BÜHLER TECHNOLOGIES

Gas Analysis

Flow Meter

SM-6, SM-6-V, S-SM 3-1

Installation and Operation Instructions

Original instructions

BE400001
10/2020

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Read this instruction carefully prior to installation and/or use. Pay attention particularly to all advises and safety instructions to prevent injuries. Bühler Technologies can not be held responsible for misusing the product or unreliable function due to unauthorised modifications.

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1 Introduction

1.1 Intended use

The flow meter can be used to display flow volumes of sample gasses or liquid mediums. Please refer to the nameplate to identify your model. In addition to the job number it also contains the item number and model designation. Any special features applicable to a flow meter model are described separately in the operating manual. When connecting, please note the specific values of the flow meter, and the correct version when ordering spare parts.

SM-6/SM-6-V series flow meters can also be equipped with a bistable limit switch. On the SM-6-V the flow volume can be adjusted with the needle valve.

On S-SM series safety flow meters the actual metering glass is protected by a second, thick-walled glass cylinder. If the metering glass bursts, the outer glass cylinder resumes protecting so medium cannot leak. A stainless steel tube further protects this outer glass cylinder from mechanical damage. Please refer to the data sheet for the various S-SM models.

NOTICE

When used in explosive areas

Model SM-6, SM6-V and S-SM 3-1 flow meters meet the fundamental safety requirements of Directive 2014/34/EU and are therefore suitable for use in Zone 1 Ex areas (**model S-SM 3-1: explosion group IIC; model SM-6, SM-6-V: explosion group IIB);** hazard notes must be observed). The flow meter can be used to transport non-flammable gases and flammable gases **explosion group IIB** (model SM-6 and SM-6-V) **or IIC** (model S-SM 3-1) which may occasionally be explosive during normal operation (**Zone 1**). The type plate on the flow meters has no Ex classification, as the mediums have no own ignition sources and therefore do not fall under Directive 2014/34/EU.

1.2 Contents

- 1 x Flow meter
- 1 x Product documentation
- 1 x Bracket (Model SM-6 / SM-6-V only)

1.3 Ordering instructions

The item number is a code for the configuration of your unit. Please use the following model key:

4056	X X	X	99	X	Measuring range*
	0 0				Air 6 - 60 Nl/h
	0 1				Air 10 - 100 Nl/h
	0 2				Air 25 - 250 Nl/h
	0 3				Air 50 - 500 Nl/h
	0 4				Air 80 - 800 Nl/h
	0 5				Water 0.5 - 5 L/h
	0 6				Water 1.2 - 12 L/h
	0 7				Water 2.5 - 25 L/h
	0 8				Water 4 - 40 L/h
	0 9				Water 6 - 60 L/h
	1 0				Special range
		0			without needle valve
		1			Valve PVDF / Viton
		2			Valve PCTFE / perfluorelastomer
				S	Limit switch with mounting bracket
				-	without limit switch

* Standard measuring tubes; air 20 °C 1.2 bar abs; water 20 °C

Ordering information for limit switch: A limit switch is factory installed if the last character of the item number is "S". Without the "S" marking the flow meter has no limit switch. We offer various switch amplifiers for controlling the limit switch (see data sheet no. 400003).

2 Safety instructions

2.1 Important advice

Operation of the device is only valid if:

- the product is used under the conditions described in the installation- and operation instruction, the intended application according to the type plate and the intended use. In case of unauthorized modifications done by the user Bühler Technologies GmbH can not be held responsible for any damage,
- when complying with the specifications and markings on the nameplates.
- the performance limits given in the datasheets and in the installation- and operation instruction are obeyed,
- monitoring devices and safety devices are installed properly,
- service and repair is carried out by Bühler Technologies GmbH,
- only original spare parts are used.

This manual is part of the equipment. The manufacturer keeps the right to modify specifications without advanced notice. Keep this manual for later use.

Signal words for warnings

DANGER	Signal word for an imminent danger with high risk, resulting in severe injuries or death if not avoided.
WARNING	Signal word for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
CAUTION	Signal word for a hazardous situation with low risk, resulting in damaged to the device or the property or minor or medium injuries if not avoided.
NOTICE	Signal word for important information to the product.

Warning signs

These instructions use the following warning signs:

	Warns of a general hazard		Wear respiratory equipment
	Warns not to inhale toxic gasses		Wear a safety mask
	Warns of corrosive liquids		Wear gloves
	Warns of explosive areas		

2.2 General hazard warnings

The equipment must be installed by a professional familiar with the safety requirements and risks.

Be sure to observe the safety regulations and generally applicable rules of technology relevant for the installation site. Prevent malfunctions and avoid personal injuries and property damage.

The operator of the system must ensure:

- Safety notices and operating instructions are available and observed,
- The respective national accident prevention regulations are observed,
- The permissible data and operational conditions are maintained,
- Safety guards are used and mandatory maintenance is performed,
- Legal regulations are observed during disposal,
- compliance with national installation regulations.

Maintenance, Repair

Please note during maintenance and repairs:

- Repairs to the unit must be performed by Bühler authorised personnel.
- Only perform conversion-, maintenance or installation work described in these operating and installation instructions.
- Always use genuine spare parts.
- Do not install damaged or defective spare part. If necessary, visually inspect prior to installation to determine any obvious damage to the spare parts.

Always observe the applicable safety and operating regulations in the respective country of use when performing any type of maintenance.

DANGER

Toxic, acidic gasses

Sample gas can be harmful.

a) Switch off the gas supply before performing maintenance and, if necessary, flush the gas lines with air.

b) If necessary, ensure a safe gas discharge.

c) Protect yourself from toxic / acidic gasses when performing maintenance. Wear appropriate protective equipment.

DANGER

Application in explosive atmosphere

Combustible gases and dust may inflame or explode. Avoid the following hazardous situations:

Electrostatic charge (spark formation)!

Clean plastic parts and labels with damp cloth only.

Connect metallic housings to ground!

Maximum surface temperature!

The maximum surface temperature T_{surf} of the equipment corresponds to the medium-temperature T_{med}; $T_{surf} \leq T_{med}$.

Ignition temperature!

Regard the ignition temperature of the explosive gas-atmosphere as well as maximum allowable surface temperatures (regard directive 94/9/ EC and harmonized standards).

Risk of breakage / emission of explosive or toxic gas possible.

Protect the equipment against being hit.

Gas leakage!

Life and explosion risk may result from gas leakage due to improper use or during maintenance.

3 Transport and storage

The product should only be transported inside the original packaging or a suitable alternative.

When not in use, the equipment must be protected from moisture and heat. They must be stored in a covered, dry and dust-free room at a temperature between -10 °C and 40 °C.

4 Installation and connection

The flow meters are equipped with the following threads:

Flow meter	Thread
SM-6 / SM-6-V	G 1/4
S-SM 3-1	NPT 1/4”

Please refer to chapter Dimensions [> page 16] for the assembly drawing. The fittings must be screwed in tight, sealed with Teflon tape or sealant/flat gasket!

4.1 Electrical connections (intrinsically safe)

WARNING

Hazardous electrical voltage

The device must be installed by trained staff only.

CAUTION

Wrong mains voltage

Wrong mains voltage may damage the device.
Regard the correct mains voltage as given on the type plate.

CAUTION

Explosion hazard due to prohibited electrical connection data

Prohibited electrical connection data can cause an explosive gas mixture to ignite.
In areas with explosive gas atmospheres, this device may only be operated with an intrinsically-safe power supply. The power supply must be suitable for the respective zone.
The limits specified in these operating instructions must be observed and must not be exceeded, even with two separate intrinsically-safe power supplies.
Ensure the limits will not be exceeded, even in the event of a fault, e.g. accidental series or parallel connection.
Please observe the relevant safety requirements, e.g. IEC/EN 60079-11 and IEC/EN 60079-14, when installing and operating intrinsically-safe equipment.

4.1.1 Installing the limit switch with bracket (only model SM-6/SM-6-V)

DANGER

Explosion hazard

Application in explosive atmosphere
Only use certificated flow sensors.

The limit switch is preinstalled.

- Prior to first use, loosen the plastic countersunk screws from the mounting plate and position the limit switch at the desired height.
- The Plastic countersunk screws must be fastened again.
- Connect the cable to the power supply.

Using the limit switch in Ex areas:

Please note the wiring parameters specified in the certificate PTB99ATEX2128X in chapter Attached documents [> page 19]. We recommend a variety of switch amplifiers, see chapter Technical Data [> page 15].

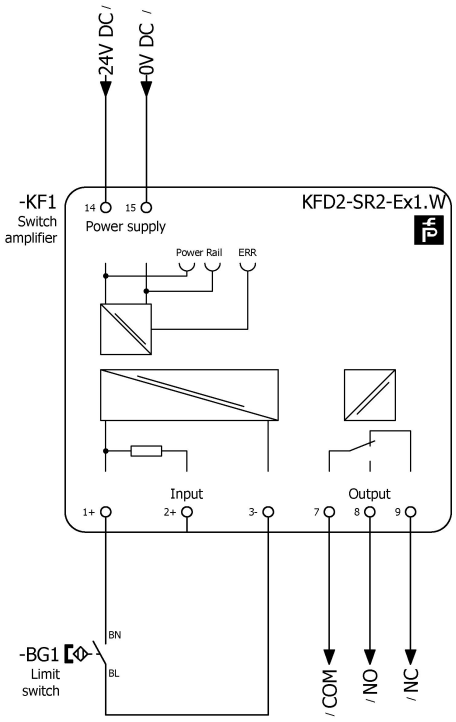
4.1.2 Installing and connecting the switch amplifier (only model SM-6/SM-6-V)

The switch amplifier is preinstalled.

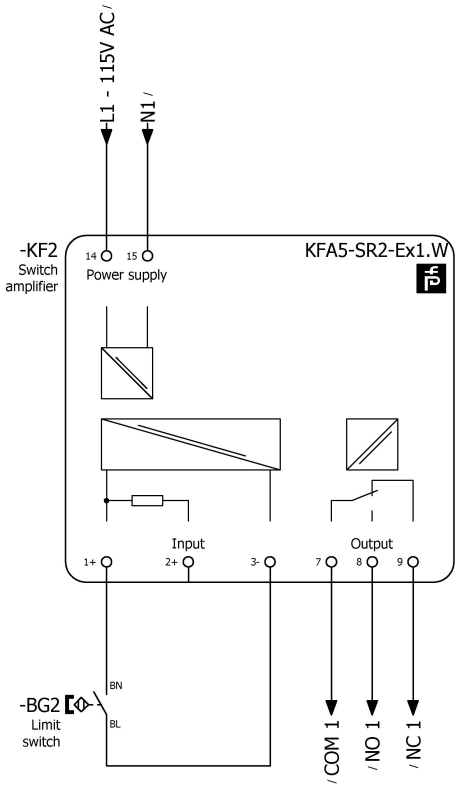
Please note the wiring parameters specified in the certificates PTB00ATEX2080 and PTB00ATEX2081 and the installation notes in the included operating manuals, chapter Attached documents [> page 19].

Wiring diagrams

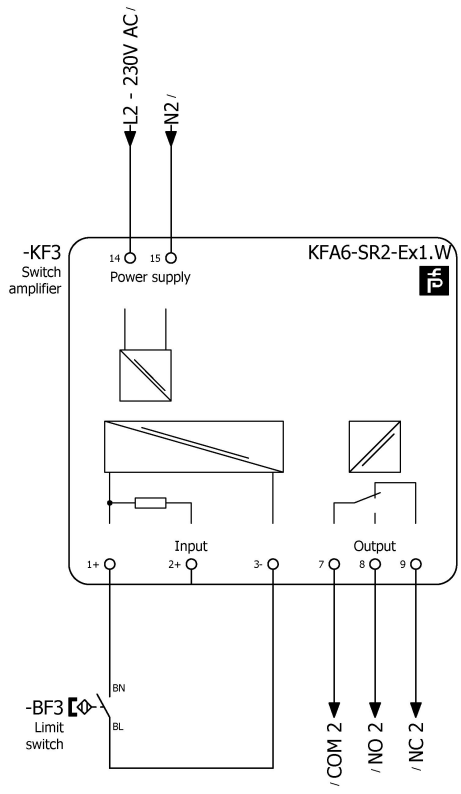
KFD2-SR2-Ex1.W



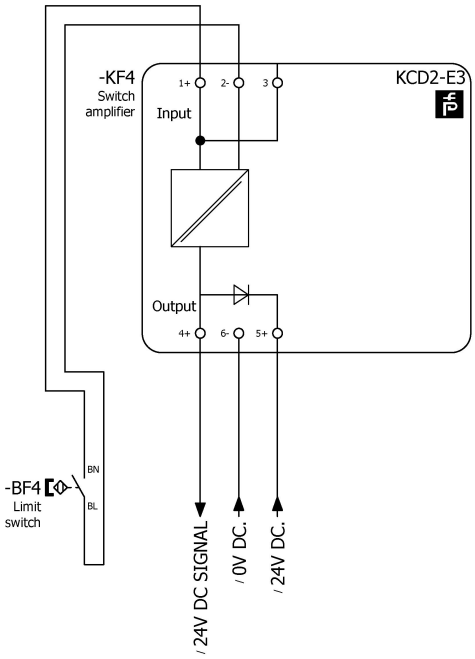
KFA5-SR2-Ex1.W



KFA6-SR2-Ex1.W



KCD2-E3



5 Operation and control

NOTICE

The device must not be operated beyond its specifications.

