

For Semiconductor Manufacturing Process

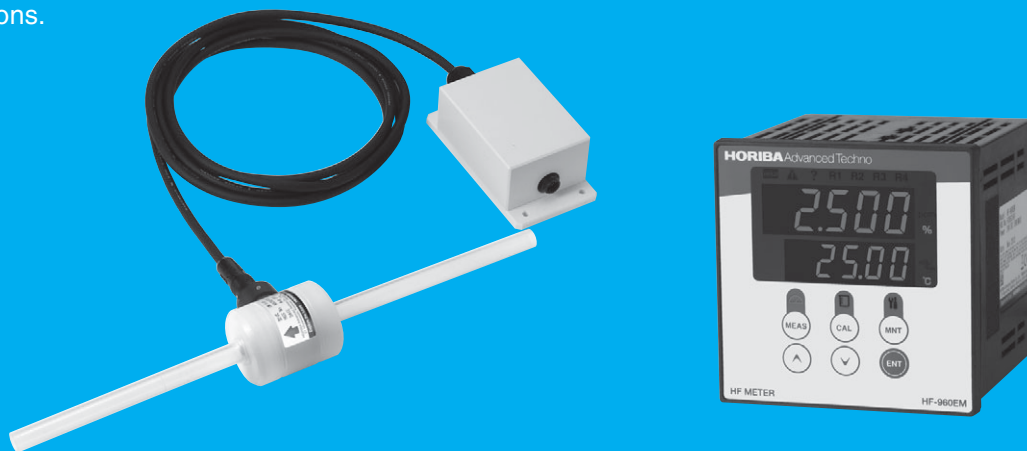
## HF Concentration Monitor HF-960EM / CM-520

Uses a cleanliness sensor suitable for the nanofabrication of semiconductor processes.  
Covers 0 to 50% measurement ranges.



CE marking compliant

As semiconductor processes involve increasingly nanofabrication, a greater level of cleanliness of wetted materials is required. The HF-960EM is equipped with a sensor for which the wetted part is only made from PFA, so the model completely complies with the cleanliness requirement of semiconductor processes. The sensor size has been reduced as much as possible, making it possible to install the model in a small space for single wafer processing in semiconductor wet processes. The stability and repeatability have been improved compared to previous models. The HF-960EM can provide wide measurement ranges of up to HF50% and it also achieves the rather wide range of 0 to 2,000 mS/cm of conductivity. These traits make this model most appropriate for measuring concentrations in various applications, required for introduction into the development stage of semiconductor processes as well as electric conduction management of special chemical solutions.



### ●Wide range of up to 50% HF concentration

The automatic range-setting function provides the most appropriate measurement performance at each target concentration from low to high concentration.

### ●Contamination free and chemical resistant sensor

Uses sensors for which the wetted parts are only made of PFA. The chemical resistant sensors can be used to measure various chemical solutions used in semiconductor processes.

### ●Compact size and lightweight sensors

The size has been reduced to two thirds (2/3) of the previous model and the weight has also been significantly reduced, allowing the HF-960EM to be placed more freely, for example, in front of the single wafer injection nozzle.

### ●High stability and repeatability

The HF-960EM has a built-in sensor for measuring temperature, so it can measure HF samples up to 80°C, achieving a reproducibility accuracy of FS ± 0.5%.

## Specifications Converter

Product name	Hydrofluoric acid meter		
Model	HF-960EM		
Combined sensor	CM-500 Series		
Combined amp	CM-AP02		
Measurement range	HF: 0 to 50%, HCl: 0 to 10%, Conductivity: 0 to 2000 mS/cm (raw conductivity), Temperature: 0 to 100°C		
Display resolution	HF: 0 to 5000 ppm, 0.500 to 5.000%, 5.00 to 50.00% HCl: 0 to 5000ppm, 0.500 to 5.000%, 5.00 to 10.00% Conductivity: 0.00 to 20.00 mS/cm, 20.0 to 200.0 mS/cm, 200 to 2000 mS/cm Temperature: -10 to 110°C (Selectable from one or two decimal place)		
Transmission output	Number of output	4 (Negative terminals of each transmission output channel are connected inside and thus have the same electrical potential.)	
	Output setting	4 to 20 mA DC or 0 to 20 mA DC: input to output isolated type	
	Output setting:	Selectable from HF conc. or HCl conc. or Conductivity or temperature	
Contact output	Number of output	5	
	ALARM contact R1 to R4	Self diagnosis contact RF	
	Contact type: Relay contact, SPST (1a) Contact function: Selectable from Upper/Lower limit alarm (ON/OFF control) at each measuring objects (concentration, temperature) Contact action: Closed when status is in the event. Opened when status is normal or power is down.	Contact type: Relay contact, SPDT (1c) Contact function: Fail	
Contact input	Number of input	1	
	Contact input (IN), Contact type: no-voltage input contact		
Communication	RS-485 communication (2 wire, input to output isolation)		
Calibration function	Zero span calibration		
Self-diagnosis function	Calibration error, temperature sensor diagnosis, communication error with converter		
Power supply	24V DC ±10% 15W		
Regulatory marks	CE Marking	EMC Directive (2004/108/EC), EN61326-1: 2006	
	FCC rule	FCC Part15	
Mass	Approx. 550 g		

