefficient for cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer TDS: Conversion using a user-defined coefficient value (0.30 to 1.00)		
Transmission output hold feature			Previous value hold Optional value hold Burnout Selectable from the above (However, only the previous value hold is available in the maintenance mode.)		
Self-diagnosis function			Sensor diagnosis Short-circuit and disconnection of the temperature sensor Out of the measurement range Converter error <Conductivity sensor> Short: Burn out signal Open: Optional setting possible (Different setting range depending on measurement range.) Optional setting possible for delay time. (Both on and off) <Temperature sensor> Short, Open, Signal burn out		
Temperature compensation			• Temperature characteristic of NaCl (reference temperature: 5°C to 95°C) • Arbitrary temperature coefficient entry (reference temperature: 5°C to 95°C; temperature coefficient: ±5%/°C) (In the deionized water area, however, the temperature compensation for deionized water is automatically performed in both NaCl and arbitrary temperature coefficient compensation settings.) • No temperature compensation		
Temperature-compens ated range			0°C to 100°C		
Ambient Temperature			-5°C to 55°C		
Relative humidity			20% to 85% (without dew condensation)		
Storage temperature			-25°C to 65°C		
Power supply			Rated voltage 100 V to 240 V AC, 50/60 Hz, 25 VA (maximum)		
Structure			Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure		
Protective structure			Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)		
Conforming standards	CE Marking		EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments		
	FCC Rule		Part15 Class A		
External dimensions			96 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)		
Mass			Approx. 550 g		

	Sensor type	Model	Cell constant (/cm)	Temperature coefficient of temperature sensor (ppm/°C)
Compatible sensors	Insert type	ESD/ESL series	0.01, 0.1, 1.0	3750
		ESH series	0.01, 0.1, 1.0	3850
	Sanitary insert type	ESD-01C-SN1.5	0.1	3750
		ESH-01C-SN1.5	0.1	3850
	Sanitary flow-through type	FS-01C-SL series	0.1	3750
		FS-01FC-SL series	0.1	3850

HE-960HI Specification

Product name			Industrial conductivity meter	
Model			HE-960HI	
Measurement method			Electrode type (4-electrode method)	
Cell constant			0.1/cm	
Temperature sensor specifications			Platinum resistance 1000 Ω/ 0°C	
Measuring range	Conductivity		0 mS/cm to 200 mS/cm (measuring range of conductivity before temperature compensation: 0 mS/cm to 500 mS/cm)	
	Temperature		0.0°C to 100.0°C	
Concentration conversion	HNO_3	0% to 5.00%	Preprogrammed in the instrument	
	NaOH	0% to 5.00%		
	H_3PO_4	0% to 5.00%		
	Option 1	0% to 100.00%	Conversion formula is defined by user (temperature compensation and concentration conversion)	
	Option 2	0% to 100.00%		
Repeatability	0.000 mS/cm to 2.000 mS/cm		Within ±0.5% full scale	Using equivalent input for conductivity with 10 m cable.
	0.00 mS/cm to 20.00 mS/cm		Within ±0.5% full scale	
	0.0 mS/cm to 200.0 mS/cm		Within ±0.5% full scale	
	0 mS/cm to 500 mS/cm		Within ±1.0% full scale	
	0.0°C to 100.0°C		Within ±0.2°C	
Linearity	0.00 mS/cm to 20.00 mS/cm		Within ±0.5% full scale	Using equivalent input for conductivity with 10 m cable.
	0.0 mS/cm to 200.0 mS/cm		Within ±1.0% full scale	
	0 mS/cm to 500 mS/cm		Within ±2.0% full scale	
	0.0°C to 100.0°C		Within ±0.5°C	
Display and output range	Conductivity		0 mS/cm to 2000 mS/cm	
	Temperature		-30°C to 160°C	
	Concentration		0% to 5%: NaOH, HNO_3, H_3PO_4 0% to 100%: Concentration of the component in the optional conversion formula set by user	
Transmission output			Number of output: 4 4 to 20 mA DC: input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Free setting within the measurement range (Negative terminals of each transmission output channel are connected inside and thus have the same electrical potential.)	
Contact output			Number of relay: 5 ALARM contact R1, R2, R3 and R4 Contact type: relay contact, SPST (1a) Contact rating: 240 VAC, 1 A or 30 VDC, 1 A (resistance load) Contact function: Upper or lower ON/OFF alarm on each measurement items, conductivity, concentration, temperature, including delay time and hysteresis. Contact action: Closed when status is in the event. Opened when status is normal or power is down. R1, R2 and R3 share a common terminal. Self diagnosis contact RF Contact type: relay contact, SPDT (1c) Contact rating: 240 VAC, 1 A or 30 VDC, 1 A (resistance load) C-NO contact action: Closed when status is normal. Opened when any erroneous status is detected or power is down. R4 and RF share a common terminal.	
Contact input			Number of input: 2 Contact type: open collector, No-voltage contact Function; Two input signals can apply for analog output range selection or hold command. A couple of switching for two analog output ranges, or hold command and switching for one analog range.	
Communication output			RS-485 communication	
Calibration function			Conductivity: Cell constant input in the parameter input menu. Temperature: By comparing with the reference thermometer.	
Transmission output hold feature			Selectable from the Previous value hold and the Optional value hold in CAL mode. (However, only the previous value hold is available in MNT mode.)	

