PC2E-0371

RIKEN KEIKI

Featuring the next-generation high-performance F Sensors to meet a wide range of global standards

Gas Detector with Signal Converter

Model SD-3 Series

ATEX certified (ATEX: European directive for equipment for potentially explosive atmospheres)

IECEx certified (IEC explosion-proof electrical equipment standard test)

Japan Ex certified (certificate of conformity for electrical equipment used in potentially explosive atmospheres)

Functional safety standard certified

RIKEN KEIKI Co., Ltd.

The SD-3 Series of fixed explosion-proof gas detectors detect combustible gas and toxic gas leaks and continuously monitor oxygen levels in the surrounding atmosphere.
These global products are certified explosion-proof in various countries (some scheduled) and meet the requirements of various international standards, including IEC/EN performance and SIL 2 certification.

1 *Featuring the next-generation high-performance F Sensors*
- *Compatible with a wide range of toxic gases*
- *Double range capability*

2 *Wide range of output options*

3 *Suitable for a variety of uses and installation environments*

4 *Complies with wide range of global standards*

5 *Rugged housing*

Features

1

Incorporates the next-generation high-performance F sensors for dramatically improved functionality and performance

- 3-year sensor warranty
  * Specific sensors excluded. Assumes the sensor is inspected at least once a year.
- Operating temperature range: -40 - +70 °C
  * Specific sensors excluded
- IEC/EN performance compliance scheduled
  * Specific sensors excluded
- Sensor degradation and life assessment function
  The degradation and life assessment function notifies the user with a warning when the sensor needs to be replaced.

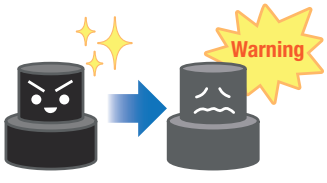
[Sensor degradation assessment]

The individual sensor principle characteristics are used to automatically diagnose sensor degradation (e.g., reduced zero point output and low electrolyte levels).

[Life assessment]

Diagnoses sensor life during calibration by predicting the sensor output reserve value based on past calibration history.

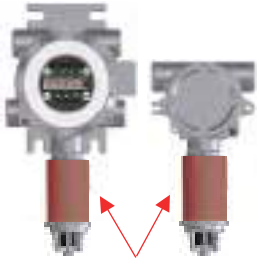
* The sensor degradation and life assessment warning is output as a digital signal (HART or RS-485 communication).



Compatible with a wide range of toxic gases

Devices in the SD-3EC Series lineup feature an intrinsically safe explosion-proof barrier integral construction (Flame-proof enclosure + intrinsically safe explosion-proof construction). This eliminates the need for sintered metal in the sensor and allows detection of a wide range of highly adsorptive toxic gases.

* Compatible models: SD-3ECB, SD-3DECB, GD-3ECB
  For more information, refer to the F sensor list (with barrier).


Intrinsically safe explosion-proof barrier

Double range capability
(NC type)

Double ranges in the form of low concentration (ppm) and lower explosive limit (LEL) can be detected with a single device. This allows measurement of a wide range of concentrations with greater accuracy.

* Not compatible with HART communication
* Not SIL compliant

2 Wide range of output options

The SD-3 Series also supports Modbus (RS-485) communication in addition to 4 - 20 mA output with HART (support planned). Three relay contacts are also available (ALARM1, ALARM2, and FAULT). Select any of the following three types to suit specific uses:

① 4 - 20 mA signal with HART communication [standard]
② 4 - 20 mA signal with HART communication + contact (3c) [optional]
③ 4 - 20 mA signal + Modbus (RS-485) communication [optional; future support planned]

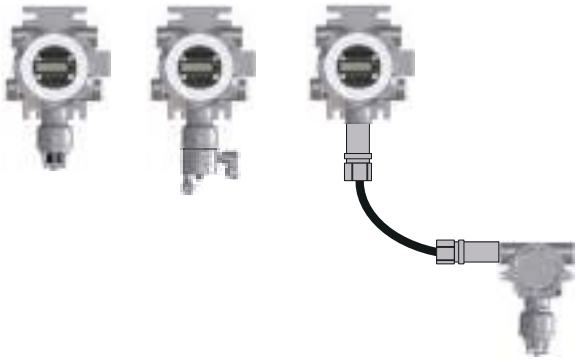
3 Wide range of types to suit a variety of uses and installation environments

The SD-3 Series lineup includes diffusion type, suction type, remote type, and duct insertion type models. Select the optimal detection method to suit specific uses. Using a suction type model in conjunction with an external pump allows use in limited installation space and high places where maintenance work is not possible.

