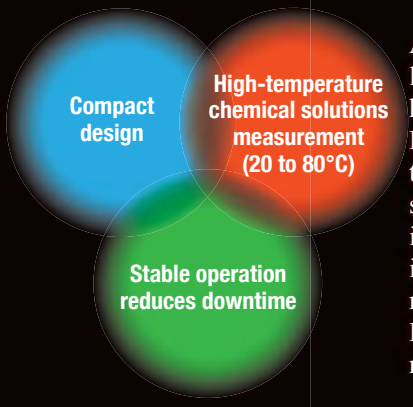
HORIBA
Semiconductor

Fiber Optic Type Chemical Solution Concentration Monitor

CS-600F

Enables Improved Cleaning Process Efficiency with
"High Temperature Chemical Measurement," "Stable Operation," and **"Compact Body Size"**
to Meet Leading-edge Process Requirements

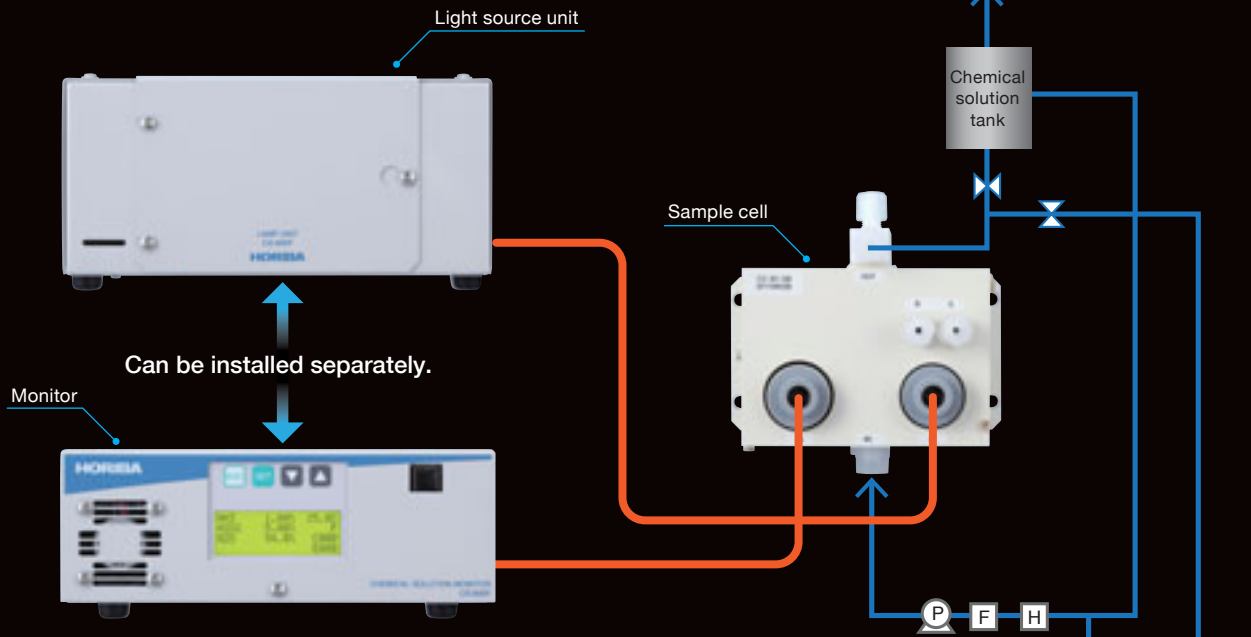
Compact Design High-temperature Chemical Solutions Measurement, and CS-600F Has All the Functions Necessary for Next-generation Processes.



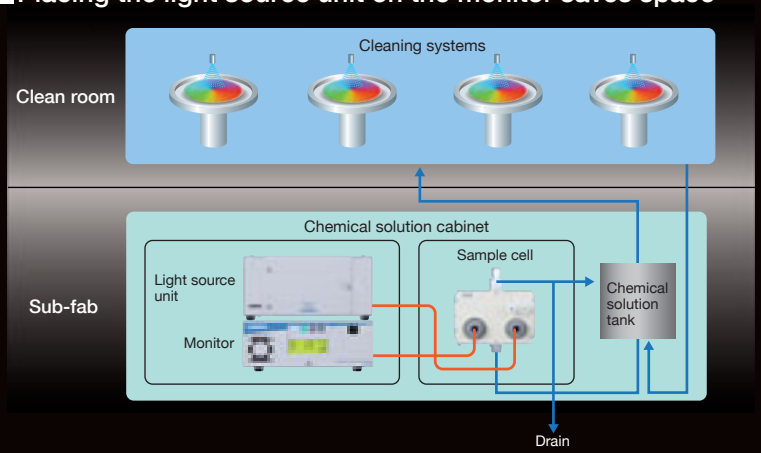
As semiconductor manufacturing increasingly utilizes nanofabrication and larger-diameter wafers, chemical solution concentration monitors also require higher performance for leading-edge semiconductor wet processes. HORIBA's fiber optic type chemical solution concentration monitor, the CS-600F, achieves a higher level of functionality best suited for manufacturing, such as the ability to perform in-line measurement of high temperature chemical solutions in various applications, stable operation for reduced downtime, and compact size for improved space productivity in order to meet the precise chemical solution concentration management required in leading-edge semiconductor wet processes. HORIBA contributes to increase yield and optimizing the processes of next-generation wet processes through chemical solution concentration management.