5.1 Read the flow value

The flow value can be read at the top of the float.

Please note: The values can only be correct, if the medium and pressure specified on the type plate match the sample.

5.2 Adjusting the needle valve

NOTICE! Please note: The needle valve is NOT a shut-off valve. Do not force the valve.

The valve is closed turning clockwise.

6 Maintenance

During maintenance, remember:

- The equipment must be maintained by a professional familiar with the safety requirements and risks.
- Only perform maintenance work described in these operating and installation instructions.
- When performing maintenance of any type, observe the respective safety and operation regulations.

DANGER

Explosion hazard

Gas leakage
If explosive, toxic or corrosive gas (liquid) will lead through the flow meter, check the leak tightness at regular intervals.

DANGER

Toxic, corrosive gasses

Sample gas can be harmful.

a) Switch off the process (depressurise) before starting maintenance. To do so, close the shut-off valve (if applicable).

b) Flush the flow meter with air before opening.

c) Protect yourself from toxic / corrosive gasses when performing maintenance. Wear appropriate protective equipment.

CAUTION

Gas leakage

Don't use damaged parts again.
Only use original spare parts.

6.1 Replacing the flow sensor with brackets (type SM-6 / SM-6-V only)

DANGER

Explosion hazard

Application in explosive atmosphere
Only use certificated flow sensors.

Remove the plastic countersunk screws (1) from the limit switch mounting plate (see Fig. 1). This will also loosen the clamping plate at the back of the flow meter.

Loosen both swivel nuts on the measuring tube. Slide the measuring tube into the upper end piece, applying light pressure. You can now swing out the measuring tube (see Fig. 2). Remove the gasket (2), die swivel nut (3) and limit switch (4) at the bottom end of the measuring tube. The measuring tube may be cleaned if necessary.

Measuring tubes with limit switch are assembled in the reverse order. Please be sure the chamfer on the gasket faces the respective end piece.

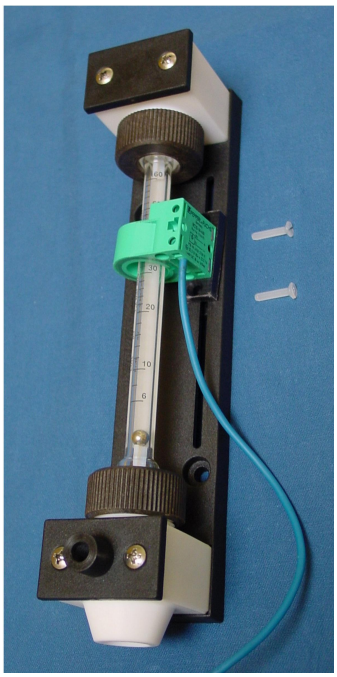


Fig. 1

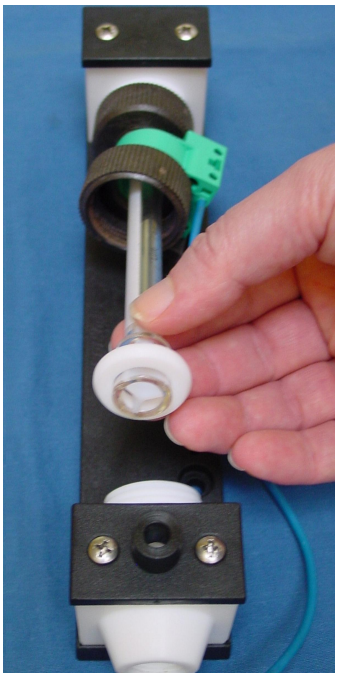


Fig. 2

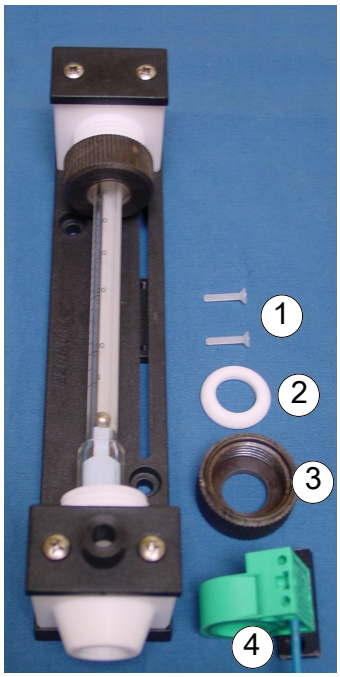


Fig. 3

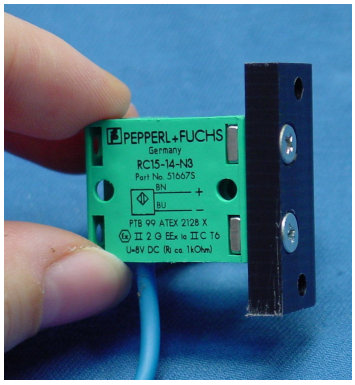


Fig. 4

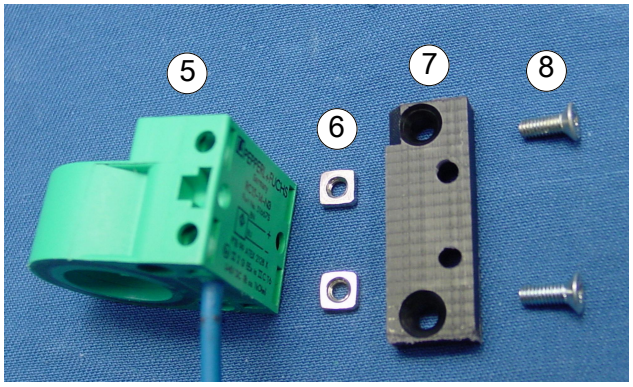


Fig. 5

1	Plastic countersunk screws	3	Swivel nut
2	Gasket	4	Limit switch with mounting plate
5	Limit switch	7	Machined mounting plate
6	M3 square nuts	8	Cross-head screws

Loosen both cross-head screws (8) on the mounting plate for the limit switch (see Fig. 4). Remove the mounting plate (7). Be careful not to lose the two square nuts (6) in the slots on the limit switch! Replace the limit switch (5) and fasten the mounting plate. The machined chamfer on the mounting plate (7) must face the top left.

You can now slide the limit switch onto the measuring tube again. When doing so, please note the direction of flow, i.e. the markings must be visible, the mounting plate for the limit switch must be positioned with the screw holes over the slot and the cable is fed out the bottom.

Finally, slide the swivel nut and the gasket (with the sealing cone toward the bracket) onto the measuring tube. Reinstall the measuring tube and tighten the swivel nut by hand.

Now insert the plastic countersunk screws through the slot in the base plate of the flow meter to fasten and adjust the mounting plate to the clamping plate inside the back of the base plate.

6.2 Replacing the metering tube (type SM-6 / SM-6V only)

6.2.1 Without flow sensor

Loosen the two swivel nuts for the measuring tube. Slide the metering tube into the upper end piece, applying light pressure. You can now move the gaskets under the swivel nuts onto the tapered end of the metering tube. You can now swing out the measuring tube.

You can now remove the swivel nuts and gaskets from the measuring tube and, if necessary, move them onto the new measuring tube. The metering tube is assembled in the reverse order. Please be sure the chamfer on the gasket faces the respective end piece.

6.2.2 With flow sensor

Loosen the top plastic countersunk screw (1) from the mounting plate for the limit switch (see Fig. I) and loosen the bottom plastic countersunk screw (1) so the limit switch can be moved. Removing it completely from the mounting plate is not required.

Loosen the two swivel nuts (3) for the measuring tube. Slide the metering tube into the upper end piece, applying light pressure. Turn the limit switch to the side (see Fig. 6) when pulling the metering tube out of the limit switch as well as the swivel nut. If necessary, move the limit switch in the process. Remove the gasket (2) and the swivel nut (3) at the bottom of the metering tube. Leave the limit switch on the mounting plate (see Fig. 7).

Assemble the measuring tube in the reverse order. Please be sure the chamfer on the gasket faces the respective end piece.

Fig. 6

Fig. 7

6.3 Replacing the metering tube - Safety flow meters S-SM

NOTICE! This procedure has to be carried out very carefully. You should only do it yourself, if you are sure, you are able to cope with it. We recommend sending the flow meter back to the manufacturer.

Screw one of the end pieces out of the flow meter while holding the flow meter in a direction preventing the metering tube from slipping out. The metering tube can now be taken out.

When mounting the new metering tube the metering and the protection glass has to fit correctly into the O-rings and end pieces.

7 Service and repair

This chapter contains information on troubleshooting and correction should an error occur during operation.

Repairs to the unit must be performed by Bühler authorised personnel.

Please contact our Service Department with any questions:

Tel.: +49-(0)2102-498955 or your agent

If the equipment is not functioning properly after correcting any malfunctions and switching on the power, it must be inspected by the manufacturer. Please send the equipment inside suitable packaging to:

Bühler Technologies GmbH

- Reparatur/Service -

Harkortstraße 29

40880 Ratingen

Germany

Please also attach the completed and signed RMA decontamination statement to the packaging. We will otherwise be unable to process your repair order.

You will find the form in the appendix of these instructions, or simply request it by e-mail:

service@buehler-technologies.com.

7.1 Troubleshooting

Problem / Failure	Possible cause	Solution
Float doesn't rise	– Needle valve closed	– Open needle valve
	– Pollution by liquid or particles	– Clean metering tube

Tab. 1: Troubleshooting

7.2 Spare parts and accessories

Please also specify the model and serial number when ordering parts.

Upgrade and expansion parts can be found in our catalog.

Available spare parts:

Item no.	Description
40 15 89 97	Gasket for Ø 10 mm tube diameter
40 55 05 0	Gasket for Ø 15 mm tube diameter

7.2.1 Spare parts and accessories - S-SM

Item no.	Description	
40 22 999	Flow Meter S-SM 3-1	End sections stainless steel 1.4571
40 23 999	Flow Meter S-SM 3-1	End sections titanium

7.2.2 Spare parts and accessories - switch amplifier

Item no.	Description
91 000 700 04	Switch amplifier, KFD2-SR2-Ex 1.W, 24 V DC
91 000 700 05	Switch amplifier, KFA5-SR2-Ex 1.W, 115 V AC
91 000 700 06	Switch amplifier, KFA6-SR2-Ex 1.W, 230 V AC
91 000 700 07	Switch amplifier, KCD2-E2L, 24 V DC
49 490 21	Limit switch with mounting bracket Ø10
49 490 19	Limit switch with mounting bracket Ø15

8 Disposal

The applicable national laws must be observed when disposing of the products. Disposal must not result in a danger to health and environment.

The crossed out wheelie bin symbol on Bühler Technologies GmbH electrical and electronic products indicates special disposal notices within the European Union (EU).

The crossed out wheelie bin symbol indicates the electric and electronic products bearing the symbol must be disposed of separate from household waste. They must be properly disposed of as waste electrical and electronic equipment.

Bühler Technologies GmbH will gladly dispose of your device bearing this mark. Please send your device to the address below for this purpose.

We are obligated by law to protect our employees from hazards posed by contaminated devices. Therefore please understand that we can only dispose of your waste equipment if the device is free from any aggressive, corrosive or other operating fluids dangerous to health or environment. **Please complete the "RMA Form and Decontamination Statement", available on our website, for every waste electrical and electronic equipment. The form must be applied to the packaging so it is visible from the outside.**

Please return waste electrical and electronic equipment to the following address:

Bühler Technologies GmbH
WEEE
Harkortstr. 29
40880 Ratingen
Germany

Please also observe data protection regulations and remember you are personally responsible for the returned waste equipment not bearing any personal data. Therefore please be sure to delete your personal data before returning your waste equipment.