## Amplifier Unit

Model	CM-AP02	
Measurement range	HF: 0 to 2/0 to 5/0 to 20/0 to 50% HCl: 0 to 5/0 to 10% Conductivity: 0 to 20/0 to 50/0 to 200/0 to 500/0 to 2000mS/cm	
Performance	Linearity	±0.5% of FS
	Repeatability	±0.5% of FS
	Response (90%)	3 sec at T
Temperature compensation	Target	HF, HCl, conductivity (Based on the temperature characteristics of NaCl, arbitrary temperature coefficient entry, no restitution)
	Compensation range	HF concentration: 0 to 80°C, HCl concentration: 0 to 80°C, Conductivity: 0 to 100°C
Connector	Push pull connector (PPS)	
Installation environment	Inside installation type (IP57)	
Structure	Panel case cover: PVC	
Ambient temperature/humidity	5 to 45°C/ Relative humidity: 5 to 90% (without dew condensation)	
Mass	Approx. 430 g	

## Sensor

Model	CM-520-1-AP02	CM-520-3/4-AP02	CM-520-3/8-AP02	CM-520-1/2-AP02	CM-520-1/4-AP02
Measurement principle	Electromagnetic induction				
Tube diameter	1 inch	3/4 inch	3/8 inch	1/2 inch	1/4 inch
Flow rate *1	0 to 25 L/min (13 L/min)	0 to 15 L/min (8 to 15 L/min)	0 to 8 L/min (4 to 8 L/min)	0 to 10 L/min (5 to 10 L/min)	0 to 2 L/min (1 to 2 L/min)
Sample pressure	0 to 0.3 MPa (5 to 50°C), 0 to 0.1 MPa (until 100°C), within the line (50°C, 0.3 MPa) and (100°C, 0.1MPa) for 50°C to 100				
Sample temperature	5 to 100°C: 0 to 0.3MPa, under 100°C: 0 to 0.1MPa For aqueous solution boiling at 100°C (Avoid steam pressure over 100°C for aqueous solution.) Heat resistant temperature 150°C within 0.1MPa.				
Cable length	2.5m; attached to the CM-AP02 unit				
Chemical contact material	PFA				
Ambient temperature/humidity	5 to 45°C/ Relative humidity: 5 to 90% (without dew condensation)				
Mass	Approx. 360 g		Approx. 220 g		

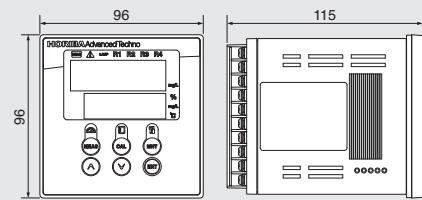
\*1 Measurement can be made even when there is no flow. However, if bubbles are created, this can affect the measurement value. A minimum flow is specified for the purpose of removing bubbles from the measurement cell. In some cases, even when the flow conditions specified above are met, it might be necessary to take countermeasures such as increasing the flow rate to remove bubbles. ( ): horizon setting.

## Cable

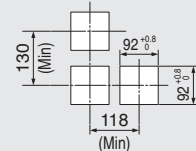
Product name	Cable			
Model	CK-05PS (Standard)	CK-03PS (Option)	CK-10PS (Option)	CK-20PS (Option)
Cable length	5 m	3 m	10 m	20 m
Cable length: 20 m max.				

## External dimension (Unit: mm)

### Converter HF-960EM

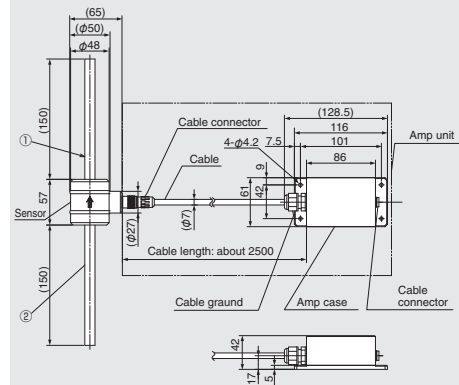


### Panel cut size



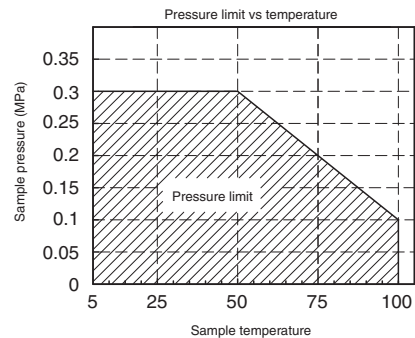
### Sensor

#### CM-520-1/2-AP02, CM-520-1/4-AP02, CM-520-3/8-AP02



	CM-520-1/2-AP02	CM-520-1/4-AP02	CM-520-3/8-AP02
① Sample outlet	1/2 inch	1/4 inch	3/8 inch
② Sample inlet	(φ9.5×φ12.7)	(φ4.35×φ6.35)	(φ6.33×φ9.35)

● Please contact to HORIBA as to CM-520-3/4 AP02, CM-520-1-AP02.



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

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