

Tough & Equipped SUS used (able to 1) and (b) and (c) and (c)

Equipped with a high-reliability optical interferometric sensor SUS used for gas contact parts (able to handle corrosive gases)

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Enhanced self-diagnostic function (compatible with MODBUS communications) Easier maintenance

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For Controlling and Measuring Gas Concentrations

Optical Interferometric Gas Monitor

Model FI-900

ATEX IECEx TIIS(Japan Ex) <u>CE Marki</u>ng





Tough

Equipped with a high-reliability optical interferometric sensor

Measurement principle:

The gas concentration is detected from the amount of movement of interference fringes that occur due to the difference in the refractive indexes of the sample gas and reference gas.

Features: almost no degradation of sensor sensitivity. Even if the light source level drops, there is no change in

the positions of interference fringes. = no change in sensor sensitivity.



This design differs from ordinary optical sensors as it is less susceptible to decreases in light source level or a dirty chamber, and as there is no change in the sensitivity, it is a high-reliability sensor.

SUS used for gas contact parts

(able to handle corrosive gases)

SUS is used for gas contact parts, which means it can be used for explosion prevention for NH_3 and high-concentration hydrogen that the previous unit was not capable of. (SUS specifications for sensor part available as an option)

Smart

Enhanced self-diagnostic function (compatible with MODBUS communications)

The FI-900 has enhanced self-diagnostic functions to constantly monitor self-diagnostic parameters like the 10 items shown in the table on the right, while diagnosing operating conditions of the device or its usage environment.

It is compatible with MODBUS communications to constantly monitor not only gas concentrations but also the state of the measurement device. Log data is also recorded on the measurement device, and can be checked to identify causes quickly on site if faults occur with the device.



Table Self-diagnostic monitoring parameters (excerpt)

	Constant monitoring	Logging
Sensor output	0	0
Sensor temperature	0	0
GAS flow rate	0	0
REF.GAS flow rate	0	0
GAS OUT absolute pressure	0	0
Light source voltage	0	—
Interference fringes light level	0	0
Interference fringes contrast	0	—
4 to 20 mA output conditions	0	—
Power supply voltage	0	—

* Monitors a total of 35 items including the 10 items above.

Improved maintenance

The FI-900 comprises three simple units. If faults are identified with the self-diagnostic function, only faulty units need to be replaced, which means the device can be quickly restored for use on the field.





(1) Optical sensor unit(2) Main controller(3) Power supply unit



Illustration of unit replacement



Device with each unit mounted inside

Broad range of gases measured

Measurements are conducted using gas-specific refractive indexes capable of a broad range of gas measurement, making it capable of measuring over 80 types of gases.

Measurement of additional gas types is also possible to suit requirements (gases in the list are an example). In addition to air and nitrogen, the sensor can also be used with various base gases such as argon and CO₂.

[0 -100% LEL]

Measuring Gas	Measurement Range	Base Gas
Butadiene	0 -100% LEL	Air
2,3,3,3-Tetrafluoropropene	0 -100% LEL	Air
Acetone	0 -100% LEL	Air
Acetonitrile	0 -100% LEL	Air
Acrylonitrile	0 -100% LEL	Air
Benzene	0 -100% LEL	Air
Cyclohexane	0 -100% LEL	Air
Cyclopentanone	0 -100% LEL	Air
Dichloromethane	0 -100% LEL	Air
Dimethyl ether	0 -100% LEL	Air
Ethane	0 -100% LEL	Air
Ethyl alcohol	0 -100% LEL	Air
Ethyl acetate	0 -100% LEL	Air
Ethylcyclohexane	0 -100% LEL	Air
Ethylene	0 -100% LEL	Air
Hydrogen	0 -100% LEL	Air/N ₂
Isoprene	0 -100% LEL	Air
Isopropyl alcohol	0 -100% LEL	Air
M-Xylenehexafluoride	0 -100% LEL	Air
Methyl alcohol	0 -100% LEL	Air
Methyl ethyl ketone	0 -100% LEL	Air
Methyl isobutyl ketone	0 -100% LEL	Air
Methyl methacrylate	0 -100% LEL	Air
Methylcyclohexane	0 -100% LEL	Air
Butyl acetate	0 -100% LEL	Air
Normal heptane	0 -100% LEL	Air
Normal hexane	0 -100% LEL	Air
Normal propyl alcohol	0 -100% LEL	Air
Propane	0 -100% LEL	Air
R-454C	0 -100% LEL	Air
Styrene	0 -100% LEL	Air/N ₂
Toluene	0 -100% LEL	Air
Polyvinyl chloride	0 -100% LEL	Air
Xvlene	0 -100% FI	Air

[0-100 vol%]

Measuring Gas	Measurement Range	Base Gas
Ammonia ^{*1}	0-100 vol%	N ₂
Carbon dioxide	0-100 vol%	Air/N₂/ Hydrogen
Deuterium	0-100 vol%	Air
Ethylene	0-100 vol%	N ₂
Hydrogen ^{*1}	0-100 vol%	Air/N ₂ /CO ₂ Argon/ Methane
Methane	0-100 vol%	Air
FC218	0-100 vol%	Air
Propane	0-100 vol%	N ₂
Sulfur hexafluoride	0-100 vol%	Air

