

For Semiconductor Cleaning Processes

## Carbon Sensor Conductivity Meter High-concentration type

# HE-960HC



CE marking compliant

**Ideal for management of chemicals and liquid waste in semiconductor and FPD manufacturing processes**

The HE-960HC measures conductivity, which forms the basis for parameters in chemical and waste water management. Its dual calculation circuits and software, combined with four-electrode carbon sensors, enable measurements ranging from 0 to 1,000 mS/cm without switching.

Because it features two types of concentration conversion functions, it can be used as a process concentration meter, and also to monitor changes in the concentration of specified chemicals.

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



Indication Converter HE-960HC



Sensor FES-510-3/4

### Features

#### ● Wide range compatibility

Enables measurements up to 1000 mS/cm (conductivity measurement range before temperature compensation)

#### ● 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.

#### ● Accommodates various types of temperature compensation

Because standard temperature and temperature compensation factors can be set freely, temperature compensation can be applied in keeping with the liquid being measured.

#### ● Concentration conversion function

Two types of concentration conversion are possible, simply by inputting the temperature characteristics and the relationship between the chemical concentration and conductivity.

#### ● Communication functions (RS-485) offered as a standard feature

The main unit can be controlled remotely, for example to change settings or check measurement values.

#### ● 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. This allows measurement of conductivity in a wide range of chemicals used in semiconductor washing and other processes.

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

## Specifications (Indication Converter)

Model	HE-960HC		
Measurement method	4-electrode method		
Sensor input	1-channel		
Temperature sensor specifications	Platinum resistance 1000Ω/0°C		
Measuring range	Cell constant	1/cm (0.1/cm or 10/cm settings also available)	
	Conductivity	0 to 1000 mS/cm (Measurement range without temperature conversion)	
	Temperature	-20 to 150°C	
Concentration conversion	Custom1: 0 to 100%, Custom2: 0 to 100% (user-customizable conversion formula)		
Repeatability	0 to 20.00 mS/cm	Within ±0.5% of the full scale	(equivalent input)
	20.0 to 200.0 mS/cm		
	200 to 1000 mS/cm		
Linearity	0.0 to 100.0°C	Within ±0.2°C	(equivalent input)
	0 to 20.00 mS/cm		
	20.0 to 200.0 mS/cm		
Transmission output	200 to 1000 mS/cm	Within ±1.0% of the full scale	(equivalent input)
	0.0 to 100.0°C		
	0.0 to 100.0°C		
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 from 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) (R1 and R2, and R3 are for common use, respectively) 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.) (R4 and RF are for common use)		
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		
Conductivity temperature compensation	• Optional temperature compensation coefficient (reference temperature: 25°C; temperature coefficient: 0 to 3%/°C)		
Temperature compensation range	0 to 100°C (For below 0°C and above 100°C, calculate accordingly)		
Ambient environment	Temperature: -5 to 45°C, Relative humidity: 20 to 85% (without condensation)		
Power supply	100 to 240 V AC±10%, 50/60Hz, 20 VA (max)		
Protective structure	Panel: IP65, Rear case: IP00, Terminal: IP00 (Indoor-use panel installation type)		
Mass	Approx. 550g		
Conforming standards	CE marking, FCC Part 15		
Compatible sensors	FES-510 series (4-electrode carbon flow-type conductivity sensor)		

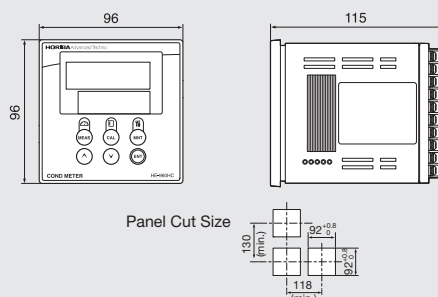
## Specifications 4-electrode carbon flow-type conductivity sensor

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 MPa 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)						

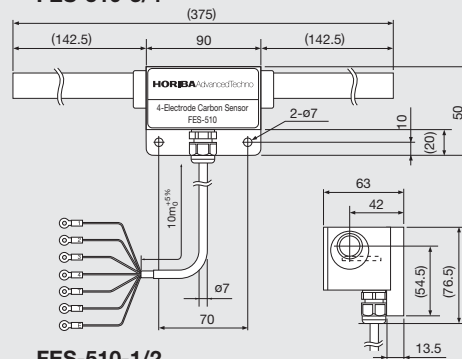
Note: Specification details will differ depending on the converter and sensor combination. The details in this brochure is specific for the combination with the flow-type 4-electrode carbon conductivity sensor.

## External dimensions Unit : mm (in)

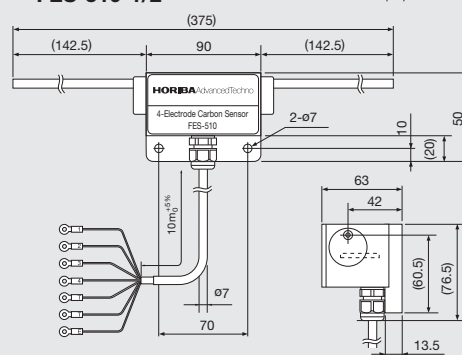
### ■ Converter HE-960HC



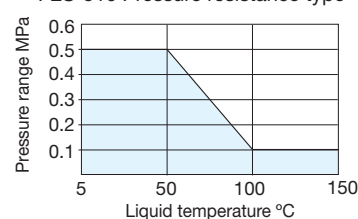
### ■ Sensor FES-510-3/4



### FES-510-1/2



### FES-510 Pressure resistance type



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

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