

For Chemical Concentration Control of Semiconductor Cleaning Processes

HF/HCl Concentration Monitor

HF-960H

Ideal for measuring high concentrations of hydrofluoric acid, hydrochloric acid, etc.



CE marking compliant

The HF-960H accurately measures concentrations of hydrofluoric and hydrochloric acid used in semiconductor manufacturing and other processes. Measurement is based on conversion to concentration from four-electrode conductivity measurements, so a wide range of measurements is possible, from low to high concentrations. The dedicated FES-510 series sensor is made from materials that are highly resistant to chemicals, making this unit ideal for the management of hydrofluoric and hydrochloric acid, even in high concentrations.

Features a four-electrode carbon sensor with outstanding resistance to chemicals



Indication Converter HF-960H



Sensor FES-510-3/4

Features

- **Wide range compatibility**

Automatic decimal point adjustment enables a wide range of measurement for HF and HCl concentrations, from 0.000 to 10.00%.

- **Automatic display range switching**

The display range automatically switches from high to low concentrations. This unit also allows the user to monitor changes while maintaining an effective conductivity resolution.

- **Enables four types of measurement: HF concentration, HCl concentration, conductivity, and temperature**

HF and HCl concentrations are measured while compensating for temperatures based on the relevant temperature characteristic data. This unit can also be used to measure the conductivity of other chemicals.

- **Chemical resistant four-electrode carbon sensor**

The sensor is a new FES-510 series four-electrode flow-type sensor made from glass carbon, which is highly resistant to chemicals.

- **4-channel transmission output**

This unit is equipped with four output channels, so separate channels can be allocated to HF concentration, HCl concentration, conductivity, and temperature. Choose from two types of current output: 4 to 20 mA DC, or 0 to 20 mA DC.

- **24 V DC power supply**

- **RoHS compliant**

 The HF-960H is also an environmentally-friendly product that uses lead-free solder for mounting chips on the PCB.

Specifications (Indication Converter)

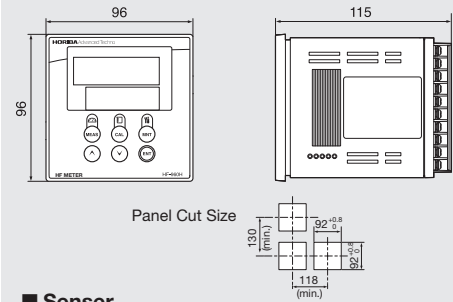
Model	HF-960H
Measurement method	4-electrode carbon flow-type conductivity measurement – concentration conversion
Sensor input	1-channel
Temperature sensor specifications	Platinum resistance 1000Ω/0°C
Measuring range	HF concentration 0 to 10% HCl concentration 0 to 10% Conductivity: 0 to 1000 mS/cm (without temperature compensation) Temperature: 0 to 100°C (The number of decimals displayed can be selected from 1 and 2.)
Repeatability	Within ±0.5% of the full scale (in equivalent input)
Linearity	Within ±0.5% of the full scale (in equivalent input)
Transmission output	No. of outputs: 4 4 to 20 mA DC or 0 to 20 mA DC: I/O insulation type Maximum load resistance: 900Ω Transmission output range: Custom setting possible within measurement range (Negative terminals of each transmission output channels are connected internally thus have the same electric potential.)
Contact output	No. of outputs: 5 Alarm contact outputs: R1, R2, R3 and R4 Contact type: Relay contact, SPST Contact rating: 240 V AC, 1A and 30 V DC, 1A (resistance load) Contact function: Selectable between upper/lower limit operation (ON/OFF control), and delay operation Contact action: • Closed during control action (during error setting) • Opened during normal status (including power supply off) Error alarm output (RF) Contact type: Relay contact, SPDT Contact rating: 240 V AC, 1A and 30 V DC, 1A (resistance load) Contact function: Selectable from error, trouble warning and maintenance Contact action: When connected between C and NO, the contact is closed when status is normal and opened when error is detected (including power supply off) (Contact status is reversed for connection between C and NC.) (R1, R2, R3 and R4, RF are for common use, respectively.)
Contact input	No. of inputs: 1 Contact status: Open collector no-voltage contact a Contact function: Transmission output hold
Communications output	RS-485 input/output
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 function	Selectable from the previous value hold and optional value hold (However, only the previous value hold is available during the maintenance mode.)
Self-diagnosis function	• Sensor diagnosis (Short-circuit and disconnection of the temperature sensor) • Converter error
Temperature compensation	• HF and HCl specific temperature compensation • Input of optional temperature compensation coefficient (Reference temperature: 25°C, Temperature coefficient: 0 to 3%/°C)
Temperature compensation range	HF: 0 to 80°C, HCl: 0 to 80°C, Conductivity: 0 to 100°C
Ambient environment	Temperature: -5 to 45°C, Relative humidity: 20 to 85% (without condensation)
Power supply	24 V DC ±10%, 10 W (max.)
Protective structure	Panel: IP65, Rear case: IP20, Terminal: IP00 (indoor-use panel installation type)
Mass	Approx. 550g
Conforming standards	CE marking, FCC Part 15
Compatible sensors	FES-510 series (flow-type carbon sensor)

