

IR-300 Series

In-line vapor concentration monitor for bubbling supply line

Liquid and solid materials are used in MOCVD (Metal Organic Chemical Vapor Deposition) equipment, which is widely employed in compound semiconductor manufacturing processes, and are generally supplied to the chamber as vaporized gas by bubbling method. Real-time gas concentration monitoring is important to realize a stable deposition process. The system can also monitor the concentration of IPA vapor in the drying process and B₂H₆ gas, which decomposes easily.

In addition to monitoring vapor concentration, the system can be applied to concentration control systems including feedback control.

Contributed to stable supply of precursor

- Real-time Monitoring
- Multi-calibration Curve Function (Optional)
- Multi-display Function
- Communications Function
- Simple, Compact Design

Non-dispersive Infrared Absorptiometry (NDIR)



The infrared absorptiometry method employed by the IR-300 Series uses the principle of the absorption by gas molecules of the infrared light emitted from an infrared light source. The sample output from a sample that has absorbed the gas being measured is compared to a reference output with no absorbance, and the result is converted into a gas concentration. The use of this double beam method enables long-term, stable measurement results to be obtained.

STEC Fluid Control

Technology

HORIBA

Applications

- Continuous concentration monitoring of precursor
- Check precursor concentration while adjusting supply conditions
- Monitor residual quantities of liquid and solid precursors for better utilization



Gas cell optical path length	IR-312M	IR-314M	IR-315M	IR-322M	IR-324M	IR-322MB	IR-324MB
		5 mm		5 TMI= / 1 10/	0 mm	50 mm	
Target precursor /		DEZn / 10 vol%		TEGa / 1 vol%	, TMIT / 2.5 V01% , % , TMGa / 1 vo1%	B ₂ H ₆ 10 vol% /	/ H ₂ or He
Management concentration range	IPA / 5 vol% , IPA / 10 vol% TMAI / 2 vol% , DEZn / 2.5 vol% , IPA / 1 vol%						
Repeatability *2	≤ 0.5 % of full scale						
Linearity *2				≤ 1.0 % of full scale			
Accuracy *3				\leq 1.0 % of full scale			
Zero drift *2				\leq 1.0 % of full scale/day			
Response (T90) *4				≤ 4 sec			
Sensor response	≤ 0.4 sec 100 000 kp- (4)						
Operating pressure range ^2^3	30-300 κ/a (A) 500 μPa (Δ)						
Operating flow rate range *2*5				50-1000 SCCM			
Operating ambient temperature			15-35 °C			20-35 °(C
Setting gas cell temperature	60 °C (Need temperature controller prepared by users) *6 Non-heated						
Gas cell temperature sensor	lype K Thermocouple (Connector type : OMEGA SMP-K-F)						
Thermal switch	1 bour or more						
Watting up time	Hour of more Body : SUS316L, Gas cell window : Sapohire. Ad. Cu. Ti. Ni *7 Body : SUS316L. Gas cell window : Sapohire. Ni. Al						
Leak integrity	$\leq 5 \times 10^{-12}$ Pa·m ³ /s (He)						
Fitting				1/4 inch VCR male or equival	lent		
Communication interface	Analog / RS-485	DeviceNet™	CC-Link [®]	Analog / RS-485	DeviceNet™	Analog / RS-485	DeviceNet™
Power Main unit	\pm 15 VDC / 3.8 W	DC24 V / 12 W	DC24 V ±10 % / 12 W	± 15 VDC / 3.8 W	DC24 V / 12 W	± 15 VDC / 3.8 W	DC24 V / 12 W
requirement Gas cell heater		200-240 VAC, Maximum	50 VA (Connector type : Mole	ex Standard 093 1545-P1)	I THE PARTY IN THE PARTY	-	
Dimensions			124 mm(W) × 50.8	IIIIII(U) × 135 mm(H) *8 No	LINCLUAING PROTRUSIONS		
Weight		Approx. 1.2 kg		Anna	px. 1.5 kg	Annrox 1 F	ō ka
*1 Please contact HORIBASTEC regardin	o precursor and/or full-scale cor	ncentration other than those shown	*4 Gas replacement time (Td: Tir	me delay) is not included in the res	ponse. The typical Td *6 Requi	ired specification of temperature controller P	ID operation by auto tuning.
above. *2 The specification is guaranteed under the standard conditions of HORIBASTEC. Ambient temperature: 32-6 YG as cell temperature: 36-9 C/ Measurement flow rate: 1000 SCCM / Calibration gas: C/H _i balanced in N ₂ at 105 kPa (A). *3 Accuracy is based on concentration of the calibration gas.							
Selecting a mod	el						
	Target pre	ecursor1/ Target p	recursor2/ Tarc	get precursor3/			
IR-3 1 4	M , full-scale co	oncentration ' full-scale of	concentration ' full-s	cale concentration '	Т 1 3,	200 K 60 , 4CR	L , A
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O Can call appaifing	tion		• A Connector	nocition . Ten of eac			
	uon		O Connector	position : top of cas	se u	neater set temperature	
1 5 mm cell* *	CC-Link®: 5 mm cell	only	O Number of	calibration curve		60 60 °C (standard	I)
2 50 mm cell			1 (One component*		AMB Non-heated (op	otion)*
Ocommunication n	node	Model type	е 2 т	wo components (Optic	on)	*Available for IPA 1 vol% and 5 vol*	%
2 Analog & RS	S-485 / F-net Protoco	M:Standard	3 т	Three components (Opt	ion)	otherwise concentration accuracy	is out of guarantee.
4 DeviceNet™	1* *If selecting DeviceNet	MB:B2H6 ™,	*If selecting MB	from 3, please choose "1"		*If selecting MB from 3, please ch	noose "AMB"
5 CC-Link®	please choose	ก	-		_		
	full-scale concen	tration	DeviceNet	™ output range	Ũ	Fitting : 1/4 inch VCR male	e or equivalent,
Please select the desir	red target precursor a	and full scale concentration	Blank	Other than DeviceNet™ mod	lel	Fitting to fitting dir	mention 124 mm
	0.1		1 0	Concentration output full sca	le "100 %F.S." 🛛 🕫	Cell window brazing	
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