Self-diagnosis function		• Sensor diagnosis Short-circuit and disconnection of the temperature sensor • Converter error
Temperature compensation of conductivity		• Temperature characteristics of NaCl (reference temperature: 25°C) • Arbitrary temperature coefficient entry (reference temperature: 25°C, temperature coefficient: 0 to 5%/°C) • No temperature compensation is performed.
Ambient temperature		-5 to 55°C
Relative humidity		20 to 85% (without dew condensation)
Storage temperature		-25 to 65°C
Power supply		Rated voltage 100 to 240 V AC, 50/60 Hz, 20 VA (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Jack sockets sealed with rubber plug Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)
Conforming standards	CE Marking	EMC: EN61326-2-3 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		96 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)
Mass		Approx. 550 g
Compatible sensors		Submersible FES-210, FES-220, FES-230, FES-240 series sanitary four-electrode conductivity sensor Flow-through FES-310 series sanitary four-electrode conductivity sensor

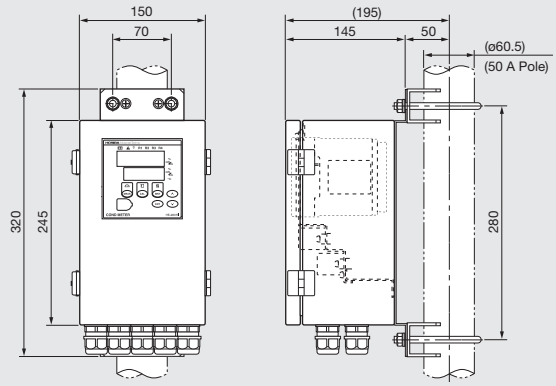
HE-150HI Specification

Model	HE-150HI
Ambient temperature	-5 to 55°C
Relative humidity	20 to 85% (without condensation)
Storage temperature	-25 to 65°C
IP Code	IP65 (for indoor use)
Material	Case/fitting: SUS304 Packing: EPDM Clear plate: PMMA
Terminal screw	M3.5
External dimensions	150 (W) mm x 320 (H) mm x 145 (D) mm
Mass	Approx. 4.5 kg

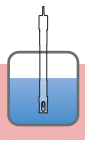
< Specification of transmitter >
Refer to Product Spec, P420298

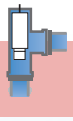
Dimensions (Unit: mm)

•HE-150HI



Transmitter





HE-480H Specification

Product name		Industrial conductivity meter		
Model		HE-480H		
Measurement method		Electrode type (4-electrode method)		
Cell constant		1.0/cm		
Measuring range	Measurement range (S/m)	0.000 to 2.000	0.00 to 20.00	0.00 to 50.00
	Measurement range (mS/cm)	0.00 to 20.00	0.0 to 200.0	0.0 to 500.0
	Seawater salinity conversion value (%)	0.00 to 4.00		
	NaCl salinity conversion value (%)	0.0 to 20.0		
		0°C to 100°C (The displayed decimal place is selectable among 0, 1, and 2.)		
Repeatability Within	Conductivity display	Within ±0.5% of the full scale	(in equivalent input)	
	Salinity conversion display	Within ±1% of the full scale		
Linearity Within	Conductivity display	Within ±0.5% of the full scale	(in equivalent input)	
	Salinity conversion display	Within ±1% of the full scale		
Transmission output		4 mA to 20 mA DC: input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range		
Contact output		Outputs: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.		
Calibration function		Conductivity: Based on the specified compensation coefficient for the cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer		
Transmission output hold feature		• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the previous value hold is available in the maintenance Mode.)		
Self-diagnosis function		• Sensor diagnosis Short-circuit and disconnection of the temperature sensor • Out of the measurement range • A/D converter scale over • Converter error		
Temperature compensation		• Temperature characteristics of NaCl • Freely selectable reference temperature and temperature coefficient		

Measurement range	Reference temperature	Temperature coefficient
0.000 S/m to 2.000 S/m (0.00 mS/cm to 20.00 mS/cm)	5°C to 95°C	±5%/°C
0.00 S/m to 20.00 S/m (0.0 mS/cm to 200.0 mS/cm)	25°C	±3.5%/°C
0.00 S/m to 50.00 S/m (0.0 mS/cm to 500.0 mS/cm)	No temparature compensation	

• No temperature compensation

Temperature-compensated range		0°C to 100°C
Ambient temperature		-5°C to 45°C
Relative humidity		20% to 85% (without dew condensation)
Storage temperature		-25°C to 65°C
Power supply		Rated voltage 100 V to 240 V AC, 50/60 Hz, 10 VA (max.)
Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)
Conforming standards	CE Marking	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)
Mass		Approx. 400 g
Compatible sensors		FES series conductivity sensor, cell constant 100/m (1.0/cm) (The measurement range differs depending on the sensor model.)

* Sensors and measurement ranges

Sensor model		FES-125/125F	FES-126/126F
Measurement range	0.000 S/m to 2.000 S/m (0.00 mS/cm to 20.00 mS/cm)	✓	✓
	0.00 S/m to 20.00 S/m (0.0 mS/cm to 200.0 mS/cm)	✓	✓
	0.00 S/m to 50.00 S/m (0.0 mS/cm to 500.0 mS/cm)	✓	✓
Seawater salinity conversion value	0.00% to 4.00%	✓	✓
NaCl salinity conversion value	0.0% to 20.0%	✓	✓
Temperature	0°C to 50°C	✓	✓
	0°C to 100°C		✓