Specifications 4-electrode carbon flow-type conductivity sensor

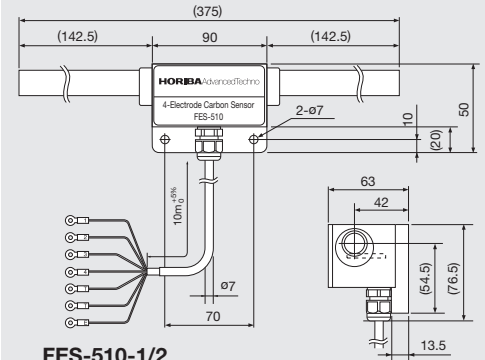
Model	FES-510	FES-510	FES-510	FES-510	FES-510	FES-510	FES-510
	-1/4	-3/8	-1/2	-3/4	-1	-6_4	-10_8
Liquid end material	Glass carbon (electrode), PFA (body), Kalrez® (seal)						
Piping size	1/4 inch	3/8 inch	1/2 inch	3/4 inch	1 inch	ø6/ø4 mm	ø10/ø8 mm
Sample flow rate	0 to 2 L/min	0 to 8 L/min	0 to 10 L/min	0 to 15 L/min	0 to 25 L/min	0 to 2 L/min	0 to 8 L/min
Sample pressure range	0 to 0.5 MP for 5 to 50°C, 0 to 0.1 MP for above 100°C For 50 to 100°C, pressure range is plotted between 0.5 MPa and 0.1 MP as shown on the line graph (refer to diagram on the right)						
Sample temperature	5 to 100°C (Aqueous solution which boils at 100°C)						
Cable length	10 m (standard)						

External dimensions Unit : mm (in)

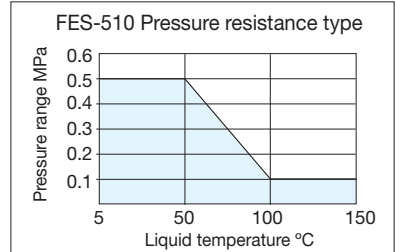
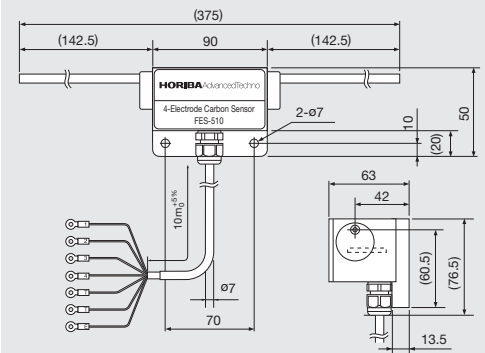
■ Indication Converter HF-960H



■ Sensor FES-510-3/4



FES-510-1/2



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

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HORIBA

HORIBA, Ltd.
Group Head Office
2 Miyahogashi-cho, Kisshoin, Minami-ku, Kyoto, 601-8510, Japan
Phone: 81 (75) 313-8121 Fax: 81 (75) 321-5725
http://www.horiba.com



Worldwide locations of HORIBA