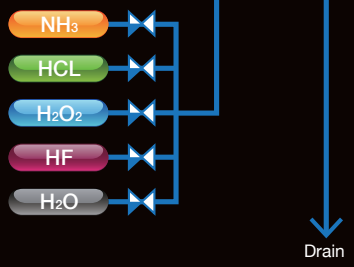
Reduced Sizes for More Flexibile Layout

The CS-600F monitor is compact in size; height has been reduced by 36%, volume by 40%, and the space required by the cell cables by 46% compared to previous models (CS-100F1 Series). The light source unit and monitor main body can be installed remotely and in separate locations, which allows installation flexibility based on the locations of the chemical solution unit and cleaning equipment.



■Placing the light source unit on the monitor saves space





High-stability, In-line Measurement of High Temperature Chemical Solutions (20 to 80°C)

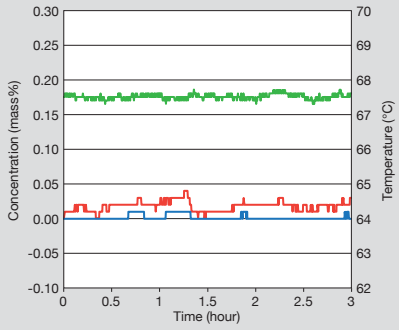
The all-new optical system and improved processing algorithms enable in-line measurement of high temperature chemical solutions, a critical step for leading-edge wet processes. This eliminates the need to cool-down the chemical sample., HORIBA's CS-600F provides a high-stability, enables more efficient and precise chemical solution management.

CS-600F-1P25P5 NH_3: 0.00-1.20mass%, H_2O_2: 0.00-5.50mass%, H_2O: 93.3-100.0mass%

NH_3 H_2O_2 Temperature DIW measured

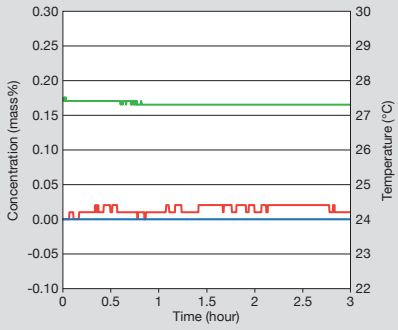
* Examples from internal data

■ CS-600F-1P25P5
High-temperature measurement



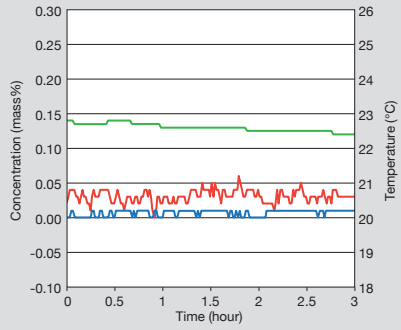
	NH_3 (mass%)	H_2O_2 (mass%)	H_2O (mass%)	Temperature (°C)
Average	0.002	0.018	99.93	67.51
Min	0.00	0.00	99.9	67.3
Max	0.01	0.04	100.0	67.7
Standard Deviation	0.004	0.007	0.05	0.07
Max error from Average	0.008	0.022	0.07	0.21

■ CS-600F-1P25P5
Normal temperature measurement



	NH_3 (mass%)	H_2O_2 (mass%)	H_2O (mass%)	Temperature (°C)
Average	0.000	0.014	100.00	27.32
Min	0.00	0.00	100.0	27.3
Max	0.00	0.02	100.0	27.6
Standard Deviation	0.000	0.006	0.00	0.04
Max error from Average	0.000	0.014	0.00	0.18

■ CS-151F1-1P25P5
Normal temperature measurement
[Previous model]



	NH_3 (mass%)	H_2O_2 (mass%)	H_2O (mass%)	Temperature (°C)
Average	0.007	0.031	100.00	22.60
Min	0.00	0.00	100.0	22.4
Max	0.01	0.06	100.0	22.8
Standard Deviation	0.005	0.009	0.00	0.11
Max error from Average	0.007	0.031	0.00	0.20

Significantly Reduced Background Correction Frequency

The regular correction frequency is significantly reduced compared to the previous model (CS-100F1 Series), which in turn significantly reduces unit downtime and greatly contributes to improved throughput.

A Single Monitor is Capable of Measuring Up to Six Types of Chemical Solutions (solution types or ranges)

A single monitor can measure up to six types of chemical solutions (solution types or ranges). Solution types and ranges can be freely specified, enabling the CS-600F to meet a wide variety of monitoring requirements.