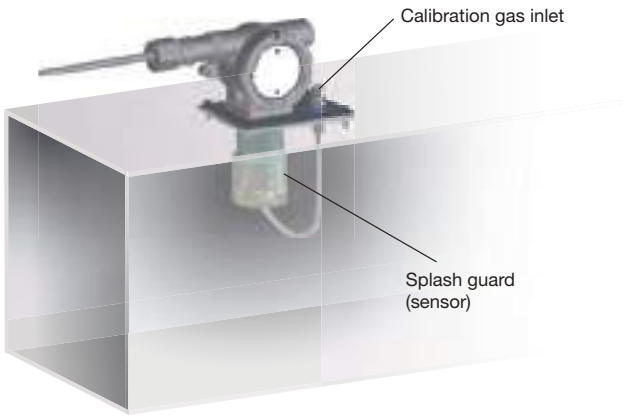
[Remote type/Duct insertion type]

Use a remote sensor to allow sensor installation up to 20 m from the detector main unit. An optional duct mount kit (sold separately) can be used for insertion inside a duct.

[Diffusion type] [Suction type] [Remote type]



[Duct insertion type]



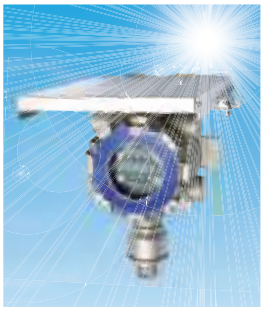
4 Complies with wide range of global standards

Explosion-proof certifications in different countries	ATEX/IECEx, Japan Ex (Japan), FM/cFM*
Performance	IEC/EN performance compliance* Combustible gas: IEC/EN 60079-29-1 Toxic gas: EN 45544-2 Oxygen: EN 50104
Miscellaneous	CE marking (ATEX Directive, EMC Directive, RoHS Directive), SIL2 Certification (IEC 61508), MED Certification*, HART communication

* Pending or due to be certified

5 Rugged housing construction allows use even in harsh environments

- Housing material: SCS14 stainless steel (equivalent to SUS316)
- Protection rating: Equivalent to IP66/67
- Wide range of operating temperatures (-40 - +70 °C)
  * -20 - +70 °C for Japan Ex
- Extensive range of optional accessories: protective cover, splash guard, lightning arrester (Japan Ex not supported), various filters, etc.



With sunshade fitted

With splash guard fitted

Detection principles and detection target gases by model

The SD-3 Series consists of the following models, which vary by sampling method and detection principle. Please select the appropriate model for the intended use.

[List of detection target gases by model]

Model	Sampling method	Detection principle	Detection target gas			Nameplate color	Remarks
			Combustible gas	Oxygen	Toxic gas		
SD-3RI	Diffusion type	IRF: Non-dispersive infrared type	○		○	Red	
SD-3DRI	Suction type						
SD-3NC	Diffusion type	NCF: New ceramic type (catalytic type)	○			Red	
SD-3DNC	Suction type						
SD-3GH	Diffusion type	SGF: Semiconductor type	○		○	Yellow	
SD-3DGH	Suction type						
SD-3GHS	Diffusion type				○	Yellow	CS_2 (carbon disulfide) only
SD-3DGHS	Suction type						
SD-3SP	Diffusion type	SHF: Hot-wire semiconductor type	○		○	Blue	
SD-3DSP	Suction type						
SD-3EC	Diffusion type	ESF: Electrochemical type		○	○	Yellow/silver	Toxic gas: Yellow certification plate Oxygen: Silver certification plate
SD-3DEC	Suction type						
SD-3ECS	Diffusion type				○	Yellow	H_2S (hydrogen sulfide) only
SD-3DECS	Suction type						
SD-3ECB	Diffusion type				○	Yellow	With EC barrier*
SD-3DECB	Suction type						

* Differs depending on detection target gas. For more information, refer to the F sensor list on the following page.

[List of detection target gases by model (remote type)]

Model (Main unit)	SD-3SC

Main unit model (Remote sensor unit)	Sampling method	Detection principle	Detection target gas			Nameplate color	Remarks
			Combustible gas	Oxygen	Toxic gas		
GD-3RI	Diffusion type	IRF: Non-dispersive infrared type	○		○	Red	
GD-3NC		NCF: New ceramic type (catalytic type)	○			Red	
GD-3GH		SGF: Semiconductor type	○		○	Yellow	
GD-3GHS					○	Yellow	CS_2 (carbon disulfide) only
GD-3SP		SHF: Hot-wire semiconductor type	○		○	Blue	
GD-3EC		ESF: Electrochemical type		○	○	Yellow/silver	Toxic gas: Yellow certification plate Oxygen: Silver certification plate
GD-3ECS					○	Yellow	H_2S (hydrogen sulfide) only
GD-3ECB					○	Yellow	With EC barrier*

* Differs depending on detection target gas. For more information, refer to the F sensor list on the following page.