HE-200R Specification

Product name			Resistivity meter	
Model			HE-200R	
Combined sensor			2-electrode method resistivity sensor (ERF-001 Series) of cell constant 0.01/cm	
Measuring range	Resistivity	MΩ · cm	0.000 to 2.000	0.00 to 20.00 (*Note 1)
		kΩ · m	0.00 to 20.00	0.0 to 200.0 (*Note 1)
	Temperature		0°C to 100°C (Display range: -10°C to 110°C)	
Display resolution	Resistivity		As shown in the measuring table.	
	Temperature		0.01°C	
Performance	Resistivity	Repeatability	Within ±0.1% of the full scale (response for equivalent input)	
		Linearity	Within ±0.5% of the full scale (response for equivalent input)	
	Temperature	Repeatability	±0.1°C (response for equivalent input)	
		Linearity	±0.5°C (response for equivalent input)	
Transmission output	Number of output		2 (The negative terminals for transmission outputs are internally connected at the same electric potential)	
	Output type		4 mA to 20 mA DC: input/output isolated type	
	Load resistance		Maximum: 900 Ω	
	Linearity		Within ±0.08 mA (output only)	
	Repeatability		Within ±0.02 mA (output only)	
	Output range	Output 1	Resistivity: Free setting within a measuring range.	
		Output 2	Temperature: Free setting within a range between -20°C and 130°C	
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA	
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.	
Contact output	Number of output		3	
	Output type		No-voltage contact output	
	Contact type		Relay contact; SPDT (1c)	
	Output capacity		250 VAC 3 A, 30 VDC 3 A (resistance load)	
	Contact function	R1, R2	Selectable from upper limit alarm, lower limit alarm, and currently holding of transmission output. (The contact is closed during alarm operation, opened normally and while the power is down.)	
		FAIL	Error alarm (Closed in the normal state, opened in the failure state or while the power is down.)	
	Alarm setting range		• Setting range: within a measuring range • Delay time: 0 to 600 seconds	
Contact input	Number of input		1	
	Contact type		No-voltage "a" contact for open collector	
	Conditions		ON resistance: 100 Ω max. Open voltage: 24 VDC Short-circuit current: 12 mA DC max.	
	Contact function		External input for transmission holding.	
Communication function	Communication type		RS-485	
	Signal type		2 wire system, isolated from the input circuit Not isolated from transmission circuit	
Temperature compensation	Temperature element		Platinum resistor: 1 kΩ (0°C)	
	Temperature compensation		• Temperature characteristic of NaCl (reference temperature: 5°C to 95°C) • Arbitrary temperature coefficient input (reference temperature: 5°C to 95°C; temperature coefficient: ±3%/°C) • No temperature compensation One of the three ways of compensation is selectable. (In the de-ionized water area, the temperature compensation for pure water is automatically performed in both NaCl and arbitrary temperature coefficient compensation settings.)	
	Temperature compensation range		0 °C to 100°C (However, the compensation calculation is extended lower than 0°C or higher than 100°C.)	
	Temperature calibration		1 point calibration comparing to reference thermometer	
Calibration	Resistivity		Based on parameter input of coefficient for the sensor cell constant.	
	Temperature		Comparison to the accurate thermometer Both deviation and coefficient of RTD are taken into account for calibration.	
Other function	UPW standard resistivity input		Select one from the next. 182.3 kΩ · m (standard), 181.8 kΩ · m, 182.4 kΩ · m, 18.23 MΩ · cm (standard), 18.18 MΩ · cm, or 18.24 MΩ · cm	
	Clipping function		If the measured value exceeds the user setting value for clipping, the measured data will be held at the clipping value.	
Self-check	Sensor diagnosis error		Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range	
	Converter error		CPU error, ADC error, and memory error	
Operating temperature range			-20°C to 55°C (without freeze)	
Operating humidity range			Relative humidity: 5% to 90% (without condensation)	
Storage temperature			-25°C to 65°C	
Power supply	Power supply voltage range		100 V to 240 V AC ±10% 50/60 Hz	
	Power consumption		15 VA (max.)	
	Others		With time lag fuse (250 V, 1 A)	
			With power switch for maintenance use	
Compatible standards	CE marking (*Note 2, 3)		EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments	
	FCC Rules		Part15 CLASS A	
Structure	Installation		Outdoor installation type	
	Installation method		Mounted on 50 A pole or wall	
	Protection code		IP65	IEC60529, JIS C0920
	Case material		Aluminum alloy (coated with epoxy-denatured melamine resin)	
	Material of fittings		SUS304	
	Material of hood		SUS304 stainless steel (coated with epoxy-denatured melamine resin)	
	Material of window		Polycarbonate	
	Display element		Reflective monochrome LCD	
External dimensions			180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)	
Mass			Main body: Approx. 3.5 kg; cover and fittings: Approx. 1 kg	

Note 1: Without temperature compensation, 0.0-100.0 MΩ · cm (0-1000 kΩ · m) can be displayed.

Note 2: When the sensor cable, the transmission cable, or the contact input cable is extended by 30 m or more, the surge test under the EMC Directive for CE marking is not applied.

Note 3: The standard for effect on the reading by the electromagnetic field of the radiated radio frequency and by the conducted interference of CE marking EMC directive is within the measured Resistivity value ±0.5%.

Note : An arrester (spark over voltage: 400 V) is implemented for transmission output, contact input, and communication. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

