



1. EU-TYPE EXAMINATION CERTIFICATE

2. Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU

3. EU-Type Examination Certificate No:

FM22ATEX0019X

4. Equipment or protective system:
(Type Reference and Name)

GD-3 and SD-3 Series Gas Detectors

5. Name of Applicant:

RIKEN KEIKI Co., Ltd.

6. Address of Applicant

2-7-6, Azusawa,
Itabashi-ku,
Tokyo, 174-8744, Japan

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8. FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

PR458413 dated 11th November 2022

9. Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN 45544 Part 1:2015, EN 45544 Part 3:2015, EN 50271:2018, EN 60079-29-1:2016+A1:2022+A11:2022,
EN IEC 62990-1:2022+A11:2022

10. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11. This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

Certificate issued by:

FM Approvals

15 April 2026

Certification Manager, FM Approvals Europe Ltd.

Date

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FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440
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F ATEX 020 (Jul/2024)



Page 1 of 6

SCHEDULE

EU-Type Examination Certificate No. FM22ATEX0019X

12. The marking of the equipment or protective system shall include:



EN 60079-29-1 (applies to models SD-3RI, SD-3DRI, SD-3NC, SD-3DNC, and SD-3SC with GD-3RI or GD-3NC remote detectors)

EN 45544-3 (applies to models SD-3EC, SD-3DEC, SD-3ECS, SD-3DECS, and SD-3SC with GD-3EC or GD-3ECS remote detectors)

EN/IEC 62990-1 SM (applies to models SD-3EC, SD-3DEC, SD-3ECS, SD-3DECS, and SD-3SC with GD-3EC or GD-3ECS remote detectors)

13. Description of Equipment or Protective System:

The SD-3 and GD-3 Series Gas Detectors are stand-alone transmitter and sensors designed for the detection of gas-in-air atmospheres. The SD-3 Series are the integral versions of the transmitter and sensor combination, with model number SD-3SC being the standalone transmitter. The GD-3 Series are the remote detectors with sensors.

Model Code Options:

SD-3ab Series Gas Detectors

a = D (Suction Type) or blank (Diffusion Type)

b = RI (Infra-red sensor), NC (Ceramic sensor), EC (Electrochemical sensor with metal and Teflon flame arrester), ECS (Electrochemical sensor with sintered metal flame arrester), or SC (Transmitter only)

GD-3ab Series Remote Gas Detectors

a = blank (Diffusion Type)

b = RI (Infra-red sensor), NC (Ceramic sensor), EC (Electrochemical sensor with metal and Teflon flame arrester), or ECS (Electrochemical sensor with sintered metal flame arrester)

a-b Gas Sensors

a = Sensor Type: IRF (Infra-red sensor), NCF (Ceramic sensor), or ESF (Electrochemical sensor)

b = Model Code: See Sensor Table

Sensor Table:

Model Number	Primary Gas	Secondary Gas	Range
IRF-1301	Methane (CH ₄)	Ethylene (C ₂ H ₄)	0-100 %LFL
		Butadiene (C ₄ H ₆)	
IRF-1303	Isobutane (i-C ₄ H ₁₀)	-	0-100 %LFL
IRF-1315	Propane (C ₃ H ₈)	Isobutane (i-C ₄ H ₁₀)	0-100 %vol (H-HH alarm type)
		Isobutylene (i-C ₄ H ₈)	
IRF-1317	Propane (C ₃ H ₈)	Isobutane (i-C ₄ H ₁₀)	0-100 %LFL
		Isobutylene (i-C ₄ H ₈)	