Certification plate: Red

Certification plate: Blue

Certification plate: Yellow

Certification plate: Silver

F sensor list

Detection principle	Product No.	Sensor model	Gas name	Chemical formula	F.S.	1 digit	Calibration gas (replacement gas)	Operating temperature range (no sudden changes)	Operating humidity range (no condensation)	With/ without barrier	Functional safety IEC 61508	Remarks
IRF	6201 02	IRF-1301	Methane	CH_4	100 %LEL	0.5 %LEL	CH_4	-40 °C - 70 °C	95 %RH or less	–	○	
	6212 03	IRF-1303	Isobutane	C_4H_{10}	100 %LEL	0.5 %LEL	i-C_4H_{10}	-40 °C - 70 °C	95 %RH or less	–	○	
	6212 02	IRF-1317	Propane	C_3H_8	100 %LEL	0.5 %LEL	C_3H_8(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6205 02	IRF-1435	Carbon dioxide	CO_2	2,000 ppm	1 ppm	CO_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6205 03	IRF-1436	Carbon dioxide	CO_2	5,000 ppm	10 ppm	CO_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6205 04	IRF-1433	Carbon dioxide	CO_2	10,000 ppm	10 ppm	CO_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6205 12	IRF-1437	Carbon dioxide	CO_2	2 vol%	0.005 vol%	CO_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6205 13	IRF-1438	Carbon dioxide	CO_2	5 vol%	0.01 vol%	CO_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6205 14	IRF-1439	Carbon dioxide	CO_2	10 vol%	0.01 vol%	CO_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6201 03	IRF-1334	Methane	CH_4	100 vol%	0.5 vol%	CH_4	-40 °C - 70 °C	95 %RH or less	–	○	
	6201 04	IRF-1316	Ethylene	C_2H_4	100 %LEL	0.5 %LEL	C_2H_4(CH_4)	-40 °C - 70 °C	95 %RH or less	–	–	
	6213 02	IRF-1340	Isobutylene	C_4H_8	100 %LEL	0.5 %LEL	i-C_4H_8(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6212 04	IRF-1308	N-hexane	C_6H_{14}	100 %LEL	0.5 %LEL	n-C_6H_{14}(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	–	
	6201 05	IRF-1332	Butadiene	C_4H_6	100 %LEL	0.5 %LEL	C_4H_6(CH_4)	-40 °C - 70 °C	95 %RH or less	–	–	
NCF	6000 07	NCF-6318	Ethane	C_2H_6	100 %LEL	0.5 %LEL	C_2H_6(CH_4)	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 14	NCF-6318	Propane	C_3H_8	100 %LEL	0.5 %LEL	C_3H_8(CH_4)	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 19	NCF-6318	Methane	CH_4	100 %LEL	0.5 %LEL	CH_4	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 20	NCF-6318	Methane	CH_4	2 vol%	0.01 vol%	CH_4	-40 °C - 70 °C	95 %RH or less	–	–	
	6000 21	NCF-6318	Methane	CH_4	20,000 ppm	100 ppm	CH_4	-40 °C - 70 °C	95 %RH or less	–	–	
	6000 45	NCF-6320	Hydrogen	H_2	100 %LEL	0.5 %LEL	H_2	-40 °C - 70 °C	95 %RH or less	–	○	Hydrogen selective
	6000 23	NCF-6320	Hydrogen	H_2	2 vol%	0.01 vol%	H_2	-40 °C - 70 °C	95 %RH or less	–	–	Hydrogen selective
	6000 24	NCF-6320	Hydrogen	H_2	2,000 ppm	10 ppm	H_2	-40 °C - 70 °C	95 %RH or less	–	–	Hydrogen selective
	6000 25	NCF-6319	Isobutane	C_4H_{10}	100 %LEL	0.5 %LEL	i-C_4H_{10}	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 26	NCF-6319	Hydrogen	H_2	2 vol%	0.01 vol%	H_2	-40 °C - 70 °C	95 %RH or less	–	–	
	6000 27	NCF-6319	Hydrogen	H_2	100 %LEL	0.5 %LEL	H_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 28	NCF-6319	N-hexane	C_6H_{14}	2,000 ppm	10 ppm	n-C_6H_{14}(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	–	
	6000 29	NCF-6319	Hydrogen	H_2	1 vol%	0.01 vol%	H_2	-40 °C - 70 °C	95 %RH or less	–	–	
	6000 30	NCF-6319	Isopropyl alcohol	C_3H_8O	100 %LEL	0.5 %LEL	IPA(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 31	NCF-6319	Toluene	$C7H_8$	100 %LEL	0.5 %LEL	$C7H_8$(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 32	NCF-6319	Acetone	C_3H_6O	100 %LEL	0.5 %LEL	C_3H_6O(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 33	NCF-6319	Hydrogen	H_2	4 vol%	0.02 vol%	H_2	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 34	NCF-6319	N,N-dimethylacetamide	C_4H_9NO	4,000 ppm	20 ppm	DMAC(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	–	
	6000 35	NCF-6319	Acetylene	C_2H_2	100 %LEL	0.5 %LEL	C_2H_2(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 36	NCF-6319	Ethylene	C_2H_4	100 %LEL	0.5 %LEL	C_2H_4(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 37	NCF-6319	Normal octane	C_8H_{18}	100 %LEL	0.5 %LEL	C_8H_{18}(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	–	