HE-300R Specification

Product name			Resistivity meter	
Model			HE-300R	
Combined sensor			2-electrode method resistivity sensor (ERF-001 Series) of cell constant 0.01/cm	
Measuring range	Resistivity	MΩ · cm	0.000 to 2.000	0.00 to 20.00 (*Note 1)
		kΩ · m	0.00 to 20.00	0.0 to 200.0 (*Note 1)
	Temperature		0°C to 100°C (Display range: -10°C to 110°C)	
Display resolution	Resistivity		As shown in the measuring table.	
	Temperature		0.01°C	
Performance	Resistivity	Repeatability	Within ±0.1% of the full scale (response for equivalent input)	
		Linearity	Within ±0.5% of the full scale (response for equivalent input)	
	Temperature	Repeatability	±0.1°C (response for equivalent input)	
		Linearity	±0.5°C (response for equivalent input)	
Transmission output	Output type		4 mA to 20 mA DC: input/output isolated type	
	Load resistance		Maximum: 600 Ω Case of 24 V DC power supply (*Note 2)	
	Linearity		Within ±0.08 mA (output only)	
	Repeatability		Within ±0.02 mA (output only)	
	Output range		Resistivity: Free setting within a measuring range.	
	Occasional out for error		Hold or burnout to either 3.8 mA or 21 mA	
	Transmission hold		In the maintenance mode, transmission signal is held at the latest value or preset value. In the calibration mode, transmission signal can be alive or held.	
Contact input	Number of inputs		1	
	Contact type		No-voltage "a" contact for open collector	
	Conditions		ON resistance: 40 Ω max. Open voltage: 1.2 VDC Short-circuit current: 21 mA DC max.	
	Contact function		External input for transmission holding.	
Temperature compensation	Temperature element		Platinum resistor: 1 kΩ (0°C)	
	Temperature compensation		• Temperature characteristic of NaCl (reference temperature: 5°C to 95°C) • Arbitrary temperature coefficient input (reference temperature: 5°C to 95°C; temperature coefficient: ±3%/°C) • No temperature compensation One of the three ways of compensation is selectable. (In the de-ionized water area, the temperature compensation for pure water is automatically performed in both NaCl and arbitrary temperature coefficient compensation settings.)	
	Temperature compensation range		0°C to 100°C (However, the compensation calculation is extended lower than 0°C or higher than 100°C.)	
	Temperature calibration		1 point calibration comparing to reference thermometer	
Calibration	Resistivity		Based on parameter input of coefficient for the sensor cell constant.	
	Temperature		Comparison to the accurate thermometer Both deviation and coefficient of RTD are taken into account for calibration.	
Other function	UPW standard resistivity input		Select one from the next. 182.3 kΩ · m (standard), 181.8 kΩ · m, 182.4 kΩ · m, 18.23 MΩ · cm (standard), 18.18 MΩ · cm, or 18.24 MΩ · cm	
	Clipping function		If the measured value exceeds the user setting value for clipping, the measured data will be held at the clipping value.	
Self-check	Sensor diagnosis error		Temperature sensor short-circuit, temperature sensor disconnection, and out of the temperature measurement range	
	Meter error		CPU error, ADC error, and memory error	
Operating temperature range			-20°C to 60°C (without freeze)	
Operating humidity range			Relative humidity: 5% to 90% (without condensation)	
Storage temperature			-25°C to 65°C	

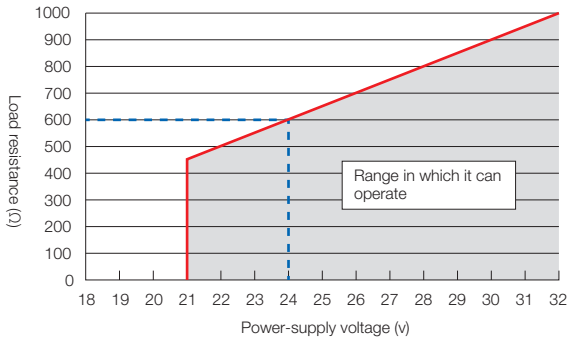
Power supply	Power supply voltage range	24 V DC (21 V to 32 V)	
	Power consumption	0.6 W (max.)	
Compatible standards	CE marking	EMC: EN61326-1 Class A, Intdustrial electromagnetic environment RoHS: EN IEC 63000 9. Monitoring and control instruments including industrial monitoring and control instruments	
	FCC Rules	Part15 CLASS A	
Structure	Installation	Outdoor installation type	
	Installation method	Mounted on 50 A pole or wall	
	Protection code	IP65	IEC60529, JIS C0920
	Case material	Aluminum alloy (coated with epoxy-denatured melamine resin)	
	Material of fittings	SUS304	
	Material of hood	SUS304 stainless steel (coated with epoxy-denatured melamine resin)	
	Material of window	Polycarbonate	
	Display element	Reflective monochrome LCD	
External dimensions		180 (W) x 155 (H) x 115 (D) mm (excluding the fittings)	
Mass		Main body: Approx. 2.8 kg; cover and fittings: Approx. 1 kg	

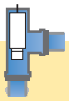
Note 1: Without temperature compensation, 0.0-100.0 MΩ · cm (0-1000 kΩ · m) can be displayed.

Note 2: The maximum load resistance that can be connected is decided depending on the power-supply voltage.

Note : An arrester (spark over voltage: 400 V) is implemented for power supply. However, use a most suitable surge absorption element on the connection lines in accordance with the ambient environment, the situation of equipment installed, and the externally connected equipment.