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SCHEDULE

EU-Type Examination Certificate No. FM22ATEX0019X

Model Number	Primary Gas	Secondary Gas	Range
IRF-1320	Isobutane (i-C ₄ H ₁₀)	-	0-100 %vol (H-HH alarm type)
IRF-1334	Methane (CH ₄)	-	0-100 %vol (H-HH alarm type)
IRF-1378	Propane (C ₃ H ₈)	Isobutane (i-C ₄ H ₁₀)	0-100 %vol (L-LL alarm type)
		Isobutylene (i-C ₄ H ₈)	
IRF-1383	Methane (CH ₄)	-	0-100 %vol (L-LL alarm type)
IRF-1388	Isobutane (i-C ₄ H ₁₀)	-	0-100 %vol (L-LL alarm type)
NCF-6318	Methane (CH ₄)	Ethylene (C ₂ H ₄)	0-100 %LFL
		Isobutane (i-C ₄ H ₁₀)	
		Hydrogen (H ₂)	
NCF-6318	Propane (C ₃ H ₈)	-	0-100 %LFL
NCF-6320	Hydrogen (H ₂)	-	0-100 %LFL
ESF-A24R	Hydrogen Sulfide (H ₂ S)	-	0-100 ppm
ESF-A24R3	Hydrogen Sulfide (H ₂ S)	-	0-100 ppm

Specifications - The manufacturer's specifications are as follows:

Sensor Type:	See Sensor Table
Gases:	See Sensor Table
Range:	See Sensor Table
Accuracy:	IRF and NCF sensors: ±5% F.S. ESF sensors: ±10% of reading
Response Time:	IRF and NCF sensors: t(90) ≤ 60 sec ESF sensors: t(90) ≤ 60 sec

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SCHEDULE

EU-Type Examination Certificate No. FM22ATEX0019X

Operating Temperature:	For Performance: -40°C to +70°C For Explosive Atmospheres: SD-3RI, SD-3DRI, SD-3SC with GD-3RI: T6; -50°C to +60°C T5; -50°C to +70°C SD-3NC, SD-3DNC, SD-3SC with GD-3NC: T5; -50°C to +44°C T4; -50°C to +70°C SD-3EC, SD-3DEC, SD-3ECS, SD-3DECS, SD-3SC with GD-3EC or GD-3ECS: T4; -50°C to +70°C
Storage Temperature:	IRF and NCF sensors: -20°C to +60°C ESF sensors: -40°C to +60°C
Relative Humidity:	IRF and NCF sensors: 0 to 95% RH ESF sensors: 5% to 95% RH
Supply Parameters:	18-30Vdc, 3.8W (RI), 4.5W (NC), 2.8W (EC, ECS), 5W (SD-3SC with GD-3RI, -NC, -EC, or -ECS)
Measurement Signal:	Display, 4-20mA, HART, Relay, RS-485
Alarms:	LED, 4-20mA, HART, Relay, RS-485
Ingress Protection: (Verified for performance)	ESF-A24R sensor: IP44 ESF-A24R3 sensor: IP66, IP67, with or without splash guard IRF sensors: IP44 NCF sensors: IP67, with or without splash guard
Firmware:	3.0

Accessories – The following accessories are included in the Approval:

4283 4008 50	Sensor Guard
4283 9011 00	Calibration Adapter (IRF sensor)
4283 9012 70	Calibration Adapter (NCF sensor)
4283 9013 40	Calibration Adapter (ESF sensor)
4283 9027 20	Suction Cap (ESF sensor)
4283 9028 00	Suction Cap (NCF sensor)
4283 9029 70	Suction Cap (IRF sensor)
4283 9077 80	Splash Guard (NCF sensor)

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SCHEDULE

EU-Type Examination Certificate No. FM22ATEX0019X

4283 9078 50

Splash Guard (ESF sensor)

14. Specific Conditions of Use:

1. The GD-3 Series remote gas detectors are only for use with the SD-3SC transmitter.
2. Refer to manual for ambient temperature.

15. Essential Health and Safety Requirements:

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

16. Test and Assessment Procedure and Conditions:

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

17. Schedule Drawings

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
23 November 2022	Original Issue.
18 July 2023	<u>Supplement 1:</u> Report Reference: PR466603 dated 18 th July 2023. Description of the Change(s): GD-3EC and SD-3EC Gas Detectors with Electrochemical Sensors have been added to certification. A separate model code listing and table have been created for showing all approved sensors, listing the gases and ranges for each.
23 January 2024	<u>Supplement 2:</u> Report Reference: PR467710 dated 22 nd January 2024. Description of the Change(s): Humidity range is extended for the ESF sensors. The ESF sensors are not applicable to the ATEX certification and the certificate is updated only because the product listing is uniform for all model codes.