	6000 38	NCF-6319	Ethyl alcohol	C_2H_6O	100 %LEL	0.5 %LEL	C_2H_5OH(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 39	NCF-6319	Methyl alcohol	CH_4O	100 %LEL	0.5 %LEL	CH_3OH(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 40	NCF-6319	Propylene	C_3H_6	100 %LEL	0.5 %LEL	C_3H_6(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 41	NCF-6319	Vinyl chloride	C_2H_3CL	100 %LEL	0.5 %LEL	VCM(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 48	NCF-6319	Isobutylene	i-C_4H_8	100 %LEL	0.5 %LEL	i-C_4H_8(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
	6000 49	NCF-6319	Butadiene	C_4H_6	100 %LEL	0.5 %LEL	C_4H_6(i-C_4H_{10})	-40 °C - 70 °C	95 %RH or less	–	○	
SGF	6030 04	SGF-8562	Carbonyl sulfide	COS	2,000 ppm	10 ppm	COS(C_2H_5OH)	-20 °C - 65 °C	20 - 95 %RH	–	–	
	6030 05	SGF-8562	Carbon disulfide	CS_2	200 ppm	1 ppm	CS_2	-20 °C - 65 °C	20 - 95 %RH	–	–	
	6030 06	SGF-8563	Ethylene oxide	C_2H_4O	100 ppm	1 ppm	EO	-20 °C - 65 °C	20 - 95 %RH	–	–	
	6030 07	SGF-8562	Hydrogen sulfide	H_2S	100 ppm	1 ppm	H_2S	-20 °C - 65 °C	20 - 95 %RH	–	–	
SHF	6060 01	SHF-8601	Methane	CH_4	5,000 ppm	25 ppm	CH_4	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 02	SHF-8601	Isobutane	C_4H_{10}	2,000 ppm	10 ppm	i-C_4H_{10}	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 04	SHF-8601	Ethylene	C_2H_4	2,000 ppm	10 ppm	C_2H_4	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 05	SHF-8601	Acetylene	C_2H_2	2,000 ppm	10 ppm	C_2H_2	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 06	SHF-8601	Propylene	C_3H_6	2,000 ppm	10 ppm	C_3H_6	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 07	SHF-8601	N-hexane	C_6H_{14}	200 ppm	1 ppm	n-C_6H_{14}	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 08	SHF-8601	Octane	C_8H_{18}	2,000 ppm	10 ppm	C_8H_{18}	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 09	SHF-8601	Fluoromethane	CH_3F	2,000 ppm	10 ppm	R-41	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 10	SHF-8601	Difluoromethane	CH_2F_2	2,000 ppm	10 ppm	R-32	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 11	SHF-8601	Difluoromethane	CH_2F_2	5,000 ppm	25 ppm	R-32	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 12	SHF-8601	Isopropyl alcohol	C_3H_8O	2,000 ppm	10 ppm	IPA	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 13	SHF-8601	Hexafluoro-1,3-butadiene	C_4F_6	2,000 ppm	10 ppm	C_4F_6(i-C_4H_{10})	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 14	SHF-8601	1,2-dichloroethylene	$C_2H_2CL_2$	600 ppm	5 ppm	$C_2H_2CL_2$	–30 °C - 70 °C	20 - 95 %RH	–	–	
	6060 18	SHF-8601	Carbon monoxide	CO	1,000 ppm	10 ppm	CO	0 °C - 70 °C	20 - 95 %RH	–	–	
	6060 15	SHF-8603	Hydrogen	H_2	500 ppm	5 ppm	H_2	–30 °C - 70 °C	20 - 95 %RH	–	–	Hydrogen selective
	6060 16	SHF-8603	Hydrogen	H_2	1,000 ppm	10 ppm	H_2	–30 °C - 70 °C	20 - 95 %RH	–	–	Hydrogen selective
	6060 03	SHF-8603	Hydrogen	H_2	2,000 ppm	10 ppm	H_2	–30 °C - 70 °C	20 - 95 %RH	–	–	Hydrogen selective
	6060 17	SHF-8603	Deuterium	D_2	2,000 ppm	10 ppm	D_2(H_2)	–30 °C - 70 °C	20 - 95 %RH	–	–	Hydrogen selective
ESF	6100 28	ESF-A24RH	Hydrogen sulfide	H_2S	30 ppm	0.2 ppm	H_2S	-40 °C - 70 °C	40 - 95 %RH	Without barrier	–	High-humidity compatible sensor
	6100 04	ESF-A24R	Hydrogen sulfide	H_2S	100 ppm	1 ppm	H_2S	-40 °C - 70 °C	20 - 90 %RH	Without barrier	○	–
	6100 06	ESF-A24A	Nitrogen dioxide	NO_2	15 ppm	0.1 ppm	NO_2	-40 °C - 70 °C	20 - 90 %RH	With barrier	Future support planned	–
	6100 34	ESF-X24P2	Oxygen	O_2	25 %	0.1 %	N_2	-40 °C - 70 °C	20 - 90 %RH	Without barrier	Future support planned	–
	Scheduled to be added to lineup		Ammonia	NH_3	75 ppm	0.5 ppm	–	–	–	–	–	–
	Scheduled to be added to lineup		Chlorine	CL_2	1.5 ppm	0.01 ppm	–	–	–	–	–	–
	Scheduled to be added to lineup		Carbon monoxide	CO	150 ppm	1 ppm	–	–	–	–	–	–
	Scheduled to be added to lineup		Hydrogen chloride	HCL	15 ppm	0.1 ppm	–	–	–	–	–	–