Relation between power-supply voltage and load resistance





Flow-through type

HE-480R Specification

Product name			Industrial resistance meter			
Model			HE-480R			
Measurement method			Electrode type (2-electrode method)			
Cell constant			0.01/cm			
Temperature sensor specifications			Platinum resistance 1000 Ω/0°C; temperature coefficient 3750 ppm/°C standard			
Measuring range	Measurement unit	kΩ · m	0 to 2.00	0 to 20.0	0 to 200.0	0 to 1000*
		MΩ · cm	0 to 0.200	0 to 2.00	0 to 20.00	0 to 100.0*
			*: Measurable without temperature compensation			
			Temperature: 0°C to 100°C (Select your desired decimal point from 0, 1, and 2 digits.)			
Repeatability Within			±0.5% of the full scale (in equivalent input)			
Linearity Within			±0.5% of the full scale (in equivalent input)			
Transmission output			4 mA to 20 mA DC: input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range			
Contact output			Outputs: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.			
Calibration function			Specific resistance: Based on the specified compensation coefficient for cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer			
Transmission output hold feature			• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the previous value hold is available in the maintenance Mode.)			
Self-diagnosis function			• Sensor diagnosis Short-circuit and disconnection of the temperature sensor • Out of the measurement range • A/D converter scale over • Converter error			
Temperature compensation			• Based on the temperature characteristics of extra deionized water (reference temperature: 25°C) • Based on the reference temperature and user-defined temperature coefficient (reference temperature: 5°C to 95°C) • No temperature compensation			
Temperature-compensated range			0°C to 100°C			
Extra deionized water specific resistance selection	Measurement unit	kΩ · m	182.3 (standard), 181.8, 182.4	Select from options shown on the left.		
		MΩ · cm	18.23 (standard), 18.18, 18.24			
Clipping function			When the measured value is above the upper limit of the measurement range derived from the specified specific resistance, the specified resistance is used as the measured value.			
Ambient temperature			-5°C to 45°C			
Relative humidity			20% to 85% (without dew condensation)			
Storage temperature			-25°C to 65°C			
Power supply			Rated voltage 100 V to 240 V AC, 50/60 Hz, 10 VA (max.)			

Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)
Conforming standards	CE Marking	EMC: EN61326-1 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)
Mass		Approx. 400 g
Compatible sensors		ERF, ERD-series specific resistance sensor, cell constant 1.0/m (0.01/cm)

HE-480R-DC24V Specification

Product name			Industrial resistance meter			
Model			HE-480R-DC24V			
Measurement method			Electrode type (2-electrode method)			
Cell constant			0.01/cm			
Temperature sensor specifications			Platinum resistance 1000 Ω/0°C			
Measuring range	Measurement unit	kΩ · m	0 to 2.00	0 to 20.0	0 to 200.0	0 to 1000*
		MΩ · cm	0 to 0.200	0 to 2.00	0 to 20.00	0 to 100.0*
			* Measurable without temperature compensation			
			Temperature: 0°C to 100°C (Select your desired decimal point from 0, 1, and 2 digits.)			
Repeatability Within			±0.5% of the full scale (in equivalent input)			
Linearity Within			±0.5% of the full scale (in equivalent input)			
Transmission output			4 mA to 20 mA DC: input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range			
Contact output			Outputs: 2 points Alarm contact output (R1 and R2) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from upper/lower limit operation (ON/OFF control), alarm, and maintenance.			
Calibration function			Specific resistance: Based on the specified compensation coefficient for cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer			
Transmission output hold feature			• Previous value hold • Optional value hold • Continuous Selectable from the above (However, only the previous value hold is available in the maintenance Mode.)			
Self-diagnosis function			• Sensor diagnosis Short-circuit and disconnection of the temperature sensor • Out of the measurement range • A/D converter scale over • Converter error			
Temperature compensation			• Based on the temperature characteristics of extra deionized water (reference temperature: 25°C) • Based on the reference temperature and user-defined temperature coefficient (reference temperature: 5°C to 95°C) • No temperature compensation			
Temperature-compensated range			0°C to 100°C			
Extra deionized water specific resistance selection	Measurement unit	kΩ · m	182.3 (standard), 181.8, 182.4	Select from options shown on the left.		
		MΩ · cm	18.23 (standard), 18.18, 18.24			
Clipping function			When the measured value is above the upper limit of the measurement range derived from the specified specific resistance, the specified resistance is used as the measured value.			
Ambient temperature			-5°C to 45°C			
Relative humidity			20% to 85% (without dew condensation)			
Storage temperature			-25°C to 65°C			
Power supply			Rated voltage 24 V DC, 5 W (max.)			

Structure		Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure
Protective structure		Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00
Conforming standards	CE Marking (*Note 1)	EMC: EN61326-1 Class A, Industrial electromagnetic environment RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments
	FCC Rule	FCC Part15
External dimensions		48 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)
Mass		Approx. 400 g
Compatible sensors		ERF, ERD-series specific resistance sensor, cell constant 1.0/m (0.01/cm)

Note 1: Influence at immunity (industrial environment)
Noise increase: ±0.2% of the full scale or less

HE-960RW Specification

Product name			Industrial 2-channel resistance meter		
Model			HE-960RW		
Measurement method			Electrode type (2-electrode method)		
Sensor input			2 channels (for concurrent measurement with sensors isolated each other)		
Cell constant			0.01/cm		
Temperature sensor specifications			Platinum resistance 1000 Ω/0°C		
Measuring range	Measurement unit	kΩ · m	0 to 20.0	0 to 200.0	0 to 1000*
		MΩ · cm	0 to 2.00	0 to 20.00	0 to 100.0*
			* Measurable without temperature compensation		
	Temperature		0°C to 100°C (The number of digits after the decimal point is selectable from one and two. The range of measurements is -20°C to 120°C.)		
	Desalination rate		0% to 100%		
Repeatability			Within ±0.1% of the full scale (in equivalent input)		
Linearity			Within ±0.5% of the full scale (in equivalent input)		
Transmission output			Number of outputs: 2 4 mA to 20 mA DC/0 mA to 20 mA DC, input/output isolated type Maximum load resistance: 900 Ω Transmission output range: Freely selectable within the measurement range (Negative terminals of each transmission output channel are connected inside and thus have the same electric potential.)		
Contact output			Number of outputs: 4 Alarm contact outputs (R1, R2, and R3) Contact type: relay contact, SPST (1a) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from the upper/lower limit action (ON/OFF control), delay, and hysteresis Output contents: selectable from the selected measurement, anomaly alarm, and maintenance. Alarm contact output (R4) Contact type: relay contact, SPDT (1c) Contact rating: 240 V AC, 3 A and 30 V DC, 3 A (resistance load) Contact function: selectable from the upper/lower limit action (ON/OFF control), delay, and hysteresis Output contents: selectable from the selected measurement, anomaly alarm, and maintenance. (However, R1 and R2, and R3 and R4 share the common contacts respectively.) Contact operation (operation between C and NO for R1 to R4) When selected measurement or maintenance is selected in output contents: Contact point becomes "CLOSE" at control operation and "OPEN" at normal state (including power shutdown) When anomaly alarm is selected in output contents: Contact point becomes "CLOSE" at normal state and "OPEN" at anomaly state (including power shutdown) (When between C and NC is used with R4, contact point becomes reverses state with that of between C and NO.)		
Communication output			RS-485 input/output		
Calibration function			Specific resistance: Based on the specified compensation coefficient for cell constant (parameter input) Temperature: Calibrated by comparing with the reference thermometer		