9 Appendices

9.1 Technical Data

Flow meter	SM-6	SM-6-V
Ambient temperature:	-20 °C to +80 °C *	-20 °C to +80 °C *
Medium temperature:	≤ 150 °C, for special ranges max. 80 °C	≤ 130 °C, for special ranges max. 80 °C
Max. operating pressure	4 bar	4 bar
Mechanical load	Tested based on DNV-GL CG0339 vibration class A (0.7g) 2 Hz-13.2 Hz Amplitude ± 1.0 mm 13.2 Hz -100 Hz 0.7g acceleration	Tested based on DNV-GL CG0339 vibration class A (0.7g) 2 Hz-13.2 Hz Amplitude ± 1.0 mm 13.2 Hz -100 Hz 0.7g acceleration
Material		
Heads:	PTFE	PTFE
Seal:	PTFE	PTFE
Adjusting spindle:	-	PVDF / Viton or PCTFE / perfluoroelastomer
Measuring tube:	Borosilicate glass	Borosilicate glass
Float:	Hastelloy C 4	Hastelloy C 4
Swivel nut:	PPS fibreglass reinforced	PPS fibreglass reinforced
Base plate:	PA	PA

* Please note the ambient temperature for the configuration with limit switch!

Limit switch	Ø10	Ø15
Protection class:	IP 67	IP 67
Ambient temperature:	-20 °C to +100 °C	-20 °C to +70 °C
Housing material:	PBT	PBT
Operation:	bi-stable	bi-stable
Cord length:	2 m	2 m
Approval:	PTB 99 ATEX 2128X Ⓔx II 2 G Ex ia II C T6...T1 Gb	PTB 99 ATEX 2128X Ⓔx II 2 G Ex ia II C T6...T1 Gb

Safety Flow Meter S-SM 3-1	
Ambient temperature:	-20 °C to 80 °C *
Operating pressure:	10 bar (at max. 20 °C) **
Operating temperature:	100 °C (at max. 2 bar) **
Measuring range:	see table
Weight:	0.9 kg
Float:	glass, Hastelloy, stainless steel or PTFE
End sections:	PTFE, stainless steel or titanium
Mounting:	via included pipe clamps

* specify in order, select mounting.

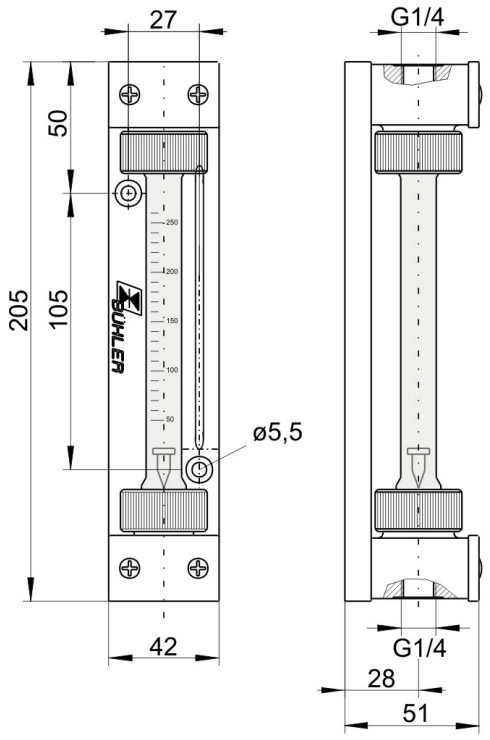
** Max. operating pressure [bar] = $10 - \frac{\text{Max. operating temperature [°C]} - 20}{10}$

Switch amplifier	KFD2-SR2-Ex 1.W	KFA5-SR2-Ex 1.W	KFA6-SR2-Ex 1.W	KCD2-E2L
Supply voltage:	20 - 30 V DC	103.5 - 126 V AC 45 - 65 Hz	207 - 253 V AC 45 - 65 Hz	10 - 30 V DC
Inherently safe per:	EN 60079-11	EN 60079-11	EN 60079-11	no
Line monitor:	yes	yes	yes	yes
Approvals: *(FM, UL, CSA, IECEx in accordance with the operating instructions)*	**PTB 00 ATEX 2080** ⟨Ex⟩ II(1)G [Ex ia Ga] IIC	**PTB 00 ATEX 2081** ⟨Ex⟩ II(1)G [Ex ia Ga] IIC	**PTB 00 ATEX 2081** ⟨Ex⟩ II(1)G [Ex ia Ga] IIC	
Output (not inherently safe):	Change-over contact	Change-over contact	Change-over contact	NO contact PNP transistor
Switching current output:	230 V AC, 2 A cos φ > 0.7 40 V DC, 2 A ohmic load	230 V AC, 2 A cos φ > 0.7 40 V DC, 2 A ohmic load	230 V AC, 2 A cos φ > 0.7 40 V DC, 2 A ohmic load	200 mA DC
Ambient temperature:	-20 °C ...+60 °C	-20 °C ...+60 °C	-20 °C ...+60 °C	-25 °C ...+70 °C
Protection class:	IP 20	IP 20	IP 20	IP 20
Dimensions:	20x119x115 mm (WxHxD)	20x119x115 mm (WxHxD)	20x119x115 mm (WxHxD)	20x63x44 mm (WxHxD)

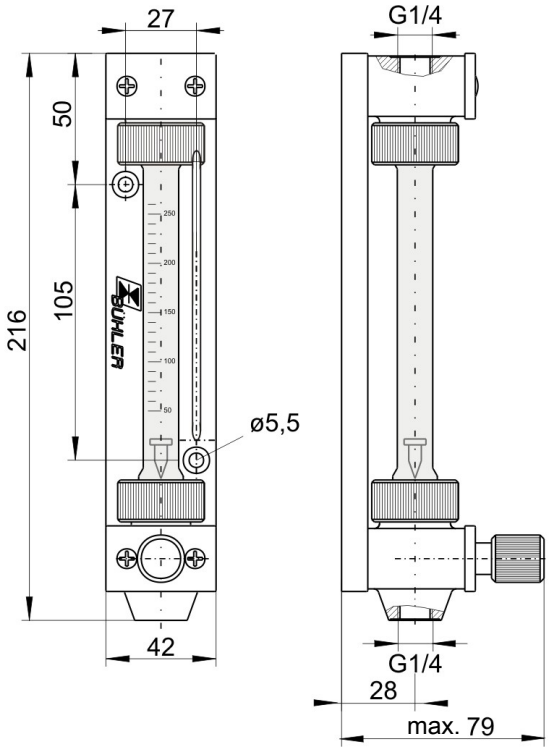
9.2 Dimensions

SM6 / SM6-V flow meter:

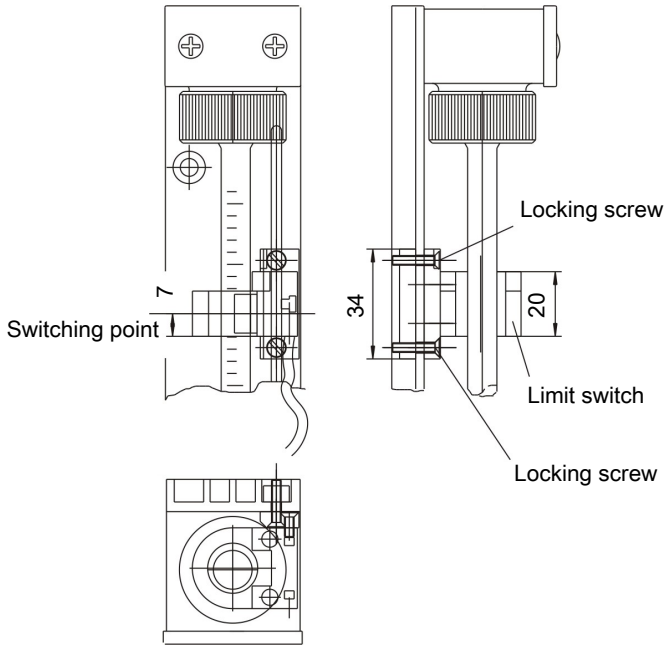
SM-6



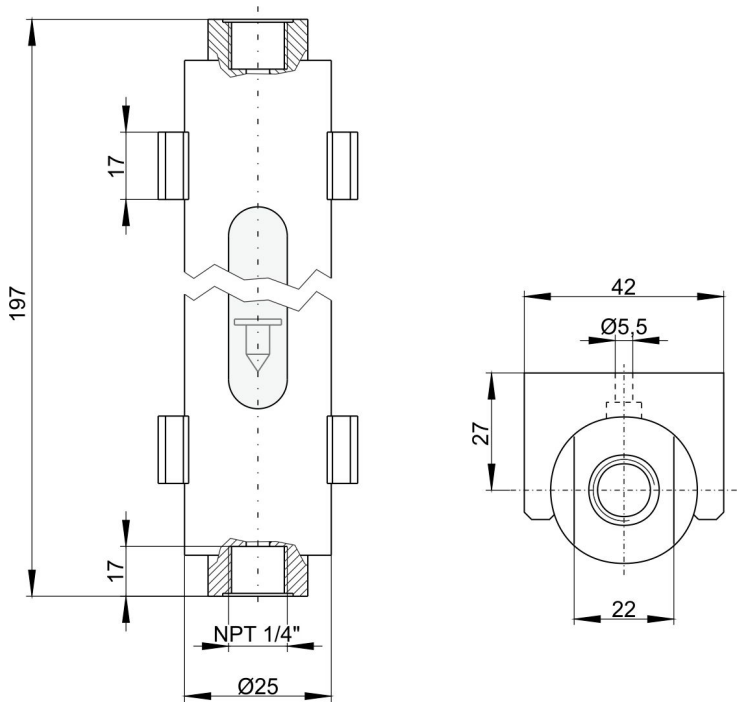
SM-6-V



Limit switch:



S-SM safety flow meter:



9.3 Measuring ranges

	SM-6 flow meter	
Medium:	Air	Water
Pressure:	+ 1.2 bar abs.	
Temperature:	+ 20 °C	+ 20 °C
	6 ... 60 Nl/h	0.5 ... 5 L/h
	10 ... 100 Nl/h	1.2 ... 12 L/h
	25 ... 250 Nl/h	2.5 ... 25 L/h
	50 ... 500 Nl/h	4 ... 40 L/h
	80 ... 800 Nl/h	6 ... 60 L/h

	Flow Meter S-SM 3-1	
Medium:	Air	Water
Pressure:	+ 1.2 bar abs.	
Temperature:	+ 20 °C	+ 20 °C
	1.6 – 16 Nl/h	0.25 - 2.5 l/h
	4 – 40 Nl/h	0.5 - 5 l/h
	6 - 60 Nl/h	1.2 - 12 l/h
	10 – 100 Nl/h	2.5 - 25 l/h
	25 – 250 Nl/h	4 - 40 l/h
	50 – 500 Nl/h	6 - 60 l/h
	80 – 800 Nl/h	10 - 100 l/h

10 Attached documents

- Manufacturer Declaration HX400001
- Operating Instructions KFA5/6-SR2-Ex1.W
- Operating instructions KFD2-SR2-Ex1.W
- Type examination certificate RC15-14-N3 (PTB99ATEX2128X)
- Type examination certificate KFD2-SR2-Ex1.W (PTB00ATEX2080)
- Type examination certificate KFA5/6-SR2-Ex1.W (PTB00ATEX2081)
- RMA - Decontamination Statement

Herstellererklärung
Manufacturer Declaration

Hiermit erklärt Bühler Technologies GmbH, dass die nachfolgenden Produkte keine „Geräte" im Sinne der Richtlinie **2014/34/EU (Atex)** sind und somit nicht mit einem CE-Zeichen versehen sind.

*Herewith Bühler Technologies GmbH declares that the following products are not „equipment" for the purpose of Directive **2014/34/EU (Atex)**, respectively, and therefore are not labeled with the CE mark.*

Produkt / products: Strömungsmesser / *Flow meter*
Typ / type: SM-6, SM-6-V, S-SM 3-1

Die oben erwähnten Produkte besitzen keine eigenen Zündquellen, solange für Einbau, Montage, Betrieb, Wartung und Reinigung sämtliche Sicherheitsbestimmungen der Technischen Dokumentation und die einschlägigen Sicherheitsvorschriften (z.B. EN 60079-0, EN 60079-14, etc.) eingehalten werden. Beachten sie auch die Hinweise in den zugehörigen Datenblättern.
The products specified above have no own ignition sources, provided all safety regulations in the technical documentation and the relevant safety instructions (e.g. EN 60079-0, EN 60079-14, etc.) are observed during installation, assembly, operation, maintenance and cleaning. Note also the indications in the associated datasheets.