* Please contact Riken Keiki for information on other gas types and detection ranges.

IRF
Non-dispersive infrared type

NCF
New ceramic type (catalytic type)

SGF
Semiconductor type

SHF
Hot-wire semiconductor type

ESF
Electrochemical type

[SD-3 Series Specifications]

Model	Diffusion type	SD-3RI	SD-3NC	SD-3GH	SD-3GHS	SD-3SP	SD-3EC	SD-3ECS	SD-3ECB
	Suction type	SD-3DRI	SD-3DNC	SD-3DGH	SD-3DGHS	SD-3DSP	SD-3DEC	SD-3DECS	SD-3DECB
Detection principle		Non-dispersive infrared type	New ceramic type (catalytic type)	Semiconductor type		Hot-wire semiconductor type	Electrochemical type		
Detection target gas		Combustible gas/toxic gas/oxygen; detection range depends on detection target gas.							
Display		7-segment LED (5 digits) and 3-color lamps (red/green/yellow)							
Sampling method		Diffusion/Suction (introduced via an external unit)							
Set flow rate		0.4 - 1.5 L/min							
Gas alarm type		Two-step alarm (H-HH or H-L or L-LL)							
Fault alarm/self-diagnosis		System abnormality (E-9)/sensor abnormality (E-1)							
Warning		Sensor life assessment/clock abnormality diagnosis/communication diagnosis/sensor warning							
Gas concentration output	Standard	Gas concentration output (4 - 20 mA with HART), 4 - 20 mA DC (non-insulated, linear output), load resistance 600 Ω or less, maximum resolution 250 divisions (depending on specifications)							
	Option	RS-485 (half duplex)							
Contact output (optional)		SPDT (2 alarms, 1 fault output operation), 250 V 2 A AC, 30 V 1 A DC (resistance load), minimum load 5 V 0.1 A DC							
Power supply		24 V DC (18 V - 30 V DC)							
Power consumption		Maximum 3.8 W	Maximum 4.5 W	Maximum 4.5 W	Maximum 4.5 W	Maximum 3.5 W	Maximum 2.8 W	Maximum 2.8 W	Maximum 3.1 W
Cable connectors		Japan Ex: Pressure-proof seal cable glands (M20 × 1.5/M25 × 1.5) (Compatible cable diameter 6.0 - 16.0 mm) ATEX/IECEx: M25 × 1.5, adapters (option): NPT3/4, NPT1/2, M20 × 1.5							
Operating temperature/ humidity range		Japan Ex: -20 - +70 °C (no sudden changes), ATEX/IECEx: -40 - +70 °C (no sudden changes) 0 - 95 %RH or less (no condensation) or, if restrictions apply, in accordance with sensor specifications							
Housing material		SCS14 stainless steel (equivalent to SUS316)							
Protection level		IP66/67 equivalent							
External dimensions (excluding cable gland projections)	Diffusion type	Approximately 171 (W) × 277 (H) × 127 (D) mm							Approximately 171 (W) × 322 (H) × 127 (D) mm
	Suction type	Approximately 171 (W) × 289 (H) × 127 (D) mm							Approximately 171 (W) × 334 (H) × 127 (D) mm
Weight (excluding cable glands)	Diffusion type	Approximately 6.7 kg							Approximately 7.3 kg
	Suction type	Approximately 7.0 kg							Approximately 7.6 kg
Explosion-proof construction		Flame-proof enclosure							Flame-proof enclosure + Intrinsically safe explosion-proof construction
Explosion-proof certification	ATEX	II 2G Ex db IIC T6/T5 Gb	II 2G Ex db IIC T5/T4 Gb	II 2G Ex db IIC T5/T4 Gb	II 2G Ex db IIC T6/T4 Gb	II 2G Ex db IIC T5/T4 Gb	II 2G Ex db IIC T4 Gb	II 2G Ex db IIC T4 Gb	II 2G Ex db ia IIC T4 Gb
	IECEx	Ex db IIC T6/T5 Gb	Ex db IIC T5/T4 Gb	Ex db IIC T5/T4 Gb	Ex db IIC T6/T4 Gb	Ex db IIC T5/T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db ia IIC T4 Gb
	Japan Ex	Ex db IIC T5 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db ja IIC T4 Gb
Functional safety IEC 61508*		SIL2 compliant (SIL3 compliant with redundancy)	SIL2 compliant (SIL3 compliant with redundancy)	–	–	–	SIL2 compliant (SIL3 compliant with redundancy)	SIL2 compliant (SIL3 compliant with redundancy)	Pending
CE marking		ATEX Directive, EMC Directive, RoHS Directive							
HART communication		HART7							

* Select SIL certified external units when used in conjunction with suction types. For information on target gases, refer to the F sensor list.