[0-50 vol%]

Measuring Gas	Measurement Range	Base Gas
Butadiene	0-50 vol%	N ₂
Carbon dioxide	0-50 vol%	Argon
Chlorofluorocarbon 22	0-50 vol%	N ₂
Hydrogen	0-50 vol%	N ₂
Propylene	0-50 vol%	N ₂

[0-20 vol%]

Measuring Gas	Measurement Range	Base Gas
Dichloromethane	0-20 vol%	Air
Ethylene	0-20 vol%	Air/N ₂
Hydrogen	0-20 vol%	N ₂
Propylene	0-20 vol%	N ₂

[0-10 vol%]

Measuring Gas	Measurement Range	Base Gas
Carbon dioxide	0-10 vol%	Air
Dichloromethane	0-10 vol%	Air
Hydrogen	0-10 vol%	N ₂
Normal hexane	0-10 vol%	Air/N ₂
Propylene	0-10 vol%	N ₂

[Others]

Measuring Gas	Measurement Range	Base Gas
Normal heptane	0-8 vol%	N ₂
Acetone	0-5 vol%	N ₂
Benzene	0-5 vol%	Air
Carbon dioxide	0-5 vol%	Air
Deuterium	0-5 vol%	N ₂
Dichloromethane	0-5 vol%	Air
Ethyl acetate	0-5 vol%	Air
Hydrogen	0-5 vol%	N ₂
Methane	0-5 vol%	Air
Normal hexane	0-5 vol%	N ₂
Propylene	0-5 vol%	N ₂
Butadiene	0-2 vol%	N ₂
Dichloromethane	0-2 vol%	Air
Ethylcyclohexane	0-1 vol%	Air
Methylcyclohexane	0-1 vol%	Air
Toluene	0-1 vol%	Air
Trichloroethylene	0-1 vol%	Air
Hydrogen	40-100 vol%	Methane

*1 Specify the optional SUS sensor part.

Contact us for other gas types.

Designed to suit various customer requirements—gas concentration measurements, gas concentration control, purity measurements, explosion prevention!





Use: hydrogen purity measurement

Petroleum refining

Use: hydrogen concentration measurement

during hydrodesulfurization process

Painting (such as automobile painting)



Use: VOC concentration control, explosion prevention

Petrochemicals (VCM plants, etc.)



Use: VCM and other process gas concentration measurement

Gravure printing



Use: VOC concentration control, explosion prevention





Use: CO₂ concentration measurement

Specifications

Modol	EL 000
Model Moasuring principlo	Optical interforometric method
Measuring philoipie	Combustible gases solvent vanors inert gases
Measuring gas	Depending on gas specifications
Alarm satpoint	
Moasuring accuracy	Equilibrium of year specifications $F_{\rm S}$ within $\pm 3\%$ (under some conditions) refer to concrete "Specifications for measuring gas "
Response time	Table within $\pm 5\%$ (under same conditions, refer to separate "Specifications for measuring gas.")
Moasuring method	Specified flow gas food from external sampling unit
Display function	
External output	4 to 20 mA DC (inculated current throw two), permitted resistive lead 300 Q or less, minimum resolution 0.01 mA or less
	PS 485 (MODRUS) communication function
Alarm relay contact 7	Non-voltage contact, contact capacity 1 A 30 V DC (resistive load)
	Non-voltage contact, contact capacity 1 A 30 V DC (resistive load)
Pauli alarm contact	24 V DC : 10% / 100 V to 240 V AC : 10% 50/60 Ltz * *The ATEX//ECEV apacifications apply to DC power source only
Fower supply	Max 6 W (24 V DC + 10%) / Max 20 V/0 (100 V to 240 V AC + 10% 50/60 Hz)
Power consumption	*The ATEX/IECEx specifications apply to DC power source only
Protection class	IP66/67 or equivalent
Operating temperature	-20 to +60°C (ATEX/IECEx specifications) / -20 to +57°C (Japan Ex specifications)
range	(no sudden changes)
Operating humidity range	95% RH or less (no condensation/use of condensible gases within unit) (no condensation)
Usage pressure range	Atmospheric pressure or equivalent (no pulses)
Outer dimensions	Approx. 286 (W)x 453 (H) x 150 (D) mm (excluding protrusions)
Weight	Approx. 23 kg
Explosion-proof structure	Flameproof enclosures
	II 2G Ex db II B+H₂ T4 Gb (ATEX)
Explosion-proof class	Ex db $IIB+H_2$ T4 Gb (IECEx)
	Ex d $IIB+H_2$ T4 (Japan Ex)
	Status monitoring in 4 separate categories
Self-diagnostic	
function	
٨	•UUT OF SPECIFICATION
ACCESSONES	Control key, Allen key (size 2, size 6), cable ground, plug, tuse (250 V 1A)



* This detector must be used in combination with a sampling unit. Contact us if you require a sampling unit.

Illustration of piping for pump suction type



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