Alle Typen können zur Anzeige der Durchflussmenge von Gasen oder flüssigen Medien verwendet werden. Durch die Strömungsmesser können nichtbrennbare Gase und brennbare Gase, die im Normalbetrieb gelegentlich explosiv sein können, geleitet werden (Zone 1, Explosionsgruppe IIC (Typ S-SM 3-1) oder Explosionsgruppe IIB (Typ SM-6, SM-6-V)). Die Strömungsmesser dürfen nur durch Fachpersonal installiert werden; die einschlägigen Sicherheitsvorschriften sind zwingend zu beachten. Beachten sie auch die Hinweise in der zugehörigen Bedienungsanleitung. Die Produkte sind für den Einsatz in explosionsgefährdeten Bereichen der Zone 1, Explosionsgruppe IIC (Typ S-SM-3-1) bzw. Explosionsgruppe IIB (Typen SM-6, SM-6-V), geeignet.

All flow meter types can be used to display flow rates of gases or liquids. Inflammable gases and flammable gases, only temporary explosive in normal operation, can led through the flow meters (zone 1, explosion group IIC (type S-SM 3-1) or explosion group IIB (types SM-6, SM-6-V)). The flow meters have to be installed by trained personnel. All safety regulations have to be fulfilled. The flow meter can be used in zone 1, explosions group IIC (type S-SM-3-1) or explosion group IIB (types SM-6, SM-6-V). *Note also the indications in the Installation- and Operation Instruction.*

Das oben beschriebene Produkt der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union:
The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EN ISO 80079-36:2016 **EN ISO 80079-37:2016**

Zusätzlich wurden folgende nationale Normen, Richtlinien oder Spezifikationen berücksichtigt:
In addition, the following national standards, guidelines or specifications have been used:

TRGS 727

Die alleinige Verantwortung für die Ausstellung dieser Herstellererklärung trägt der Hersteller.
This declaration of manufacture is issued under the sole responsibility of the manufacturer.
Dokumentationsverantwortlicher für diese Herstellererklärung ist Herr Stefan Eschweiler mit Anschrift am Firmensitz.
The person authorised to compile the technical file is Mr. Stefan Eschweiler located at the company's address.

Ratingen, den 07.01.2020

Stefan Eschweiler
Geschäftsführer – *Managing Director*

Frank Pospiech
Geschäftsführer – *Managing Director*

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen,
Tel. +49 (0) 21 02 / 49 89-0, Fax. +49 (0) 21 02 / 49 89-20
Internet: www.buehler-technologies.com

Manufacturer Declaration

Herewith Bühler Technologies GmbH declares that the following products are not „equipment" for the purpose of legislation **Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016** respectively, and therefore are not labelled with the UKCA mark.

Product: Flow meter
Types: SM-6
SM-6-V
S-SM 3-1

This declaration is valid for all devices manufactured in accordance with the manufacturing documents deposited with the manufacturer – which form an integral part of this declaration.

The products specified above have no own ignition sources, provided all safety regulations in the technical documentation and the relevant safety instructions (e.g. EN 60079-0, EN 60079-14, etc.) are observed during installation, assembly, operation, maintenance and cleaning. Note also the indications in the associated datasheets.
All flow meter types can be used to display flow rates of gases or liquids. Inflammable gases and flammable gases, only temporary explosive in normal operation, can led through the flow meters (zone 1, explosion group IIC (type S-SM 3-1) or explosion group IIB (types SM-6, SM-6-V)). The flow meters have to be installed by trained personnel. All safety regulations have to be fulfilled. The flow meter can be used in zone 1, explosions group IIC (type S-SM-3-1) or explosion group IIB (types SM-6, SM-6-V). Note also the indications in the Installation- and Operation Instruction.

The object of the declaration described above is in conformity with the relevant designated standards:

EN ISO 80079-36:2016

EN ISO 80079-37:2016

In addition, the following standards have been used:

TRGS 727

This declaration of manufacture is issued under the sole responsibility of the manufacturer.

Ratingen in Germany, 01.11.2022

Stefan Eschweiler
Managing Director

Frank Pospiech
Managing Director

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen,
Tel. +49 (0) 21 02 / 49 89-0, Fax. +49 (0) 21 02 / 49 89-20
Internet: www.buehler-technologies.com

Instruction Manual

Marking

K-System, Isolated barriers
Device identification
Model number
ATEX approval
Group, category, type of protection, temperature classification

table 1

The exact designation of the device can be found on the name plate on the device side.

Pepperl+Fuchs GmbH Lilienthalstrasse 200, 68307 Mannheim, Germany

table 2

Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.
Mounting, installation, commissioning, operation, maintenance and dismounting of the device may only be carried out by appropriate trained and qualified personnel. The instruction manual must be read and understood.
Prior to using the device you should make yourself familiar with the device and carefully read the instruction manual.

Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location.
The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable supplement this document. You can find this information under www.pepperl-fuchs.com.

Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.
The device is used in control and instrumentation technology (C&I technology) for the galvanic isolation of signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals.
The device has intrinsically safe circuits that are used for operating intrinsically safe field devices in hazardous areas.
Use the device only within the specified ambient conditions.
The device is designed for mounting on a 35 mm DIN mounting rail according to EN 60715.
Only use the device stationary.
The device is an associated apparatus according to IEC/EN 60079-11.

Improper Use

Protection of the personnel and the plant is not ensured if the device is not being used according to its intended use.
The device is not suitable for isolating signals in power installations unless this is noted separately in the corresponding datasheet.

Mounting and Installation

Do not mount a damaged or polluted device.
Mount the device in a way that the device is protected against mechanical hazard. Mount the device in a surrounding enclosure for example.
The device must be installed outside of the hazardous area.
The device fulfills a degree of protection IP20 according to IEC/EN 60529.
The device must be installed and operated only in an environment that ensures a pollution degree 2 (or better) according to IEC/EN 60664-1.
If used in areas with higher pollution degree, the device needs to be protected accordingly.
All circuits connected to the device must comply with the overvoltage category II (or better) according to IEC/EN 60664-1.
Only use power supplies that provide protection against electric shock (e. g. SELV or PELV) for the connection to power feed modules.
Observe the installation instructions according to IEC/EN 60079-14.

Requirements for Cables and Connection Lines

Observe the following points when installing cables and connection lines:
Observe the permissible core cross-section of the conductor.
If you use stranded conductors, crimp wire end ferrules on the conductor ends.
Use only one conductor per terminal.
When installing the conductors the insulation must reach up to the terminal.
Observe the tightening torque of the terminal screws.
If the rated voltage is greater than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

Requirements for Usage as Associated Apparatus

If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i.
Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14.
Observe the compliance of the separation distances between two adjacent intrinsically safe circuits according to IEC/EN 60079-14.
Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.
When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.
If no L_o and C_o values are specified for the simultaneous appearance of lumped inductances and capacitances, the following rule applies.

- The specified value for L_o and C_o is used if one of the following conditions applies:
  - The circuit has distributed inductances and capacitances only, e. g., in cables and connection lines.
  - The total value of L_i (excluding cable) of the circuit is < 1 % of the specified L_o value.
  - The total value of C_i (excluding cable) of the circuit is < 1 % of the specified C_o value.
- A maximum of 50 % of the specified value for L_o and C_o is used if the following condition applies:
  The total value of L_i (excluding cable) of the circuit is ≥ 1 % of the specified L_o value.
  The total value of C_i (excluding cable) of the circuit is ≥ 1 % of the specified C_o value.
  The reduced capacitance for gas groups I, IIA and IIB must not exceed the value of 1 µF (including cable).
  The reduced capacitance for gas group IIC must not exceed the value of 600 nF (including cable).

If more channels of one device are connected in parallel, ensure the parallel connection is made directly at the terminals of the device. When verifying the intrinsic safety, observe the maximum values for the parallel connection.

Operation, Maintenance, Repair

The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.
If the rated voltage is greater than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

Delivery, Transport, Disposal

Check the packaging and contents for damage.
Check if you have received every item and if the items received are the ones you ordered.
Always store and transport the device in the original packaging.
Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered.
Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.

Instruction Manual

Marking

K-System, Isolated barriers for Zone 2
Device identification
Model number
ATEX approval
Group, category, type of protection, temperature classification

table 1

The exact designation of the device can be found on the name plate on the device side.

Pepperl+Fuchs GmbH Lilienthalstrasse 200, 68307 Mannheim, Germany

table 2

Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.
Mounting, installation, commissioning, operation, maintenance and dismounting of the device may only be carried out by appropriate trained and qualified personnel. The instruction manual must be read and understood.
Prior to using the device you should make yourself familiar with the device and carefully read the instruction manual.

Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location.
The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable supplement this document. You can find this information under www.pepperl-fuchs.com.

Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.
The device is used in control and instrumentation technology (C&I technology) for the galvanic isolation of signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals.
The device has intrinsically safe circuits that are used for operating intrinsically safe field devices in hazardous areas.
Use the device only within the specified ambient conditions.
The device is designed for mounting on a 35 mm DIN mounting rail according to EN 60715.
Only use the device stationary.
The device is an associated apparatus according to IEC/EN 60079-11.
The device is an electrical apparatus for hazardous areas of Zone 2.

Improper Use

Protection of the personnel and the plant is not ensured if the device is not being used according to its intended use.
The device is not suitable for isolating signals in power installations unless this is noted separately in the corresponding datasheet.

Mounting and Installation

Do not mount a damaged or polluted device.
Mount the device in a way that the device is protected against mechanical hazard. Mount the device in a surrounding enclosure for example.
Do not mount the device in the dust hazardous area.
The device fulfills a degree of protection IP20 according to IEC/EN 60529.
The device must be installed and operated only in an environment that ensures a pollution degree 2 (or better) according to IEC/EN 60664-1.
If used in areas with higher pollution degree, the device needs to be protected accordingly.
All circuits connected to the device must comply with the overvoltage category II (or better) according to IEC/EN 60664-1.
Only use power supplies that provide protection against electric shock (e. g. SELV or PELV) for the connection to power feed modules.
Observe the installation instructions according to IEC/EN 60079-14.

Requirements for Cables and Connection Lines

Observe the following points when installing cables and connection lines:
Observe the permissible core cross-section of the conductor.
If you use stranded conductors, crimp wire end ferrules on the conductor ends.
Use only one conductor per terminal.
When installing the conductors the insulation must reach up to the terminal.
Observe the tightening torque of the terminal screws.
If the rated voltage is greater than 50 V AC, proceed as follows:
1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

Requirements for Usage as Associated Apparatus

If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i.
Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14.
Observe the compliance of the separation distances between two adjacent intrinsically safe circuits according to IEC/EN 60079-14.
Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.
When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.
If no L_o and C_o values are specified for the simultaneous appearance of lumped inductances and capacitances, the following rule applies.

- The specified value for L_o and C_o is used if one of the following conditions applies:
  - The circuit has distributed inductances and capacitances only, e. g., in cables and connection lines.
  - The total value of L_i (excluding cable) of the circuit is < 1 % of the specified L_o value.
  - The total value of C_i (excluding cable) of the circuit is < 1 % of the specified C_o value.
- A maximum of 50 % of the specified value for L_o and C_o is used if the following condition applies:
  The total value of L_i (excluding cable) of the circuit is ≥ 1 % of the specified L_o value.
  The total value of C_i (excluding cable) of the circuit is ≥ 1 % of the specified C_o value.
  The reduced capacitance for gas groups I, IIA and IIB must not exceed the value of 1 µF (including cable).
  The reduced capacitance for gas group IIC must not exceed the value of 600 nF (including cable).

If more channels of one device are connected in parallel, ensure the parallel connection is made directly at the terminals of the device. When verifying the intrinsic safety, observe the maximum values for the parallel connection.

Requirements for Equipment Protection Level Gc

The device must be installed and operated only in surrounding enclosures that

- comply with the requirements for surrounding enclosures according to IEC/EN 60079-0,
- are rated with the degree of protection IP54 according to IEC/EN 60529.

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.
Provide a transient protection. Ensure that the peak value of the transient protection does not exceed 140 % of the rated voltage.
Place warning label "Warning – Do not remove or replace fuse when energized!" visibly on the housing.

Operation, Maintenance, Repair

The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.
If the rated voltage is greater than 50 V AC, proceed as follows:
1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

Requirements for Equipment Protection Level Gc

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.
Only use operating elements in the absence of a potentially explosive atmosphere.
Only use the programming socket in the absence of a potentially explosive atmosphere.
Only change the replaceable fuse, when the device is de-energized.

Delivery, Transport, Disposal

Check the packaging and contents for damage.
Check if you have received every item and if the items received are the ones you ordered.
Always store and transport the device in the original packaging.
Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered.
Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 99 ATEX 2128 X

(4) Equipment: Ring initiator types RJ..., RC... and TG...