[Remote type: SD-3SC + GD-3 Series Specifications]

Model	Main unit	SD-3SC							
	Remote sensor unit	GD-3RI	GD-3NC	GD-3GH	GD-3GHS	GD-3SP	GD-3EC	GD-3ECS	GD-3ECB
Detection principle		Non-dispersive infrared type	New ceramic type (catalytic type)	Semiconductor type		Hot-wire semiconductor type	Electrochemical type		
Detection target gas		Combustible gas/toxic gas/oxygen; detection range depends on detection target gas.							
Display		7-segment LED (5 digits) and 3-color lamps (red/green/yellow)							
Sampling method		Diffusion type							
Gas alarm type		Two-step alarm (H-HH or H-L or L-LL)							
Fault alarm/self-diagnosis		System abnormality (E-9)/sensor abnormality (E-1)							
Warning		Sensor life assessment/clock abnormality diagnosis/communication diagnosis/sensor warning							
Gas concentration output	Standard	Gas concentration output (4 - 20 mA with HART), 4 - 20 mA DC (non-insulated, linear output), load resistance 600 Ω or less, maximum resolution 250 divisions (depending on specifications)							
	Option	RS-485 (half duplex)							
Contact output (optional)		SPDT (2 alarms, 1 fault output operation), 250 V 2 A AC, 30 V 1 A DC (resistance load), minimum load 5 V 0.1 A DC							
Remote cable		Shielded twisted pair cable 1.25 sq (1.38 mm^2/AWG16), maximum 20 m between main unit (SD-3SC) and remote sensor unit (GD-3)							
Power source		24 V DC (18 V - 30 V DC)							
Power consumption	Main unit	Maximum 5.0 W							
	Remote sensor unit	Maximum 1.2 W	Maximum 2.0 W	Maximum 2.0 W	Maximum 2.0 W	Maximum 1.0 W	Maximum 1.0 W	Maximum 1.0 W	Maximum 1.0 W
Cable connectors		Japan Ex: Pressure-proof seal cable glands (M20 × 1.5/M25 × 1.5) (Compatible cable diameter 6.0 - 16.0 mm) ATEX/IECEx: M25 × 1.5, adapters (option): NPT3/4, NPT1/2, M20 × 1.5							
Operating temperature/ humidity range		Japan Ex: -20 - +70 °C (no sudden changes), ATEX/IECEx: -40 - +70 °C (no sudden changes) 0 - 95 %RH or less (no condensation) or, if restrictions apply, in accordance with sensor specifications							
Housing material		SCS14 stainless steel (equivalent to SUS316)							
Protection level		IP66/67 equivalent							
External dimensions (excluding cable gland projections)	Main unit	Approximately 171 (W) × 193 (H) × 127 (D) mm							
	Remote sensor unit	Approximately 125 (W) × 195 (H) × 88 (D) mm							Approximately 125 (W) × 240 (H) × 88 (D) mm
Weight (excluding cable glands)	Main unit	Approximately 6.0 kg							
	Remote sensor unit	Approximately 3.0 kg							Approximately 4.0 kg
Explosion-proof construction	Main unit	Flame-proof enclosure							
	Remote sensor unit	Flame-proof enclosure							Flame-proof enclosure + Intrinsically safe explosion-proof construction
Explosion-proof certification	ATEX	II 2G Ex db IIC T6/T5 Gb	II 2G Ex db IIC T5/T4 Gb	II 2G Ex db IIC T5/T4 Gb	II 2G Ex db IIC T6/T4 Gb	II 2G Ex db IIC T5/T4 Gb	II 2G Ex db IIC T4 Gb	II 2G Ex db IIC T4 Gb	II 2G Ex db ia IIC T4 Gb
	IECEx	Ex db IIC T6/T5 Gb	Ex db IIC T5/T4 Gb	Ex db IIC T5/T4 Gb	Ex db IIC T6/T4 Gb	Ex db IIC T5/T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db ia IIC T4 Gb
	Japan Ex	Ex db IIC T5 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db IIC T4 Gb	Ex db ja IIC T4 Gb
Functional safety IEC 61508*		SIL2 compliant (SIL3 compliant with redundancy)	SIL2 compliant (SIL3 compliant with redundancy)	–	–	–	SIL2 compliant (SIL3 compliant with redundancy)	SIL2 compliant (SIL3 compliant with redundancy)	Pending
CE marking		ATEX Directive, EMC Directive, RoHS Directive							
HART communication		HART7							

* For information on target gases, refer to the F sensor list.

[Terminal specifications: Power supply + 4 - 20 mA signal (with HART communication)]

<Using 3-core cable>

Terminal No.	Power supply/signal cable connection
1	Power supply (+)
2	Common (Power supply (-), signal (-))
3	Signal (+)

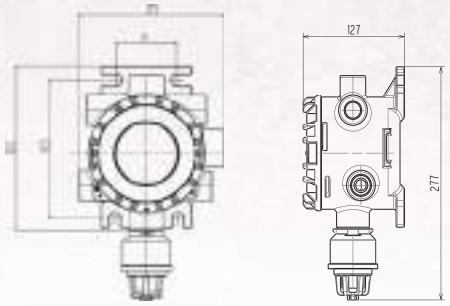
<Using 4-core cable>

Terminal No.	Power supply/signal cable connection
1	Power supply (+)
2	Power supply (-)
3	Signal (+)
4	Signal (-)