Capable of Outputting Measured Values of Up to Six Components (Serial Output)

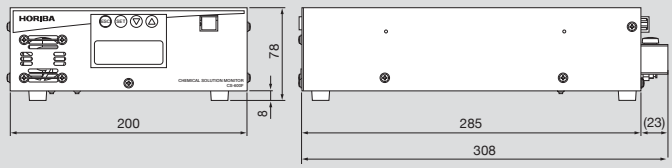
The previous model (CS-100F1 Series) was able to output four components (serial output). This new model can output up to six components through the serial output. Analog output of new model is four components versus two on the previous model.

■Specifications

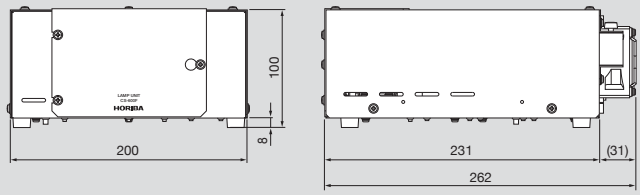
Model	CS-600F
Measurement principle	Absorption spectroscopic method
Calculation principle	Temperature compensation type multivariate analysis
Measurement target	NH_3/H_2O_2/H_2O (reperesentative specification) * Please contact HORIBA regarding other chemicals.
Measurement range	NH_3: 0.00 to 1.20 mass%, H_2O_2: 0.00 to 5.50 mass%, H_2O: 93.3 to 100.0 mass%
Repeatability	NH_3: ±0.05 mass%, H_2O_2: ±0.10 mass%, H_2O: ±1.0 mass% Chemical temperature: Within ±1°C/1 hour
Sample solution temperature	20 to 80°C
Measurement cycle	Approx. 3 seconds
LCD display	(1) Measured value (%) (2) Concentration alarm (HH/H/L/LL) (3) Error code (EXXX) (4) Chemical temperature (°C) (5) Serial/parallel communication status (P/S) (6) The times of background correction failure (CXXX)
Key input	(1) Concentration alarm setting (HH/H/L/LL) (2) Concentration value shift (3) Background correction (4) Hot water correction (5) Temperature dependent concentration shift
Parallel input	Input voltage of 12 V to 30 V DC by insulating with photo coupler (1) Parallel concentration alarm output (On/Off) (2) Switching chemical solution for measurement (including background correction) (3) Hot water correction
Parallel output	Transistor output (NPN open collector) by insulating with photo coupler Maximum current when powered ON: 5 mA DC (no internal protective resistance) Maximum voltage when powered OFF: 30 V DC 1) Concentration alarm (ON at HH/H/L/LL alarm) 2) Monitor error (OFF at error) 3) Measuring (ON at measurement) 4) Chemical solution type for measurement 5) Echo to hot water correction input 6) Warning (ON at occurred) 7) Background correction status 8) Hot water correction status
Serial input	RS-232C 1) Request for readout of measurement data 2) Select chemical solution type to be measured 3) Hot water correction
Serial output	RS-232C 1) Measured data No. 2) Chemical solution type 3) Concentration value 4) Error code 5) Chemical temperature
Analog output	4 mA to 20 mA In case of monitor error occurs, measurement is stopped or invalid chemical range is selected, the signal output is fixed at 1.5 mA. The load resistor must be 500 Ω maximum.
Chemical solution temperature input	Terminal block inlet (terminal screw M3) Platinum resistance temperature sensor: Pt100 (Three-conductor type, Class A) *Temperature sensor is not included.
Air (for operation and purge)	Connection port: 4 mm O.D. quick joint, Pressure: 0.2 MPa ±0.02 Mpa
Power source	100 V to 230 V AC (single phase), 50/60 Hz
Power consumption	Approx. 85 VA (transient electric current at the time of the start is excluded)
Weight	(Monitor) Approx. 3.6 kg (Lamp unit) Approx. 2.8 kg (Sample cell) Approx. 1.2 kg
Ambient temperature	(Monitor, Lamp unit) 20°C to 30°C (Sample cell, Optical fiber) 20°C to 35°C (Sudden temperature change should be avoided, within ±1°C/1 hour)
Ambient humidity	(Monitor, Lamp unit, Sample cell) 40% to 70% (Should be no dew condensation)
Slanting angle at installation	(Monitor, Lamp unit) within ±1°
Optical fiber	Length: 5 m, minimum bend radius: R 150 mm

■External dimensions (unit: mm)

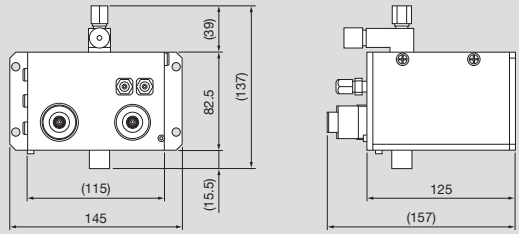
■Monitor



■Lamp unit



■Sample cell



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

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