Transmission output hold feature			• Previous value hold • Optional value hold Selectable from the above (However, only the previous value hold is available in the maintenance mode.)	
Self-diagnosis function			• Sensor diagnosis Short-circuit and disconnection of the temperature sensor • Out of the measurement range • Converter error	
Temperature compensation			• Temperature compensation for extra-deionized water and impurities Select the temperature characteristics of impurities - NaCl temperature characteristics - Arbitrary temperature coefficient entry (temperature coefficient: 5%/°C) Reference temperature: 5°C to 95°C • No temperature compensation is performed.	
Temperature-compensated range			0°C to 100°C	
Extra deionized water specific resistance selection	Measurement unit	kΩ · m	182.3 (standard), 181.8, 182.4	Select from options shown on the left.
		MΩ · cm	18.23 (standard), 18.18, 18.24	
Clipping function			When the measured value is above the upper limit of the measurement range derived from the specified specific resistance, the specified resistance is used as the measured value.	
Ambient temperature			-5°C to 45°C	
Relative humidity			20% to 85% (without dew condensation)	
Storage temperature			-25°C to 65°C	
Power supply			Rated voltage 100 V to 240 V AC, 50/60 Hz, 15 VA (max.)	
Structure			Indoor-use panel installation type Panel case: ABS, Terminal: PBT Panel: IP65 dust and water proof structure	
Protective structure			Panel: IP65 (IEC60529, JIS C0920) Rear case: IP20, Terminal: IP00 Class II device (IEC61010-1) Pollution level 2 (IEC61010-1)	
Conforming standards	CE Marking (*Note 1)		EMC: EN61326-2-3 Class A, Industrial electromagnetic environment Safety: EN61010-1 RoHS: EN IEC63000 9. Monitoring and control instruments including industrial monitoring and control instruments	
	FCC Rule		FCC Part15	
External dimensions			96 (W) mm x 96 (H) mm x 115 (D) mm Case depth: approx. 105 mm (when panel-mounted)	
Mass			Approx. 550 g	
Compatible sensors			ERD/ERF-series specific resistance sensor, cell constant 0.01/cm	

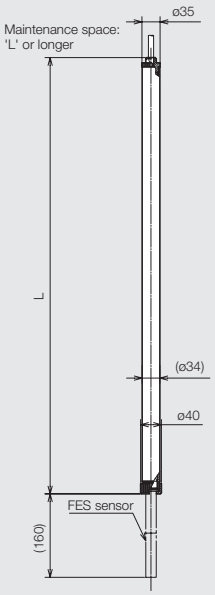
Note 1: Immunity (Industrial electromagnetic environment)
Allowable readout fluctuation ±0.5% full scale

Immersion-type Holders

Immersion type

■ EH-101/102

■ External dimensions (Unit: mm)



■ EH-101/102 Specifications

Product name		Immersion-type holder	
Model		EH-101	EH-102PF
Ambient temperature range		0 to 50°C	0 to 50°C
Conditions for measuring liquid	Temperature*1	0 to 50°C	0 to 50°C
	Pressure	Atmospheric pressure	
	Flow velocity	2 m/sec or less	
Material of liquid-contacting part		PP	PVDF*2
Weight (nominal length: 1 m)		Approx. 0.3 kg	Approx. 0.45 kg
Typical sensor used in combination		Electroconductivity sensor : FES-125F : FES-126F	

*1 The operating temperature range varies depending on the sensor used in combination.
Check the sensor's temperature specifications.
Note that measurement cannot be performed when the liquid to be measured is frozen or boiling.
*2 PVDF material, which has superior light resistance, is also available. Contact us for details.

[Code table] Supported sensors: FES-125F/126F

Model	Material	Holder length (L1)	Specifications
EH-101			Immersion-type holders for FES-125F/126F
	-		PP
		-0.5	0.5m
		-1.0	1.0m
		-1.5	1.5m
		-2.0	2.0m
		-2.5	2.5m
		-3.0	3.0m

Flow-through Type Holders

Flow-through type

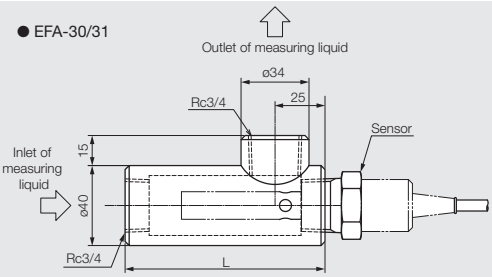
■ EFA-30/31
(Material of liquid-contacting part: PVC)

■ EFA-30P/31P
(Material of liquid-contacting part: PVDF)

■ EFA-30S/31S
(Material of the liquid-contacting part: SUS316)

■ External dimensions (Unit: mm)

