HORIBA
Semiconductor

For Semiconductor Cleaning Processes

Carbon Sensor Conductivity Meter Low-concentration type

HE-960LC

CE marking compliant

Perfect for chemical solution measurement and recycle of pure water in semiconductor and FPD manufacturing processes

Along with the evolution of devices, the types of chemical solutions used in the wet process of semiconductor and FPD manufacturing are increasing.
The HE-960LC uses chemical-resistant carbon electrodes and is thus perfect for measuring the conductivity of chemicals, for the control of concentration and dilution during various processes, and for monitoring the recycling of ultra-pure water, etc.

Amplifier HE-960LC

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

Sensor FS-07F

- **Chemical resistant two-electrode carbon sensor**
  The sensor is a new FS-07F series two-electrode flow-type sensor made from glassy carbon, witch is highly resistant to chemicals. This allows measurement of conductivity of a wide range of chemicals used in semiconductor cleaning and other processes.

- **Free form metal contamination**
  The HE-960LC eliminates the worry of metal contamination that exists with conventional metal electrodes. The carbon surface of its sensor is specially processed so that particle elution is extremely minuscule.

- **Wide range compatibility**
  Enables measurements up to 10000µS/cm (conductivity measurement range before temperature compensation)

- **Communication functions (RS-485) offered as a standard feature**
  The main unit can be controlled remotely, for example to chage settings or check measurement values.

- **Concentration conversion function**
  Concentration conversion of two individual chemicals is possible, simply by inputting the temperature characteristics and the relationship between the chemical concentration and conductivity. Especially it is suitable for the chemical dilution monitoring for lower concentration.

- **Accommodates various types of temperature compensation**
  Because standard temperature and temperature compensation coefficient can be set freely, unique temperature compensation can be applied for the specific liquid being measured.

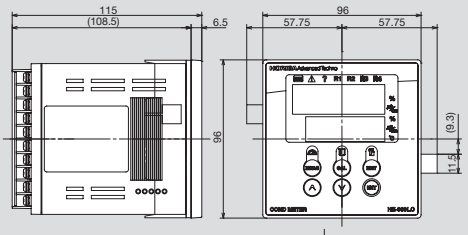
The HE-960LC is also an environmentally-friendly product that uses lead-free solder for mounting chips on the PCB.

Specifications (Indication Converter)

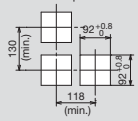
Model	HE-960LC		
Measurement method	Electrode Type (2-electrode method)		
Sensor input	1-channel		
Temperature sensor specifications	Platinum resistance 1000Ω/0°C		
Cell constant	0.1/cm, 1/cm		
Measuring range	Conductivity	0 to 1000μS/cm (Cell constant: 0.1/cm)	
		0 to 10000μS/cm (Cell constant: 1/cm)	
		*Measuring range of raw conductivity	
	Temperature	0 to 100°C	
Concentration conversion	Option 1, 2	0 to 10.000% (Conversion formula is defined by user)	
Repeatability	Cell constant	0.1/cm	1.0/cm
	0 to 1000μS/cm	±0.5%FS	–
	0 to 10000μS/cm	–	±0.5%FS
	0.0 to 100°C	±0.5°C	
	Condition	Using equivalent input	
Linearity	Cell constant	0.1/cm	1.0/cm
	0 to 1000μS/cm	±0.5%FS	–
	0 to 10000μS/cm	–	±0.5%FS
	0.0 to 100°C	±0.5°C	
	Condition	Using equivalent input	
Transmission output	Number of output: 4 4 to 20 mA DC / 0 to 20 mA DC: input/output isolated type Maximum load resistance: 900Ω Transmission output range: Free setting within the measuring 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: 240VAC, 1A or 30VDC, 1A (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: 240VAC, 1A or 30VDC, 1A (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: 1 Contact type: open collector, No-voltage contact Function: Hold command.		
Communication output	RS-485 communication		
Calibration function	Conductivity: Cell constant input in the parameter input menu. Temperture: 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	・Arbitrary temperature coefficient entry (reference temperature: 25°C, temperature: 0 to 3%/°C) ・Arbitrary temperature compensation formula entry (reference temperature: 25°C, formula is defined by user) ・No temperature compensation is performed.		
Temperature compensation rage	0 to 100°C (For below 0°C and abobe 100°C, calculate accordingly)		
Ambient environment	Temperature: -5～45°C, Relative humidity: 20 to 85% (without condensation)		
Power supply	Reted voltage 24VDC, 10W (max.)		
Protective structure	Panel: IP65, Rear case: IP20, Terminal: IP00		
Mass	Approx.550g		
Conforming standards	CE marking, FCC Part15		
Compatible sensors	Flow-through type: FS-07F series conductivity sensor Insertion type: ESH-01-L-GC5, ESH-1-L-GC9 conductivity sensor		