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: D-68307 Mannheim

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 99-29058.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997 **EN 50020:1994**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

Ex II 2 G EEx ia IIC T6

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, August 10, 1999

In the absence of Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2128 X

(15) Description of equipment

The ring initiators of types RJ..., RC... and TG... are used to convert displacements into electrical signals.

The ring initiators may be operated with intrinsically safe circuits certified for categories and explosion groups [EEx ia] IIC or IIB resp. [EEx ib] IIC or IIB. The category as well as the explosion group of the intrinsically safe ring initiators depends on the connected supplying intrinsically safe circuit.

Electrical data

Evaluation and
supply circuit..... type of protection Intrinsic Safety EEx ia IIC/IIB
..... resp. EEx ib IIC/IIB
only for connection to certified intrinsically safe circuits
Maximum values:

type 1	type 2	type 3
U_i = 16 V	U_i = 16 V	U_i = 16 V
I_i = 25 mA	I_i = 25 mA	I_i = 52 mA
P_i = 34 mW	P_i = 64 mW	P_i = 169 mW

The assignment of the type of the connected circuit to the maximum permissible ambient temperature and the temperature class as well as the effective internal reactances for the individual types of ring intiators are shown in the table:

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2128 X

types	L_i	C_i	type 1			type 2			type 3		
			maximum permissible ambient temperature in °C for application in temperature class								
	[µH]	[nF]	T6	T5	T4-T1	T6	T5	T4-T1	T6	T5	T4-T1
RJ10-N...	20	30	75	90	100	70	85	100	55	70	90
RJ10-...-N...	20	30	75	90	100	70	85	100	55	70	90
RJ10-Bi...	20	90	75	90	100	70	85	100	55	70	90
RJ10-...-Bi...	20	90	75	90	100	70	85	100	55	70	90
RC10-...-N0...	100	150	75	90	100	70	85	100	55	70	90
RC10-...-N3...	120	90	75	90	100	70	85	100	55	70	90
TG10	20	30	75	90	100	70	85	100	55	70	90
TG10-1	100	150	75	90	100	70	85	100	55	70	90
TG10-bi	20	90	75	90	100	70	85	100	55	70	90
TG10-1bi	120	90	75	90	100	70	85	100	55	70	90
RJ15-N...	20	130	75	90	100	70	85	100	55	70	90
RJ15-...-N...	20	130	75	90	100	70	85	100	55	70	90
RJ15-Bi...	50	90	75	90	100	70	85	100	55	70	90
RJ15-...-Bi...	50	90	75	90	100	70	85	100	55	70	90
RC15-...-N0...	100	150	75	90	100	70	85	100	55	70	90
RC15-...-N3...	70	90	75	90	100	70	85	100	55	70	90
TG15	20	130	75	90	100	70	85	100	55	70	90
TG15-1	100	150	75	90	100	70	85	100	55	70	90
TG15-bi	50	90	75	90	100	70	85	100	55	70	90
TG15-1bi	70	90	75	90	100	70	85	100	55	70	90
RJ21-N...	25	30	75	90	100	70	85	100	55	70	90
RJ21-Bi...	50	70	75	90	100	70	85	100	55	70	90
RJ43-N...	50	40	75	90	100	70	85	100	55	70	90

(16) Test report PTB Ex 99-29058

(17) Special conditions for safe use

1. For the application within a temperature range of -60°C to -20 °C the ring initiators of types RJ..., RC... and TG... must be protected against damage due to impact by mounting into an additional housing.
2. The connection facilities of the ring initiators of types RJ..., RC... and TG... shall be installed as such that at least a degree of protection of IP20 according to IEC-publication 60529:1989 is met.

3. The assignment of the type of the connected circuit to the maximum permissible ambient temperature and the temperature class as well as the effective internal reactances for the individual types of ring initiators is shown in the table given under item (15) of this EC-type-examination certificate..
4. Inadmissible electrostatic charge of the plastic housing of the ring initiators of types RJ43-...-N..., RJ21-...-N... and RJ21-...-Bi... has to be avoided. A warning label on the device shall point to this danger.

(18) Essential health and safety requirements

Met by the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, August 10, 1999

In the absence of Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 2128 X

(Translation)

Equipment: Ring initiator, types RJ..., RC... and TG...

Marking: Ⓔx **II 2 G EEx ia IIC T6**

Manufacturer: Pepperl+Fuchs GmbH

Address: Lilienthalstraße 200, 68307 Mannheim, Germany

Description of supplements and modifications

The modifications concern the consideration of the current state of the applied standards and – resulting from this – the marking of the ring initiators, types RJ..., RC... and TG..., the way how to affix the marking on the equipment as well as the internal construction (inclusion of further alternative casting resin materials, wrapping PCB´s with PTFE-tape). The "Electrical Data", the "Special Conditions" as well as all other specifications apply without changes.

In the future the marking will read:

Ⓔx **II 2 G Ex ia IIC T6...T1 Gb**

Applied standards

EN 60079-0:2012, EN 60079-11:2012

Test report: PTB Ex 15-24246

ZSEx10101e b

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, April 28, 2015

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Sheet 1/1

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) # EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 94/9/EG**

(3) EG-Baumusterprüfbescheinigungsnummer

PTB 00 ATEX 2080

(4) Gerät: Trennschaltverstärker Typ K*D*-SR*-Ex*.W.*

(5) Hersteller: Pepperl + Fuchs GmbH

(6) Anschrift: Königsberger Allee 87, D-68307 Mannheim

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Physikalisch-Technische Bundesanstalt bescheinigt als benannte Stelle Nr. 0102 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht PTB Ex 00-20205 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 50014:1997 **EN 50020:1994**

(10) Falls das Zeichen „X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Bau des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes.

(12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:

II (1) G D [EEx ia] IIC

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Braunschweig, 20. Juli 2000

Dr.-Ing. U. Johannsmeyer, z.Z. abwesend
Regierungsdirektor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

(13) # Anlage

(14) ## EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

(15) Beschreibung des Gerätes

Der Trennschaltverstärker Typ K*D*-SR*-Ex*.W.*dient zur Übertragung von Steuerbefehlen aus dem explosionsgefährdeten Bereich in den nichtexplosionsgefährdeten Bereich sowie zur sicheren galvanischen Trennung von eigensicheren und nichteigensicheren Stromkreisen.

Die höchstzulässige Umgebungstemperatur beträgt 60 °C.

Elektrische Daten

Versorgungsstromkreis ..... Gleichspannung 20 ...30 V DC
(Klemmen 14 und 15 bzw. Powerrailkontakte) Sicherheitstechnische Maximalspannung: U_m = 253 V AC
U_m = 125 V DC

Ausgangsstromkreise ..... Wechselstrom
(Klemmen 7, 8, 9 bzw. 10, 11, 12)
$U \leq 253$ V
$I \leq 2$ A
$S \leq 500$ VA
$\cos\varphi \geq 0{,}7$

Gleichstrom
$U \leq 40$ V
$I \leq 2$ A
$P \leq 80$ W

$U \leq 130$ V
$I \leq 20$ mA

Sicherheitst. Maximalspannung: U_m = 253 V AC

Eingangsstromkreise ..... in Zündschutzart Eigensicherheit EEx ia IIA/IIB/IIC
(Klemmen 1, 2, 3 bzw. 4, 5, 6)..... bzw. EEx ib IIA/IIB/IIC

Höchstwerte je Stromkreis:
U_o = 10,5 V
I_o = 13 mA
P_o = 34 mW
R_i = 807,7 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

Zündschutzart	EEx ia bzw. ib		
	IIA	IIB	IIC
höchstzulässige äuß. Induktivit L_o	1 H	840 mH	210 mH
höchstzulässige äuß. Kapazität C_o	75 µF	16,8 µF	2,41 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten im eigensicheren Eingangsstromkreis sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der Kategorie „ia" der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	EEx ia	
	IIB	IIC
höchstzulässige äußere Induktivit L_o	7 mH	3 mH
höchstzulässige äußere Kapazität C_o	2,1 µF	620 nF

Bei der Zusammenschaltung beider eigensicherer Eingangsstromkreise ergeben sich folgende Höchstwerte:

U_o = 10,5 V
I_o = 26 mA
P_o = 68 mW
R_i = 403,9 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

Zündschutzart	EEx ia bzw. ib		
	IIA	IIB	IIC
höchstzulässige äuß. Induktivit L_o	420 mH	210 mH	52 mH
höchstzulässige äuß. Kapazität C_o	75 µF	16,8 µF	2,41 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten in den zusammengeschaltenen eigensicheren Eingangsstromkreisen sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der Kategorie „ia" der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	EEx ia	
	IIB	IIC
höchstzulässige äußere Induktivit L_o	7 mH	3 mH
höchstzulässige äußere Kapazität C_o	2,1 µF	590 nF

Die eigensicheren Eingangsstromkreise sind von allen weiteren Stromkreisen bis zu einem Scheitelwert der Nennspannung von 375 V sicher galvanisch getrennt.

(16) Prüfbericht PTB Ex 00-20205

(17) Besondere Bedingungen

keine

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

durch Normen abgedeckt

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Braunschweig, 20. Juli 2000

Dr.-Ing. U. Johannsmeyer, z.Z. abwesend
Regierungsdirektor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 00 ATEX 2080

(4) Equipment: Isolation Switching Amplifier type K*D*-SR*-Ex*.W.*

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: Königsberger Allee 87, D-68307 Mannheim

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 00-20205.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997 **EN 50020:1994**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

Ex II (1) G D [EEx ia] IIC

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, July 20, 2000

In the absence of Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

(15) Description of equipment

The isolation switching amplifier type K*D*-SR*-Ex*.W.* is used for the transmission of control commands from the hazardous area into the non-hazardous area as well as for the safe electrical isolation of intrinsically safe and nonintrinsically safe circuits.

The maximum permissible ambient temperature is 60°C.

Electrical data

Supply circuit (terminals 14 and 15 resp. powerrail contacts): direct voltage 20...30 V DC
maximum voltage: U_m = 253 V AC
U_m = 125 V DC

Output circuits (terminals 7, 8, 9 resp. 10, 11, 12): alternating current
$U \leq 253$ V
$I \leq 2$ A
$S \leq 500$ VA
$\cos\varphi \geq 0.7$

direct current
$U \leq 40$ V
$I \leq 2$ A
$P \leq 80$ W

$U \leq 130$ V
$I \leq 20$ mA

maximum voltage: U_m = 253 V AC

Input circuits (terminals 1, 2, 3 resp. 4, 5, 6): type of protection Intrinsic Safety EEx ia IIA/IIB/IIC resp. EEx ib IIA/IIB/IIC
maximum values per circuit:
U_o = 10.5 V
I_o = 13 mA
P_o = 34 mW
R_i = 807.7 Ω
linear characteristic
$C_i \approx 0$
$L_i \approx 0$

type of protection	EEx ia resp. ib		
	IIA	IIB	IIC
maximum permissible external inductance L_O	1 H	840 mH	210 mH
maximum permissible external capacitance C_O	75 µF	16.8 µF	2.41 µF

In the presence of concentrated capacitances and/or inductances in the intrinsically safe input circuit, the maximum permissible external capacitances and inductances for circuits of category „ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
maximum permissible external inductance L_O	7 mH	3 mH
maximum permissible external capacitance C_O	2.1 µF	620 nF

When both intrinsically safe input circuits are interconnected, the following maximum values result:
U_o = 10.5 V
I_o = 26 mA
P_o = 68 mW
R_i = 403.9 Ω
linear characteristic
$C_i \approx$ 0
$L_i \approx$ 0

type of protection	EEx ia resp. ib		
	IIA	IIB	IIC
maximum permissible external inductance L_O	420 mH	210 mH	52 mH
maximum permissible external capacitance C_O	75 µF	16.8 µF	2.41 µF

In the presence of concentrated capacitances and/or inductances in the interconnnected intrinsically safe input circuits, the maximum permissible external capacitances and inductances for circuits of category „ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
maximum permissible external inductance L_O	7 mH	3 mH
maximum permissible external capacitance C_O	2.1 µF	590 nF

The intrinsically safe input circuits are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V.

(16) Test report PTB Ex 00-20205

(17) Special conditions for safe use

None

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

(18) Essential health and safety requirements

met by standards

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, July 20, 2000

In the absence of Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin

(1) **EC-Type Examination Certificate**

(2) Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-Type Examination Certificate Number

PTB 00 ATEX 2080

(4) Equipment: Transformer Isolated Switching Amplifier Type K*D*-SR*-Ex*.W.*

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: Königsberger Allee 87, D-68307 Mannheim

(7) The design of this electrical apparatus as well as the different permissible versions are specified in the annex to this type examination certificate.