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SCHEDULE

EU-Type Examination Certificate No. FM22ATEX0019X

Date	Description
20 June 2024	<u>Supplement 3:</u> Report Reference: PR463546 dated 19 th June 2024. Description of the Change(s): Additional gases added to performance certification. Firmware update. Added IRF-1378 100% vol Propane sensor. Updated format of certificate to specify primary gas and secondary gases of each sensor and to reduce paragraph format.
9 January 2025	<u>Supplement 4:</u> Report Reference: PR465714 dated 13 th December 2024. Description of the Change(s): H2 sensor NCF-6320 was added to the Sensor Table. The reference to the EU-Type certificate related to flameproof certification was updated. The marking for ambient temperature range was removed from the marking section of the certificate and a specific condition of use was added to refer the reader to the full list of ambient temperature ranges in the user manual. The EC and ECS electrochemical sensors (for toxic gases) were removed from the performance certificate. As this certificate only currently covers performance certification for flammable gas detectors, the toxic sensors have been removed. The flameproof rating for the toxic sensors is covered under the DEKRA EU-Type certificate.
18 February 2026	<u>Supplement 5:</u> Report Reference: PR461646 dated 17 th February 2026. Description of the Change(s): Toxic gas detection performance added for the H2S sensors. The equipment is now certified to the EN 45544-1 and 45544-3 standards, and the EN IEC 62990-1 standard, including environmental ratings with accessories.
15 April 2026	<u>Supplement 6:</u> Report Reference: PR472329 dated 13 April 2026. Description of the Change(s): Adding flammable sensors IRF-1303, IRF-1320, IRF-1334, IRF-1383, IRF-1388, and NCF-6318 (C ₃ H ₈ specification). The firmware is updated from revision 2.3 to 3.0. The specifications table regarding operating temperature is updated.