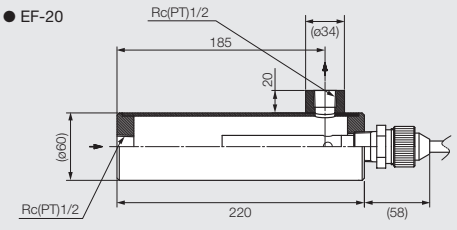
● EFA-30/31



■ EF-20/20P/20S
(Material of liquid-contacting part: PVC/PVDF/SUS316)

■ External dimensions (Unit: mm)

● EF-20



[Code table] Applicable sensors: ESH-X-X-X-ST series (short-cell type)

Model	Specifications
EFA-30	Holder length (L): 100, material: PVC, measuring liquid pressure range: 0 to 0.1 MPa, measuring liquid temperature range: 0 to 50°C
EFA-30P	Holder length (L): 100, material: PVDF, measuring liquid pressure range: 0 to 0.1 MPa, measuring liquid temperature range: 0 to 100°C
EFA-30S	Holder length (L): 100, material: SUS316, measuring liquid pressure range: 0 to 0.5 MPa, measuring liquid temperature range: 0 to 100°C

[Code table] Applicable sensors: ESH-X-X-X-LG series (long-cell type)

Model	Specifications
EFA-31	Holder length (L): 150, material: PVC, measuring liquid pressure range: 0 to 0.1 MPa, measuring liquid temperature range: 0 to 50°C
EFA-31P	Holder length (L): 150, material: PVDF, measuring liquid pressure range: 0 to 0.1 MPa, measuring liquid temperature range: 0 to 100°C
EFA-31S	Holder length (L): 150, material: SUS316, measuring liquid pressure range: 0 to 0.5 MPa, measuring liquid temperature range: 0 to 100°C

[Code table] Applicable sensors: FES-125F/126F

Model	Specifications
EF-20	Material: PVC, measuring liquid pressure range: 0 to 0.1 MPa, measuring liquid temperature range: 0 to 50°C
EF-20P	Material: PVDF, measuring liquid pressure range: 0 to 0.1 MPa, measuring liquid temperature range: 0 to 100°C
EF-20S	Material: SUS316, measuring liquid pressure range: 0 to 0.5 MPa, measuring liquid temperature range: 0 to 100°C

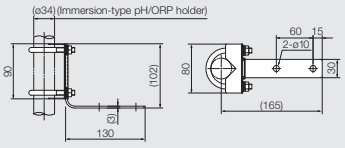
Immersion Holder Accessories * Applicable holders: EH-101 only

Immersion type

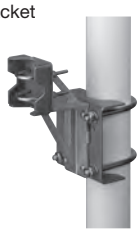
■ Mounting brackets
BA-2A (ABS)
BA-1S (SUS)

■ External dimensions (Unit: mm)

● BA-2A/BA-1S

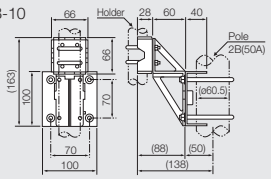


■ Mounting bracket
MB-10



■ External dimensions (Unit: mm)

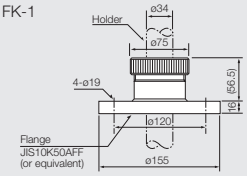
● MB-10



■ Loose flange
FK-1

■ External dimensions (Unit: mm)

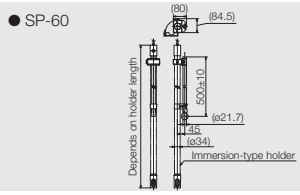
● FK-1



■ Support pipe
SP-60

■ External dimensions (Unit: mm)

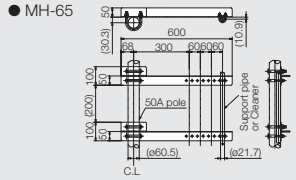
● SP-60



■ Mounting bracket
MH-65

■ External dimensions (Unit: mm)

● MH-65

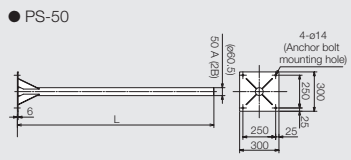


■ Pole stand
PS-50

Pole stand for on-site fixing and installation of outdoor-use type transmitters, holders, and cleaners.

■ External dimensions (Unit: mm)

● PS-50



[Mounting bracket / Code table]

Necessary for fixing immersion-type holders to the pole stand.

Model	Specifications	Item code
BA-2A	For immersion-type holders, ABS resin, for fixing a holder to the tank wall (or foundation), up to 1.5 m	3200704060
BA-1S	For immersion-type holders, SUS304, for fixing a holder to the tank wall (or foundation), up to 1.5 m	3100197370
MB-10	For immersion-type holders, for SUS304 or 50 A pole fixation	3014068945

[Loose flange / Code table]

Model	Material	Specifications	Item code
FK-1			
	-	PP, JIS 10K50A	3030047266
	-P	PVC, JIS 10K50A	3030047267
	-S	SUS316, JIS 10K50A	3030047268

[Support pipe / Code table]

Model	Nominal length	Specifications	Item code
SP-60		Material: SUS316	
	-1.0	Holder length: 1.0 m	3030047497
	-1.5	Holder length: 1.5 m	3030047164
	-2.0	Holder length: 2.0 m	3030047165
	-2.5	Holder length: 2.5 m	3030047166
	-3.0	Holder length: 3.0 m	3200313678

* For holder lengths of 2.0 m or longer, we recommend the above support pipe.
* When mounting, use the following MH-65 for cleaners/support pipes. Please separately prepare a pole stand for mounting.

[Support pipe mounting bracket / Code table]

The mounting bracket is necessary for fastening support pipes to the pole stand.