(8) Physikalisch-Technische Bundesanstalt being notified body number 0102 in accordance with Article 9 of the Council Directive of the European Communities of 23 March 1994 (94/9/EC) confirms the compliance with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The results of the examination are recorded in the confidential test report PTB Ex 00-20205.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with

EN 50014:1997 **EN 50020:1994**

(10) If the sign "**X**" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design and construction of the specified equipment in accordance with the Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following details:

 **II (1) G D** **[EEx ia] IIC**

Certification Body Explosion Protection
on behalf of

(signature)

Dr-Ing U. Johannsmeyer, in absence
Senior Government Official

Braunschweig, 20 July 2000

(13) **SCHEDULE**

(14) **EC-Type Examination Certificate PTB 00 ATEX 2080**

(15) Description of the Equipment

The Transformer Isolated Switching Amplifier Type K*D*-SR*-Ex*.W.* is designed for the transmission of control commands from the hazardous area to the non-hazardous area and for the galvanic isolation of intrinsically safe and non intrinsically safe circuits.

The max. permissible ambient temperature is 60°C.

Electrical parameters

Supply circuit (terminals 14 and 15 alt. power rail contacts): DC 20 ...30 V DC
safety relevant maximum voltage: V_m = 253V AC
V_m = 125V DC

Output circuits (terminals 7, 8, 9 alt. 10, 11, 12):

AC	DC	
$V \leq 253V$	$V \leq 40V$	$V \leq 130V$
$I \leq 2A$	$I \leq 2A$	$I \leq 20mA$
$P_a \leq 500VA$	$P \leq 80W$	
$pf \geq 0.7$		

safety relevant maximum voltage: V_m = 253V AC

Input circuits (terminals 1, 2, 3 alt. 4, 5, 6): for ignition protection intrinsic safety EEx ia IIA/IIB/IIC
alt. EEx ib IIA/IIB/IIC
maximum values for each circuit:
V_o = 10.5 V
I_o = 13 mA
P_o = 34 mW
R_i = 807.7 Ω
linear characteristic
$C_i \approx 0$
$L_i \approx 0$

type of protection	EEx ia alt. ib		
	IIA	IIB	IIC
max. permissible ext. inductance L_o	1 H	840 mH	210 mH
max. permissible ext. capacitance C_o	75 µF	16.8 µF	2.41 µF

Schedule to EC-Type Examination Certificate PTB 00 ATEX 2080

In the presence of concentrated capacitance and/or inductance in the intrinsically safe input circuit the maximum permissible external capacitance and inductance for the circuits of category "ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
max. permissible ext. inductance L_o	7 mH	3 mH
max. permissible ext. capacitance C_o	2.1 µF	620 nF

When interconnecting both intrinsically safe input circuits the following maximum values apply:
V_o = 10.5 V
I_o = 26 mA
P_o = 68 mW
R_i = 403.9 Ω
linear characteristic
$C_i \approx 0$
$L_i \approx 0$

type of protection	EEx ia alt ib		
	IIA	IIB	IIC
max. permissible ext. inductance L_o	420 mH	210 mH	52 mH
max. permissible ext. capacitance C_o	75 µF	16.8 µF	2.41 µF

In the presence of concentrated capacitance and/or inductance in the interconnected intrinsically safe input circuits the maximum permissible external capacitance and inductance for the circuits of category "ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
max. permissible ext. inductance L_o	7 mH	3 mH
max. permissible ext. capacitance C_o	2.1 µF	590 nF

The intrinsically safe input circuits are electrically safely isolated against all other electrical circuits up to the peak value of the nominal voltage of 375V.

(16) Test Report PTB Ex 00-20205

(17) Special Conditions

none

Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin

Schedule to EC-Type Examination Certificate PTB 00 ATEX 2080

(18) Essential Health and Safety Requirements

covered by standards

Certification Body Explosion Protection
on behalf of

(signature)

Dr-Ing U. Johannsmeyer, in absence
Senior Government Official

Braunschweig, 20 July 2000

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. E R G Ä N Z U N G

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Gerät: Trennschaltverstärker Typ K*D*-SR*-Ex*.W.*

Kennzeichnung: Ⓔx **II (1) G D [EEx ia] IIC**

Hersteller: Pepperl + Fuchs GmbH

Anschrift: Königsberger Allee 87
68307 Mannheim, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Trennschaltverstärker Typ K*D*-SR*-Ex*.W.* wurde technisch überarbeitet und darf zukünftig auch entsprechend den Prüfungsunterlagen des Prüfberichtes PTB Ex 01-21062 gefertigt und betrieben werden. Die Änderungen betreffen den inneren Aufbau, das Gehäuse sowie die „Elektrischen Daten".

Die „Elektrischen Daten" werden um einen Fehlermeldeausgang sowie um ein zusätzliches Wertepaar für die Ausgangsstromkreise bei Wechselstrombetrieb erweitert.

Die EG-Baumusterprüfbescheinigung wird um den Trennschaltverstärker Typ **K*D*-SR*-Ex2.W.IR** erweitert. Diese Typenvariante unterscheidet sich nur durch die Firmware von den bereits bescheinigten Varianten.

Alle anderen Angaben gelten unverändert auch für diese erste Ergänzung.

Elektrische Daten

Fehlermeldeausgang (Powerrailkontakt PR4)	Sicherheitst. Maximalspannung:			U_m= 40 V DC			
Ausgangsstromkreise (Klemmen 7, 8, 9 bzw. 10, 11, 12)	Wechselstrom			Gleichstrom			
	$U \leq 253$ V	$U \leq 126{,}5$ V		$U \leq 40$ V	$U \leq 130$ V		
	$I \leq 2$ A	$I \leq 4$ A		$I \leq 2$ A	$I \leq 20$ mA		
	$S \leq 500$ VA			$P \leq 80$ W			
	$\cos\varphi \geq 0{,}7$						
	Sicherheitst. Maximalspannung:			U_m= 253 V AC			

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Prüfbericht: PTB Ex 01-21062

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, 13. September 2001

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1st SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

(Translation)

Equipment: Isolation and Switching Amplifier type K*D*-SR*-Ex*.W.*

Marking: ⟨Ex⟩ **II (1) G D [EEx ia] IIC**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87
D-68307 Mannheim, Germany

Description of supplements and modifications

The isolation and switching amplifier of type K*D*-SR*-Ex*.W.* has been technically modified and may in future also be manufactured and operated according to the test documents of test report PTB Ex 01-21062. The modifications concern the internal structure, the enclosure, and the "electrical data".

The "electrical data" are extended to additionally include a fault signal output as well as an additional pair of values for the output circuits when a.c. operated.

The EC type-examination certificate is extended to additionally include the isolation and switching amplifier type **K*D*-SR*-Ex2.W.IR**. This type differs from the previously certified versions only in the firmware.

All other details apply without any changes for this first supplement.

Electrical data

Fault signal output (power rail contact PR4)	Safety voltage, max:				U_m =	40	V DC				
Output circuits (terminals 7, 8, 9 and 10, 11, 12)	AC				DC						
	U ≤ 253	V	U ≤126.5	V	U ≤	40	V	U ≤	130	V	
	I ≤ 2	A	I ≤ 4	A	I ≤	2	A	I ≤	20	mA	
	S ≤ 500	VA			P ≤	80	W				
	cosφ ≥ 0.7										
	Safety voltage, max.:				U_m =	253	V AC				

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1st SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

Test report: PTB Ex 01-21062

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, 13 September 2001

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. E R G Ä N Z U N G

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Gerät:	Trennschaltverstärker Typ K*D*-SR*-Ex*.W.*
Kennzeichnung:	⟨Ex⟩ **II (1) G D [EEx ia] IIC**
Hersteller:	Pepperl + Fuchs GmbH
Anschrift:	Königsberger Allee 87 68307 Mannheim, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Trennschaltverstärker Typ K*D*-SR*-Ex*.W.* wurde technisch überarbeitet und kann zukünftig auch entsprechend den Prüfungsunterlagen des Prüfberichtes PTB Ex 04-24230 gefertigt und betrieben werden. Die Änderungen betreffen den inneren Aufbau.

Die „Elektrischen Daten" sowie alle anderen Angaben gelten unverändert auch für diese zweite Ergänzung.

Prüfbericht: PTB Ex 04-24230

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, 18. November 2004

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

(Translation)

Equipment: Isolation switching amplifier, type K*D*-SR*-Ex*.W.*

Marking: ⟨Ex⟩ **II (1) G D [EEx ia] IIC**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87
68307 Mannheim, Germany

Description of supplements and modifications

The isolation switching amplifier, type K*D*-SR*-Ex*.W.* has been technically revised. In the future it may also be manufactured and operated in accordance with the test documents listed in the test report PTB Ex 04-24230. The modifications concern the internal construction.

The "Electrical data" as well as all other specifications apply without changes also for this 2nd supplement.

Test report: PTB Ex 04-24230

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, November 18, 2004

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. ERGÄNZUNG

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Gerät: Trennschaltverstärker Typ K*D*-SR*-Ex*.W.*

Kennzeichnung: Ⓔx **II (1) G D [EEx ia] IIC**

Hersteller: Pepperl + Fuchs GmbH

Anschrift: Königsberger Allee 87, 68307 Mannheim, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Trennschaltverstärker Typ K*D*-SR*-Ex*.W.* wurde technisch überarbeitet und darf zukünftig auch entsprechend den Prüfungsunterlagen des Prüfberichtes PTB Ex 11-28333 gefertigt und betrieben werden.

Die Änderungen betreffen die Anschrift des Herstellers, die angewandten Normen, die Kennzeichnung, den inneren Aufbau sowie das Gehäuse.

Die „Elektrischen Daten“ sowie alle anderen Angaben gelten unverändert.

Die Anschrift des Herstellers ändert sich wie folgt:

Hersteller: Pepperl + Fuchs GmbH

Anschrift: Lilienthalstrasse 200, 68307 Mannheim, Deutschland

Die Kennzeichnung des Trennschaltverstärkers Typ K*D*-SR*-Ex*.W.* lautet zukünftig:

Ⓔx **II (1) G [Ex ia] IIC bzw.** Ⓔx **II (1) D [Ex ia] IIIC**

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Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • DEUTSCHLAND

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Angewandte Normen

EN 60079-0:2009, EN 60079-11:2007, EN 61241-11:2006

Bewertungs- und Prüfbericht: PTB Ex 11-28333

Zertifizierungssektor Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, 27. Mai 2011

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • DEUTSCHLAND

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. S U P P L E M E N T

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

(Translation)

Equipment: Isolation switching amplifier, type K*D*-SR*-Ex*.W.*

Marking: **II (1) G D [EEx ia] IIC**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87, 68307 Mannheim, Germany

Description of supplements and modifications

The isolation switching amplifier, type K*D*-SR*-Ex*.W.* has been technically revised. In the future it may also be manufactured and operated in accordance with the test documents listed in test report PTB Ex 11-28333.

The modifications concern the address of the manufacturer, the standards applied, the marking, the internal construction as well as the enclosure.

The "Electrical data" as well as all other specifications apply without changes.

The manufacturer´s address changes as follows:

Manufacturer: Pepperl + Fuchs GmbH

Address: Lilienthalstrasse 200, 68307 Mannheim, Germany

In the future the marking of the isolation switching amplifier, type K*D*-SR*-Ex*.W.* will read:

II (1) G [Ex ia] IIC or II (1) D [Ex ia] IIIC

ZSEx10101e.dotm

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

Applied standards

EN 60079-0:2009, EN 60079-11:2007, EN 61241-11:2006

Assessment and test report: PTB Ex 11-28333

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, May 27, 2011

(signature)

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

2 pages, correct and complete as regards content.
By order:

Dr.-Ing. T. Horn

Braunschweig, August 20, 2012

4. E R G Ä N Z U N G

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Gerät:	Trennschaltverstärker Typ K*D*-SR*-Ex*.W.*
Kennzeichnung:	Ⓔx **II (1) G [Ex ia] IIC bzw. II (1) D [Ex ia] IIIC**
Hersteller:	Pepperl+Fuchs GmbH
Anschrift:	Lilienthalstraße 200, 68307 Mannheim, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Trennschaltverstärker Typ KFD*-SR*-Ex*.W.* wurde technisch überarbeitet und kann zukünftig auch entsprechend den Prüfungsunterlagen des Prüfberichtes PTB Ex 14-24080 gefertigt und betrieben werden.