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Blueprint Report

Riken Keiki Co Ltd 249412

Class No. 6320

Original Project I.D. 458413

Certificate I.D. FM22ATEX0019X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
E3-2905-2272-00-01E	0	Terminal block PCB SD-3	PR458413
E3-2905-2289-00-01E	0	MAIN PCB(CPU) SD-3	PR458413
E3-2905-2289-00-02E	0	MAIN PCB(DISPLAY) SD-3	PR458413
E3-2905-2289-00-03E	0	MAIN PCB(POWER/OUTPUT) SD-3	PR458413
E3-2905-2289-00-04E	0	MAIN PCB(SIGNAL) SD-3	PR458413
E3-2905-2290-30-01E	0	Terminal block PCB Remote SD-3	PR458413
E3-2905-2296-70-01E	0	Remote PCB(POWER) SD-3	PR458413
E3-2905-2296-70-02E	0	Remote PCB(CPU/SENSOR) SD-3	PR458413
E3-6991-5969-10-01E	2	CIRCUIT DIAGRAM SD-3	PR458413
E3-6991-5969-10-02E	2	CIRCUIT DIAGRAM (Relay) SD-3	PR458413
E3-6991-5969-10-03E	3	CIRCUIT DIAGRAM (RS485) SD-3	PR458413
E3-6991-5969-10-04E	2	Internal Wiring SD-3	PR458413
E3-6991-5969-10-05E	2	Internal Wiring (Relay) SD-3	PR458413
E3-6991-5969-10-06E	3	Internal Wiring (RS485) SD-3	PR458413
E3-6991-5970-50-01E	2	CIRCUIT DIAGRAM SD-3SC + GD-3	PR458413
E3-6991-5970-50-02E	2	CIRCUIT DIAGRAM (Relay) SD-3SC + GD-3	PR458413
E3-6991-5970-50-03E	3	CIRCUIT DIAGRAM (RS485) SD-3SC + GD-3	PR458413
E3-6991-5970-50-04E	2	Internal Wiring SD-3SC + GD-3	PR458413
E3-6991-5970-50-05E	2	Internal Wiring (Relay) SD-3SC + GD-3	PR458413
E3-6991-5970-50-06E	3	Internal Wiring (RS485) SD-3SC + GD-3	PR458413
E3-6991-6154-40-01E	1	Primary circuit schematic SD-3 TERMINAL PCB	PR458413
E3-6991-6155-10-01K	1	Primary Components List SD-3 / SD-3SC	PR458413
E3-6991-6156-90-01K	0	PCB Layout SD-3	PR458413
E3-6991-6157-60-01K	0	PCB Layout SD-3SC	PR458413
E3-6991-6162-90-01E	1	Primary circuit schematic SD-3SC TERMINAL PCB	PR458413
E4-2905-2137-60-01E	0	Sensor PCB NCF	PR458413
E4-2905-2260-60-01E	0	Sensor PCB IRF	PR458413
E4-2905-2347-20-01E	1	Sensor Receiving PCB SD-3	PR461646
E4-2905-2348-00-01E	0	Socket PCB SD-3	PR458413
E4-2905-2431-30-01E	0	Sensor PCB ESF	PR466603
M3-4262-07-14K	3	REMOTE SENSOR HEAD GD-3	PR461646
M3-4262-07-15K	0	DETAILS OF REMOTE SENSOR HEAD A-A~B-B SECTION	PR458413
M3-4262-07-16K	0	DETAILS OF REMOTE SENSOR HEAD C-C~F-F SECTION	PR458413
M3-4262-07-18K	0	DETAILS OF REMOTE SENSOR HEAD (GD-3) C-C SECTION	PR458413
M3-4262-07-30K	7	LABEL (FOR ATEX/IECEx) REMOTE SENSOR HEAD (GD-3)	PR461646
M3-4262-07-33K	5	LABEL (FOR ATEX/IECEx) GD-3EC SERIES	PR461646
M3-4283-28-29K	6	GAS DETECTOR SD-3	PR461646
M3-4283-28-30K	1	EXTERNAL ENTRY (SD-3) B-B~G-G SECTION	PR458413
M3-4283-28-31K	0	DETAIL OF INTERNAL PART 1 A-A SECTION	PR458413
M3-4283-28-32K	1	COMPONENT	PR458413
M3-4283-28-35K	1	DETAILS OF SENSOR ASSEMBLY TYPE SINTERED METAL ELEMENT	PR466603
M3-4283-28-36K	0	DETAILS OF SENSOR ASSEMBLY TYPE PRESSED METAL WIRE ELEMENT	PR466603
M3-4283-28-37K	0	DETAILS OF SENSOR ASSEMBLY TYPE SOLID SENSOR	PR458413
M3-4283-28-38K	1	DETAILS OF SENSOR ASSEMBLY WITH SUCTION CHAMBER	PR466603
M3-4283-28-39K	0	SOCKET SD-3	PR458413
M3-4283-28-41K	0	MAIN P.C.B SD-3	PR458413
M3-4283-28-59K	7	LABEL (FOR ATEX/IECEx) SD-3	PR461646
M3-4283-28-64K	5	LABEL (FOR ATEX/IECEx) SD-3EC SERIES	PR461646
M4-4283-28-06K	0	DETAILS OF SENSOR ASSEMBLY PART 2 WITH SUCTION CHAMBER	PR458413
M4-4463-18-02K	0	SOLID SENSOR TYPE NCF	PR458413

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Certificate I.D. FM22ATEX0019X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
M4-4488-27-05K	0	ELECTROCHEMICAL SENSOR TYPE ESF	PR466603
M4-4631-01-03K	0	OPTICAL SENSOR TYPE IRF	PR458413
PLT-2905-2137-60	0	PARTS LIST OF NCF Sensor PCB	PR458413
PLT-2905-2260-60	0	PARTS LIST OF IRF Sensor PCB	PR458413
PLT-2905-2272-00	0	PARTS LIST OF Terminal block PCB SD-3	PR458413
PLT-2905-2289-00	0	PARTS LIST OF SD-3 Main PCB	PR458413
PLT-2905-2290-30	0	PARTS LIST OF Terminal block PCB Remote specifications SD-3	PR458413
PLT-2905-2296-70	0	PARTS LIST OF Remote PCB SD-3	PR458413
PLT-2905-2347-20	1	PARTS LIST OF Sensor receiving PCB SD-3	PR461646
PLT-2905-2348-00	0	PARTS LIST OF Socket PCB SD-3	PR458413
PLT-2905-2431-30	0	PARTS LIST OF ESF Sensor PCB (common parts)	PR466603
PLT-2905-2516-50	0	PARTS LIST OF ESF Sensor PCB (0mV_0.33kΩ)	PR466603
PT2E-287	10	SD-3 Series Technical Manual for FM Specifications	PR472329