External dimensions Unit : mm (in)

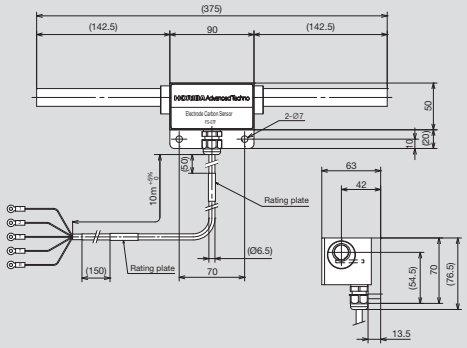
■ Converter HE-960LC



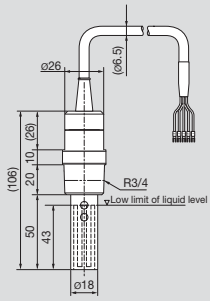
Panel Cut Size



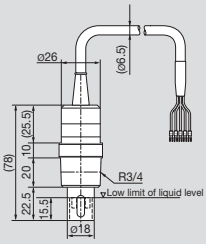
■ Senser FS-07F-3/4



ESH-01-L-GC5



ESH-1-L-GC9



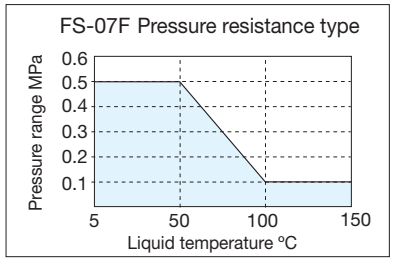
Specifications

2-electrode carbon flow-type conductivity sensor

Model	FS-07F-1/4	FS-07F-3/4	FS-07F-1
Liquid end material	Glass carbon (electrode), PFA (body), Kalrez (seal)		
Piping size	1/4inch	3/4inch	1inch
Sample flow rate	0 to 2L/min	0 to 15L/min	0 to 25L/min
Sample pressure	0-0.5 MPa 5-50 °C 0-0.1 MPa 100 to 150 °C under the line between (50, 0.5MPa) and (100, 0.1MPa) 50 to 100 °C		
Sample temperature	5-100 °C; Aqueous solution boiling point is around 100 °C. Maximum temperature 150 °C; Vapor pressure is under atmospheric pressure.		
Cable length	10m (standard)		

2-electrode carbon insertion type conductivity sensor

Model	ESH-01-L-GC5	ESH-1-L-GC9
Liquid end material	Glass carbon(electrode), PFA(body), Kalrez(seal)	
Installation	Threaded diameter: R(PT)3/4	
Combined holder	Flow type EFA-30 series	
Sample pressure range	0 to 0.5MPa	
Sample temperature	0 to 80°C	
Cable length	10m (standard)	



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

HORIBA Advanced Techno, Co., Ltd.
http://www.horiba-adt.jp/index_e.htm

●HORIBA Advanced Techno, Co., Ltd.
Head Office
Phone: 81 (75) 321-7184
Tokyo Sales Office
Phone: 81 (3) 6206-4721

●HORIBA Korea Ltd.
Phone: 82 (2) 753-7911

●HORIBA (China) Trading Co., Ltd.
Shanghai Office
Phone: 86 (21) 6289-6060
Beijing Office
Phone: 86 (10) 8567-9966

●HORIBA Taiwan, Inc.
Phone: 886 (3) 656-1160

●HORIBA Instruments (Singapore) Pte Ltd.
Phone: 65 (6) 745-8300

●HORIBA Instruments, Incorporated
Santa Clara Office
Phone: 1 (408) 730-4772
Austine Office
Phone: 1 (512) 836-9560

●HORIBA UK Limited
Phone: 44 (1604) 542-500

●HORIBA EUROPE GmbH
Head Office
Phone: 49 (6172) 1396-0

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