Die Änderungen betreffen die angewandten Normen, die Kennzeichnung, die Erweiterung der „Elektrischen Daten“ um Werte für die Explosionsgruppen I und IIIC sowie den inneren Aufbau. Trennschaltverstärker vom Typ KHD*-SR*-Ex*.W.* (KH = Klemmengehäuse, hoch) werden nicht mehr gebaut.
Alle anderen Angaben gelten unverändert.

Die neue Kennzeichnung lautet:

Ⓔx **II (1) G [Ex ia Ga] IIC bzw. II (1) D [Ex ia Da] IIIC bzw. I (M1) [Ex ia Ma] I**

Elektrische Daten

Versorgungsstromkreis ..... (Klemmen 14 und 15 bzw. Powerrailkontakte PR 1 und PR2)	Gleichspannung 20 ... 30 V DC Sicherheitstechnische Maximalspannung: bzw.	U_m = 253 V AC U_m = 125 V DC
Fehlermeldeausgang ..... (Powerrailkontakt PR 4)	Sicherheitstechnische Maximalspannung:	U_m = 40 V DC

Physikalisch-Technische Bundesanstalt

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4. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Ausgangsstromkreise ..... (Klemmen 7, 8, 9 bzw. 10, 11, 12)

Wechselstrom		Gleichstrom	
$U \leq 253$ V	$U \leq 126{,}5$ V	$U \leq 40$ V	$U \leq 130$ V
$I \leq 2$ A	$I \leq 4$ A	$I \leq 2$ A	$I \leq 20$ mA
$S \leq 500$ VA		$P \leq 80$ W	
$\cos\varphi \geq 0{,}7$			

Sicherheitstechnische Maximalspannung: $U_m = 253$ V AC

Eingangsstromkreise ..... (Klemmen 1, 2, 3 bzw. 4, 5, 6)

in Zündschutzart Eigensicherheit Ex ia I/IIA/IIB/IIC/IIIC
bzw. Ex ib I/IIA/IIB/IIC/IIIC

Höchstwerte je Stromkreis:

U_o = 10,5 V
I_o = 13 mA
P_o = 34 mW
R_i = 807,7 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	1 H	1 H	840 mH	210 mH
C_o	95 µF	75 µF	16,8 µF	2,41 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten im eigensicheren Eingangsstromkreis sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	7 mH	3 mH
C_o	5,3 µF	4,6 µF	2,1 µF	620 nF

Bei der Zusammenschaltung beider eigensicherer Eingangsstromkreise ergeben sich folgende Höchstwerte:

U_o = 10,5 V
I_o = 26 mA
P_o = 68 mW
R_i = 403,9 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

4. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2080

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	500 mH	420 mH	210 mH	52 mH
C_o	95 µF	75 µF	16,8 µF	2,41 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten in den zusammengeschaltenen eigensicheren Eingangsstromkreisen sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	7 mH	3 mH
C_o	5,1 µF	4,4 µF	2,1 µF	590 nF

Die eigensicheren Eingangsstromkreise sind von allen weiteren Stromkreisen bis zu einem Scheitelwert der Nennspannung von 375 V sicher galvanisch getrennt.

Angewandte Normen

EN 60079-0:2012, EN 60079-11:2012

Prüfbericht: PTB Ex 14-24080

Konformitätsbewertungsstelle, Sektor Explosionsschutz
Im Auftrag

Braunschweig, 20. August 2014

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

4. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

(Translation)

Equipment: Isolation and switching amplifier, type K*D*-SR*-Ex*.W.*

Marking: **II (1) G [Ex ia] IIC or II (1) D [Ex ia] IIIC**

Manufacturer: Pepperl+Fuchs GmbH

Address: Lilienthalstraße 200, 68307 Mannheim, Germany

Description of supplements and modifications

The isolation and switching amplifier of type KFD*-SR*-Ex*.W.* was technically revised. In the future it can also be manufactured and operated according to the test documents listed in test report PTB Ex 14-24080 .

The modifications concern the applied standards, the marking, the extension of the "electrical data" by values for explosion groups I and IIIC as well as the internal construction. Iisolation and switching amplifiers of type KHD*-SR*-Ex*.W.* (KH = terminal housing, high) are no longer produced.
All other specifications apply without changes.

The new marking reads:

II (1) G [Ex ia Ga] IIC or II (1) D [Ex ia Da] IIIC or I (M1) [Ex ia Ma] I

Electrical data

Supply circuit ..... (terminals 14 and 15 or Powerrail contacts PR 1 and PR2)	Direct voltage 20 ... 30 V DC Safety-related maximum voltage: or	 U_m = 253 V AC U_m = 125 V DC
Fehlermeldeausgang ..... (Powerrail contact PR 4)	Safety-related maximum voltage:	U_m = 40 V DC

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

Output circuits..... alternating current direct current
(terminals 7, 8, 9 bzw. 10, 11, 12)

$U \leq 253$ V	$U \leq 126{,}5$ V	$U \leq 40$ V	$U \leq 130$ V
$I \leq 2$ A	$I \leq 4$ A	$I \leq 2$ A	$I \leq 20$ mA
$S \leq 500$ VA		$P \leq 80$ W	
$\cos\varphi \geq 0.7$			

Safety-related maximum voltage: $U_m = 253$ V AC

Input circuits ..... type of protection Intrinsic Safety Ex ia I/IIA/IIB/IIC/IIIC
(terminals 1, 2, 3 or 4, 5, 6) or Ex ib I/IIA/IIB/IIC/IIIC

Maximum values per circuit:
U_o = 10.5 V
I_o = 13 mA
P_o = 34 mW
R_i = 807.7 Ω
linear characteristic
$C_i \approx 0$
$L_i \approx 0$

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	1 H	1 H	840 mH	210 mH
C_o	95 µF	75 µF	16.8 µF	2.41 µF

With the existence of concentrated capacitances and/or inductances in the interconnected intrinsically safe input circuits, the maximum permissible external capacitances and inductances for the circuits shall be taken from the following table.

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	7 mH	3 mH
C_o	5.3 µF	4.6 µF	2.1 µF	620 nF

The following values apply to the interconnection of both intrinsically safe input circuits:
U_o = 10.5 V
I_o = 26 mA
P_o = 68 mW
R_i = 403.9 Ω
linear characteristic
$C_i \approx 0$
$L_i \approx 0$

Physikalisch-Technische Bundesanstalt

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4. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2080

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	500 mH	420 mH	210 mH	52 mH
C_o	95 µF	75 µF	16.8 µF	2.41 µF

With the existence of concentrated capacitances and/or inductances in the interconnected intrinsically safe input circuits, the maximum permissible external capacitances and inductances for the circuits shall be taken from the following table.

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	7 mH	3 mH
C_o	5.1 µF	4.4 µF	2.1 µF	590 nF

The intrinsically safe input circuits are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V

Applied standards

EN 60079-0:2012, EN 60079-11:2012

Test report: PTB Ex 14-24080

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, August 20, 2014

(signature)

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

3 pages, correct and complete as regards content.
On behalf of PTB:

Dr.-Ing. T. Horn
Regierungsrat

Braunschweig, January 22, 2015

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) # EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 94/9/EG**

(3) EG-Baumusterprüfbescheinigungsnummer

PTB 00 ATEX 2081

(4) Gerät: Trennschaltverstärker Typ K*A*-SR*-Ex*.W.*

(5) Hersteller: Pepperl + Fuchs GmbH

(6) Anschrift: Königsberger Allee 87, D-68307 Mannheim

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Physikalisch-Technische Bundesanstalt bescheinigt als benannte Stelle Nr. 0102 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht PTB Ex 00-20203 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 50014:1997 **EN 50020:1994**

(10) Falls das Zeichen „X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Bau des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes.

(12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:

II (1) G D [EEx ia] IIC

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer, z.Z. abwesend
Regierungsdirektor

Braunschweig, 20. Juli 2000

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

(13) # Anlage

(14) ## EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

(15) Beschreibung des Gerätes

Der Trennschaltverstärker Typ K*A*-SR*-Ex*.W.*dient zur Übertragung von Steuerbefehlen aus dem explosionsgefährdeten Bereich in den nichtexplosionsgefährdeten Bereich sowie zur sicheren galvanischen Trennung von eigensicheren und nichteigensicheren Stromkreisen.

Die höchstzulässige Umgebungstemperatur beträgt 60 °C.

Elektrische Daten

Versorgungsstromkreis ..... 230 V AC ±10 %
(Klemmen 14 und 15) Sicherheitst. Maximalspannung: U_m = 253 V AC
bzw.
115 V AC ±10 %
Sicherheitst. Maximalspannung: U_m = 126,5 V AC

Ausgangsstromkreise ..... Wechselstrom
(Klemmen 7, 8, 9 bzw. 10, 11, 12)
$U \leq 253$ V
$I \leq 2$ A
$S \leq 500$ VA
$\cos\varphi \geq 0{,}7$

Gleichstrom
$U \leq 40$ V
$I \leq 2$ A
$P \leq 80$ W

Gleichstrom
$U \leq 130$ V
$I \leq 20$ mA

Sicherheitst. Maximalspannung: U_m = 253 V AC

Eingangsstromkreise ..... in Zündschutzart Eigensicherheit EEx ia IIA/IIB/IIC
(Klemmen 1, 2, 3 bzw. 4, 5, 6) bzw. EEx ib IIA/IIB/IIC
Höchstwerte je Stromkreis:
U_o = 10,6 V
I_o = 19,1 mA
P_o = 51 mW
R_i = 554,4 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

Zündschutzart	EEx ia bzw. ib		
	IIA	IIB	IIC
höchstzulässige äuß. Induktivit L_o	780 mH	390 mH	97 mH
höchstzulässige äuß. Kapazität C_o	72 µF	16,2 µF	2,32 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten im eigensicheren Eingangsstromkreis sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der Kategorie „ia" der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	EEx ia	
	IIB	IIC
höchstzulässige äußere Induktivit L_o	5 mH	3 mH
höchstzulässige äußere Kapazität C_o	2,1 µF	590 nF

Bei der Zusammenschaltung beider eigensicherer Eingangsstromkreise ergeben sich folgende Höchstwerte:

U_o = 10,6 V
I_o = 38,2 mA
P_o = 102 mW
R_i = 277,2 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

Zündschutzart	EEx ia bzw. ib		
	IIA	IIB	IIC
höchstzulässige äuß. Induktivit L_o	195 mH	97 mH	24 mH
höchstzulässige äuß. Kapazität C_o	72µF	16,2 µF	2,32 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten in den zusammengeschaltenen eigensicheren Eingangsstromkreisen sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der Kategorie „ia" der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	EEx ia	
	IIB	IIC
höchstzulässige äußere Induktivit L_o	5mH	3 mH
höchstzulässige äußere Kapazität C_o	2 µF	550 nF

Die eigensicheren Eingangsstromkreise sind von allen weiteren Stromkreisen bis zu einem Scheitelwert der Nennspannung von 375 V sicher galvanisch getrennt.

(16) Prüfbericht PTB Ex 00-20203

(17) Besondere Bedingungen

keine

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

durch Normen abgedeckt

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Braunschweig, 20. Juli 2000

i.A. Ihle

Dr.-Ing. U. Johannsmeyer, z.Z. abwesend
Regierungsdirektor

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

PTB

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 00 ATEX 2081

(4) Equipment: Isolation Switching Amplifier type K*A*-SR*-Ex*.W.*

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: Königsberger Allee 87, D-68307 Mannheim

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 00-20203.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997 **EN 50020:1994**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II (1) G D [EEx ia] IIC

Zertifizierungsstelle Explosionsschutz
By order:

In the absence of Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, July 20, 2000

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(15) Description of equipment

The isolation switching amplifier type K*A*-SR*-Ex*.W.* is used for the transmission of control commands from the hazardous area into the non-hazardous area as well as for the safe electrical isolation of intrinsically safe and nonintrinsically safe circuits.

The maximum permissible ambient temperature is 60°C.