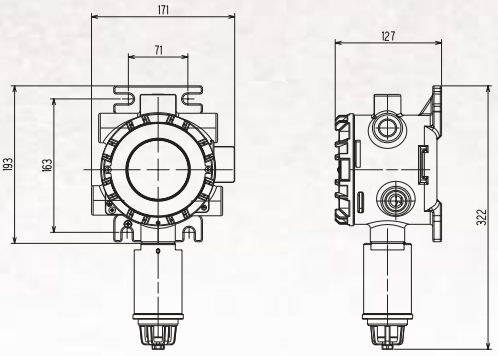
[Terminal specifications: Contact output (3c)]

Terminal No.	Cable connection
1	N.O. (Normal Open)
2	Common
3	N.C. (Normal Close)

SD-3 Series exterior drawings (excluding cable glands)

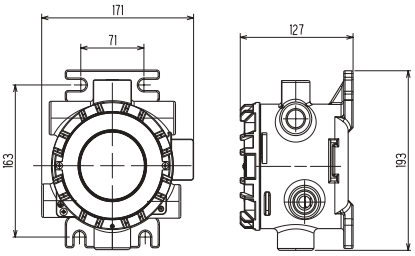


Diffusion type without EC barrier

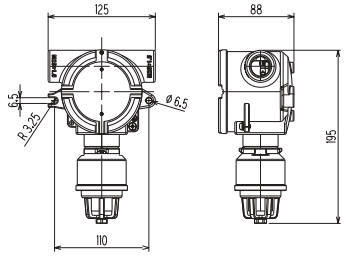


Diffusion type with EC barrier

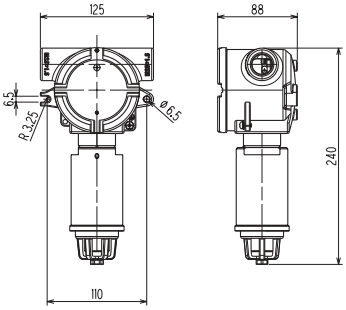
Remote type: SD-3SC + GD-3 Series exterior drawings (excluding cable glands)



Main unit (SD-3SC)



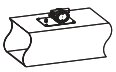
Remote sensor unit (GD-3 Series)
Diffusion type without EC barrier



Remote sensor unit (GD-3 Series)
Diffusion type with EC barrier

Optional accessories

	**Part No.: 4283 9011 00**	
	Calibration adapter (for IRF sensor)	Calibration adapter for the SD-3RI <Materials> Body: PP, nipple: stainless steel/Teflon
	**Part No.: 4283 9012 70**	
	Calibration adapter (for NCF/SGF/SHF sensors)	SD-3NC/GH/GHS/SP calibration adapter <Materials> Body: PP, nipple: stainless stainless steel/Teflon
	**Part No.: 4283 9013 40**	
	Calibration adapter (for ESF sensor)	SD-3EC/ECS/ECB calibration adapter <Materials> Body: PP, nipple: stainless steel/Teflon
	**Part No.: 4283 9019 80 (wall mounting)/4283 9045 60 (pipe mounting)**	
	Protective cover	Cover for protecting the SD-3 main unit <Material> SUS316
	**Part No.: 4283 9015 90**	
	Sunshade	Cover to minimize rise in temperature due to direct sunlight or radiant heat <Material> SUS316
	**Part No.: 4283 9018 10**	
	Blanking plug	M25 × 1.5 blanking plug <Material> Equivalent to SUS316
	**Part No.: 4283 9058 70**	
	Adapter*4	Adapter for converting M25 × 1.5 threads to 1/2NPT threads <Material> Equivalent to SUS316
	**Part No.: 4283 9057 00**	
	Adapter*4	Adapter for converting M25 × 1.5 threads to 3/4NPT threads <Material> Equivalent to SUS316
	**Part No.: 4283 9047 10**	
	Adapter*4	Adapter for converting M25 × 1.5 threads to M20 × 1.5 threads <Material> Equivalent to SUS316
	**Part No.: 2905 2439 10**	
	HART communication cable	Relay cable used when connecting a HART modem