Model	Specifications	Item code
MH-65	For support pipe, SUS304	3030047918

[Other: Pole stand / Code table]

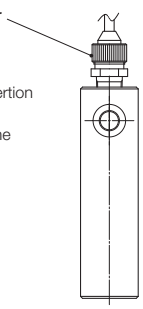
Model	Specifications	Item code
PS-50-1.5-SUS-300	Material: SUS304, 50 A, 1.5 m Pedestal: 300 x 300	3030047360
PS-50-1.7-SUS-300	Material: SUS304, 50 A, 1.7 m Pedestal: 300 x 300	3200312089

Flow-through Holder Accessories * Applicable sensors: FES-125F/126F

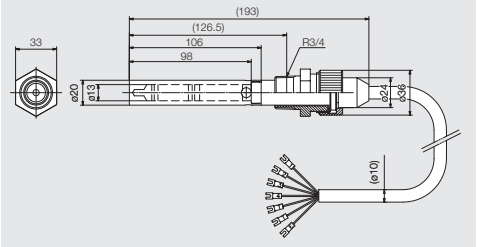
Flow-through type

■ Screw-in adapter
EA-20/EA-40

Used to screw the FES-125F/126F insertion sensor for high concentration into the flow-through holder EF-20/20P/20S.



■ External dimensions (Unit: mm)



COND

Relay Box / Relay Cables

Immersion type
Flow-through type

For immersion, drop-in, and flow-through types

■ Relay box
CT-50EC

If the sensor holder and the indicated transmitter body are farther apart than the sensor cable length, this is used as a cable repeater.

[Relay box / Code table]

Model	Specifications	Item code
CT-50EC	ABS resin	3200690924

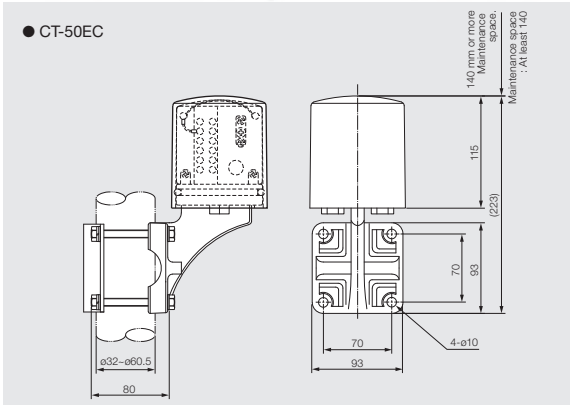
■ Relay cables
C-5C
C-7E

Used for connecting the transmitter and the relay box. The maximum possible extension distance is 50 m for the combined sensor cable and relay cable.

Model	Outer diameter
C-7E	ø10
C-5C	ø6.5

■ External dimensions (Unit: mm)

● CT-50EC



[Relay cable / Code table]

Supported transmitters: HE-200H/HE-480H/HE-960HI/HE-150HI

Model	Terminal	Termination	Supported transmitter	Cable length	Specifications
C-7E					For electroconductivity sensors
	-Y				Y terminal
	-O				Round terminal*1
		-T2			Termination for both ends*2
			-ES		HE-200H/HE-480H/HE-960HI/HE-150HI
				-10	Cable length: 10 m
				-20	Cable length: 20 m

*1 This is a made-to-order product.
*2 For cables without termination, please consult with our sales representative.

[Relay cable / Code table]

Supported transmitters: HE-200C/HE-300C/HE-300C-IS/HE-480C/HE-480C-DC24V/HE-960CW/HE-960CW-P

Model	Terminal	Termination	Supported transmitter	Cable length	Specifications
C-5C					For electroconductivity sensors
	-Y				Y terminal
	-O				Round terminal*1
		-T2			Termination for both ends*2
			-E		HE-200C/HE-300C/HE-300C-IS/HE-480C/HE-480C-DC24V/HE-960CW/HE-960CW-P
				-10	Cable length: 10 m
				-20	Cable length: 20 m

*1 This is a made-to-order product.
*2 For cables without termination, please consult with our sales representative.

Dedicated Cables for Connector Sensors

Flow-through type

Supported sensors: ESH series,
FS series,
ERF series

Model	Specifications	Item code
CK-Y10	Cable length: 10 m	3030046589
CK-Y20	Cable length: 20 m	3030046590
CK-Y30	Cable length: 30 m	3030046591

Supported sensors: FES series

Model	Specifications	Item code
SK-10	Cable length: 10 m	3200039637
SK-20	Cable length: 20 m	3200057436
SK-30	Cable length: 30 m	3200140588
SK-40	Cable length: 40 m	3200140589
SK-50	Cable length: 50 m	3200140537

* For cable lengths other than the above, please consult with our sales representative.

Accessories for Transmitters

Immersion type
Flow-through type

Select this set when using a water quality meter at a site where corrosive gases are generated.

[Fitting for air purge / Code table]

Model	Specifications	Item code
Fitting for air purge	Metal pipe fitting for ø6 (Included as part of the transmitter)	3200355128

When using an intrinsically safe explosion-proof transmitter, select this as a set.

[Accessories for intrinsically safe explosion-proof transmitters / Code table]

Model	Specifications	Item code
Z787 TIIS	Zener barrier (manufactured by Pepperl+Fuchs)	3200420320
KFD2-STC4-EX1 TIIS	Isolated barrier (manufactured by Pepperl+Fuchs)	3200420323
Attachment of Ex-tag on the sensor cable*	Attachment of Ex-tag on the sensor cable, with binding band (supplies)	3200521669

* An intrinsically safe explosion-proof transmitter comes standard with the main unit.

MEMO

IMS

The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System ISO45001.
We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.

Please read the operation manual before using this product to assure safe and proper handling of the product.

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