	**Part No.: 4283 9016 60**	
	Splash guard (for IRF sensor)	Cover for protecting sensors against water and dust “1” is marked on the underside of the guard. <Material> Resin
	**Part No.: 4283 9017 30**	
	Splash guard (for NCF/SGF/SHF sensors)	Cover for protecting sensors against water and dust “2” is marked on the underside of the guard. <Material> Resin
	**Part No.: 4283 9031 80**	
	Splash guard (for ECF sensor)	Cover for protecting sensors against water and dust “3” is marked on the underside of the guard. <Material> Resin
	**Part No.: 4283 0030 20**	
	Silicone removal filter (SI-8)*1	Filter for SD-3NC/GH/GHS/SP for removing trace amounts of silicone from the air. This can extend sensor life.* 2
	**Part No.: 4283 0040 10**	
	Activated carbon filter (CF-8304)*1	Filter for SD-3NC/GH/GHS/SP for removing trace amounts of silicone from the air. Fitting the filter extends the sensor service life. The silicone removal capability of this filter exceeds that of the silicone removal filter.* 3 It can also be used to remove interference gas. This minimizes interference effects from gases other than the detection target gas.
	**Part No.: 4262 9580 80**	
	Duct mounting kit	Kit for mounting the remote sensor head on a duct <Material> SUS316
	**Part No.: 4283 9055 50**	
	Lightning arrester*4 (TP48-3-N-NDI)	Device for limiting instantaneous overvoltage due to lightning With adapter (M25 × 1.5 → 1/2NPT)
	**Part No.: 4283 9056 20**	
	Lightning arrester*4 (TP48-4-N-NDI)	Device for limiting instantaneous overvoltage due to lightning With adapter (M25 × 1.5 → 1/2NPT)
	**Part No.: 2564 0125 10**	
	Fuse	Littelfuse fuse (1.25 A, 100 V DC)
	**Part No.: 4283 9046 30**	
	U-bolt components	U-bolt, spring washer, and hex nut used for mounting the main unit on a pole (size: 50A (2B)) <Material> SUS316

*1 We recommend fitting a splash guard when using filters.
*2 Installing the silicone removal filter will limit the target gases that can be detected.
*3 Limits the range of target gases that can be detected more than when the silicone removal filter is fitted.
*4 Japan Ex not supported

Accessories

Name		Quantity	Part No.	Description
	Control key	*	4286 9200 80	Key used to operate the product
	Operating lever	×1	2594 0481 90	Tool used to connect cables to the terminal plate
	Hex key wrench (2 across flats)	*	1510 5020 40	Tool used to tighten M4 hex socket set screws

* The number will differ depending on the number of units purchased. 1 -10 units: × 1, 11 - 20 units: × 2, 21 - 50 units: × 3, 51 or more units: × 4

Order information

SD-3 ① ② (③ ④ ⑤ 0 ⑦ ⑧)

Explosion-proof application type

[Remote type: Main unit (SD-3SC) + Sensor unit (GD-3 Series)]

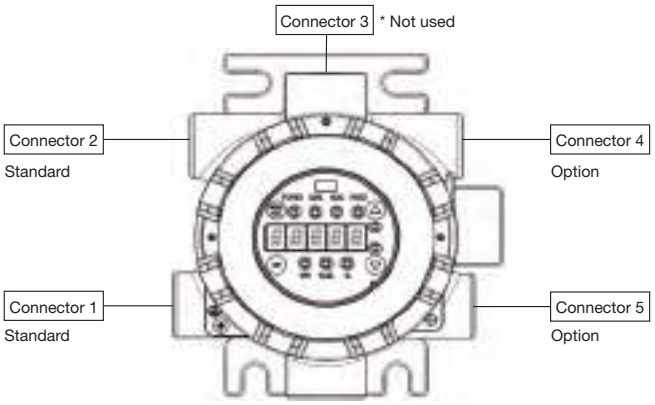
SD-3SC (③ ④ ⑤ 0 ⑦ ⑧) GD-3 ②

①	Diffusion type/suction type selection	
	Blank	Diffusion type
	D	Suction type (introduced via an external unit)
②	Sensor type selection	
	RI	Non-dispersive infrared type
	NC	New ceramic type (catalytic type)
	GH	Semiconductor type
	GHS	Semiconductor type + sintered metal (selectable for CS_2 only)
	SP	Hot-wire semiconductor type
	EC	Electrochemical type (selectable for CO/O_2 only)
	ECS	Electrochemical type + sintered metal (selectable for H_2S only)
	ECB	Electrochemical type + barrier (selectable for gases other than CO/O_2/H_2S)
③	Cable connectors (See diagram on right.)	
	0	Connector 1 + Connector 2
	1	Connector 1 + Connector 2 + Connector 4 + Connector 5
④	Explosion-proof	
	1	ATEX/IECEx
	2	—
	3	Japan EX
	4	—

⑤	Functional safety IEC 61508*1	
	0	N/A
	1	SIL (selectable with RI/NC/EC/ECS only)
⑥	Performance certification	
	0	N/A
	1	—
	2	—
	3	—

⑦	Range setting*2	
	0	Single range
	1	Double range + 4-16 (selectable with NC only)
	2	Double range + L4-20 (selectable with NC only)
	3	Double range + H4-20 (selectable with NC only)
⑧	Output type selection	
	0	4 - 20 mA with HART
	1	4 - 20 mA with HART + contact (3c)
	2	—

*1 Double range is not available when SIL is selected.
*2 HART communication is unavailable when double range (optional) is selected.



Example: Cable connectors

* Connectors must always be blanked off with blanking plugs (sold separately) when not in use.

RIKEN KEIKI Co., Ltd.

2-7-6 Azusawa, Itabashi-ku, Tokyo 174-8744, Japan
Phone : +81-3-3966-1113
Telefax : +81-3-3558-9110
E-mail : intdept@rikenkeiki.co.jp
Web site : https://www.rikenkeiki.co.jp/english

★ **Distributed by:**