Electrical data

Supply circuit ..... (terminals 14 and 15)	230 V AC ±10 % maximum voltage:	U_m = 253 V AC	
	resp. 115 V AC ±10 % maximum voltage:	U_m = 126.5 V AC	
Output circuits..... (terminals 7, 8, 9 resp. 10, 11, 12)	alternating current $U \leq$ 253 V $I \leq$ 2 A $S \leq$ 500 VA $\cos\varphi \geq 0.7$	direct current $U \leq$ 40 V $I \leq$ 2 A $P \leq$ 80 W	 $U \leq$ 130 V $I \leq$ 20 mA
	maximum voltage:	U_m = 253 V AC	
Input circuits ..... (terminals 1, 2, 3 resp. 4, 5, 6)	type of protection Intrinsic Safety EEx ia IIA/IIB/IIC resp. EEx ib IIA/IIB/IIC		
	maximum values per circuit: U_o = 10.6 V I_o = 19.1 mA P_o = 51 mW R_i = 554.4 Ω linear characteristic $C_i \approx 0$ $L_i \approx 0$		

type of protection	EEx ia resp. ib		
	IIA	IIB	IIC
maximum permissible external inductance L_0	780 mH	390 mH	97 mH
maximum permissible external capacitance C_0	72 µF	16.2 µF	2.32 µF

In the presence of concentrated capacitances and/or inductances in the intrinsically safe input circuit, the maximum permissible external capacitances and inductances for circuits of category „ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
maximum permissible external inductance L_0	5 mH	3 mH
maximum permissible external capacitance C_0	2.1 µF	590 nF

When both intrinsically safe input circuits are interconnected, the following maximum values result:

U_o = 10.6 V
I_o = 38.2 mA
P_o = 102 mW
R_i = 277.2 Ω
linear characteristic
$C_i \approx$ 0
$L_i \approx$ 0

type of protection	EEx ia resp. ib		
	IIA	IIB	IIC
maximum permissible external inductance L_0	195 mH	97 mH	24 mH
maximum permissible external capacitance C_0	72 µF	16.2 µF	2.32 µF

In the presence of concentrated capacitances and/or inductances in the interconnnected intrinsically safe input circuits, the maximum permissible external capacitances and inductances for circuits of category „ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
maximum permissible external inductance L_0	5 mH	3 mH
maximum permissible external capacitance C_0	2 µF	550 nF

The intrinsically safe input circuits are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V.

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(16) Test report PTB Ex 00-20203

(17) Special conditions for safe use

None

(18) Essential health and safety requirements

met by standards

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, July 20, 2000

In the absence of Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin

(1) **EC-Type Examination Certificate**

(2) Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-Type Examination Certificate Number

PTB 00 ATEX 2081

(4) Equipment: Transformer Isolated Switching Amplifier Type K*A*-SR*-Ex*.W.*

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: Königsberger Allee 87, D-68307 Mannheim

(7) The design of this electrical apparatus as well as the different permissible versions are specified in the annex to this type examination certificate.

(8) Physikalisch-Technische Bundesanstalt being notified body number 0102 in accordance with Article 9 of the Council Directive of the European Communities of 23 March 1994 (94/9/EC) confirms the compliance with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The results of the examination are recorded in the confidential test report PTB Ex 00-20203.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with

EN 50014:1997 **EN 50020:1994**

(10) If the sign "**X**" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type examination certificate relates only to the design and construction of the specified equipment in accordance with the Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following details:

Ex II (1) G D [EEx ia] IIC

Certification Body Explosion Protection
on behalf of

(signature)

Dr.-Ing. U. Johannsmeyer, in absence
Senior Government Official

Braunschweig, 20 July 2000

(13) **SCHEDULE**

(14) **EC-Type Examination Certificate PTB 00 ATEX 2081**

(15) Description of the Equipment

The Transformer Isolated Switching Amplifier Type K*A*-SR*-Ex*.W.* is designed for the transmission of control commands from the hazardous area to the non-hazardous area and for the galvanic isolation of intrinsically safe and non intrinsically safe circuits.

The max. permissible ambient temperature is 60°C.

Electrical parameters

Supply circuit.....230 V AC ± 10%
(terminals 14 and 15) safety relevant maximum voltage: V_m = 253V AC
alternatively
115V AC ± 10%
safety relevant max. voltage: V_m = 126.5V AC

Output circuits.....	AC	DC	
(terminals 7, 8, 9 alt.	$V \leq 253V$	$V \leq 40V$	$V \leq 130V$
10, 11, 12)	$I \leq 2A$	$I \leq 2A$	$I \leq 20mA$
	$P_a \leq 500VA$	$P \leq 80W$	
	$pf \geq 0.7$		

safety relevant maximum voltage: V_m = 253V AC

Input circuits.....for ignition protection intrinsic safety EEx ia IIA/IIB/IIC
(terminals 1, 2, 3 alt. 4, 5, 6) alt. EEx ib IIA/IIB/IIC
maximum values for each circuit:
V_o = 10.6 V
I_o = 19.1 mA
P_o = 51 mW
R_i = 554.4 Ω
linear characteristic
$C_i \approx 0$
$L_i \approx 0$

type of protection	EEx ia alt. ib		
	IIA	IIB	IIC
max. permissible ext. inductance L_o	780 mH	390 mH	97 mH
max. permissible ext. capacitance C_o	72 µF	16.2 µF	2.32 µF

Schedule to EC-Type Examination Certificate PTB 00 ATEX 2081

In the presence of concentrated capacitance and/or inductance in the intrinsically safe input circuit the maximum permissible external capacitance and inductance for the circuits of category "ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
max. permissible ext. inductance L_o	5 mH	3 mH
max. permissible ext. capacitance C_o	2.1 µF	590 nF

When interconnecting both intrinsically safe input circuits the following maximum values apply:
V_o = 10.6 V
I_o = 38.2 mA
P_o = 102 mW
R_i = 277.2 Ω
linear characteristic
$C_i \approx 0$
$L_i \approx 0$

type of protection	EEx ia alt ib		
	IIA	IIB	IIC
max. permissible ext. inductance L_o	195 mH	97 mH	24 mH
max. permissible ext. capacitance C_o	72 µF	16.2 µF	2.32 µF

In the presence of concentrated capacitance and/or inductance in the interconnected intrinsically safe input circuits the maximum permissible external capacitance and inductance for the circuits of category "ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
max. permissible ext. inductance L_o	5 mH	3 mH
max. permissible ext. capacitance C_o	2 µF	550 nF

The intrinsically safe input circuits are electrically safely isolated against all other electrical circuits up to the peak value of the nominal voltage of 375V.

(16) Test Report PTB Ex 00-20203

(17) Special Conditions

none

Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin

Schedule to EC-Type Examination Certificate PTB 00 ATEX 2081

(18) Essential Health and Safety Requirements

covered by standards

Certification Body Explosion Protection
on behalf of

(signature)

Dr.-Ing. U. Johannsmeyer, in absence
Senior Government Official

Braunschweig, 20 July 2000

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. E R G Ä N Z U N G

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

Gerät: Trennschaltverstärker Typ K*A*-SR*-Ex*.W.*

Kennzeichnung: Ⓔx **II (1) G D [EEx ia] IIC**

Hersteller: Pepperl + Fuchs GmbH

Anschrift: Königsberger Allee 87
68307 Mannheim, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Trennschaltverstärker Typ K*A*-SR*-Ex*.W.* wurde technisch überarbeitet und darf zukünftig auch entsprechend den Prüfungsunterlagen des Prüfberichtes PTB Ex 01-21063 gefertigt und betrieben werden. Die Änderungen betreffen den inneren Aufbau, das Gehäuse sowie die „Elektrischen Daten". Die „Elektrischen Daten" werden um eine Versorgungsspannung sowie um ein zusätzliches Wertepaar für die Ausgangsstromkreise bei Wechselstrombetrieb erweitert.

Die EG-Baumusterprüfbescheinigung wird um den Trennschaltverstärker Typ **K*A*-SR*-Ex2.W.IR** erweitert. Diese Typenvariante unterscheidet sich nur durch die Firmware von den bereits bescheinigten Varianten. Die Typbezeichnung des Trennschaltverstärkers mit dem neuen Versorgungsspannungsbereich von 100 VAC ± 10 % lautet: **K*A4-SR*-Ex*.W.*** .

Alle anderen Angaben gelten unverändert auch für diese erste Ergänzung.

Elektrische Daten

Versorgungsstromkreis ..... (Klemmen 14 und 15)	230 V AC ±10 % Sicherheitst. Maximalspannung: U_m = 253 V AC bzw. 115 V AC ±10 % Sicherheitst. Maximalspannung: U_m = 126,5 V AC bzw. 100 V AC ±10 % Sicherheitst. Maximalspannung: U_m = 110 V AC

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

Ausgangsstromkreise	Wechselstrom				Gleichstrom			
(Klemmen 7, 8, 9 bzw. 10, 11, 12)	$U \leq 253$	V	$U \leq 126{,}5$	V	$U \leq 40$	V	$U \leq 130$	V
	$I \leq 2$	A	$I \leq 4$	A	$I \leq 2$	A	$I \leq 20$	mA
	$S \leq 500$	VA			$P \leq 80$	W		
	$\cos\varphi \geq 0{,}7$							
	Sicherheitst. Maximalspannung:				$U_m = 253$	V AC		

Prüfbericht: PTB Ex 01-21063

Zertifizierungsstelle Explosionsschutz
Im Auftrag

Braunschweig, 13. September 2001

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1st SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(Translation)

Equipment: Isolation ans Switching Amplifier type K*A*-SR*-Ex*.W.*

Marking: ⟨Ex⟩ **II (1) G D [EEx ia] IIC**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87
D-68307 Mannheim, Germany

Description of supplements and modifications

The isolation and switching amplifier of type K*A*-SR*-Ex*.W.* has been technically modified and may in future also be manufactured and operated according to the test documents of test report PTB Ex 01-21063. The modifications concern the internal structure, the enclosure, and the "electrical data".

The "electrical data" are extended to additionally include a supply voltage as well as an additional pair of values for the output circuits when a.c. operated.

The EC type-examination certificate is extended to additionally include the isolation and switching amplifier type **K*A*-SR*-Ex2.W.IR**. This type differs from the previously certified versions only in the firmware. The isolation and switching amplifier with the new supply voltage range of 100 VAC ± 10 % carries the designation: **K*A4-SR*-Ex*.W.*** .

All other details apply without any changes for this first supplement.

Electrical data

Supply circuit	230 V AC ±10 %
(terminals 14 & 15)	safety voltage, max: U_m = 253 V AC
	or
	115 V AC ±10 %
	safety voltage, max.: U_m = 126.5 V AC
	or
	100 V AC ±10 %

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1st SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

safety voltage, max.: U_m = 110 V AC

Output circuits.....	AC				DC				
(terminals 7, 8, 9 & 10, 11, 12)	U ≤ 253	V	U ≤126.5	V	U ≤ 40	V	U ≤ 130	V	
	I ≤ 2	A	I ≤ 4	A	I ≤ 2	A	I ≤ 20	mA	
	S ≤ 500	VA			P ≤ 80	W			
	cosφ ≥ 0.7								
	safety voltage, max.:				U_m= 253	V AC			

Test report: PTB Ex 01-21063

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor

Braunschweig, 13 September 2001

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. E R G Ä N Z U N G

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

Gerät: Trennschaltverstärker Typ K*A*-SR*-Ex*.W.*

Kennzeichnung: Ⓔx **II (1) G D [EEx ia] IIC**

Hersteller: Pepperl + Fuchs GmbH

Anschrift: Königsberger Allee 87, 68307 Mannheim, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Trennschaltverstärker Typ K*A*-SR*-Ex*.W.* wurde technisch überarbeitet und darf zukünftig auch entsprechend den Prüfungsunterlagen des Prüfberichtes PTB Ex 11-29156 gefertigt und betrieben werden.

Die Änderungen betreffen die Anschrift des Herstellers, die angewandten Normen, die Kennzeichnung, den inneren Aufbau sowie das Gehäuse.

Die „Elektrischen Daten" sowie alle anderen Angaben gelten unverändert.

Die Anschrift des Herstellers ändert sich wie folgt:

Hersteller: Pepperl + Fuchs GmbH

Anschrift: Lilienthalstrasse 200, 68307 Mannheim, Deutschland

Die Kennzeichnung des Trennschaltverstärkers Typ K*A*-SR*-Ex*.W.* lautet zukünftig:

Ⓔx **II (1) G [Ex ia] IIC bzw.** Ⓔx **II (1) D [Ex ia] IIIC**

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Angewandte Normen

EN 60079-0:2009, EN 60079-11:2007, EN 61241-11:2006

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

Bewertungs- und Prüfbericht: PTB Ex 11-29156

Zertifizierungssektor Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, 27. Mai 2011

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(Translation)

Equipment: Isolation and Switching Amplifier type K*A*-SR*-Ex*.W.*

Marking: Ⓔx **II (1) G D [EEx ia] IIC**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87, 68307 Mannheim, Germany

Description of supplements and modifications

The isolation and switching amplifier, type K*A*-SR*-Ex*.W.* has been technically revised. In the future it may also be manufactured and operated in accordance with the test documents listed in test report PTB Ex 11-29156.

The modifications concern the address of the manufacturer, the standards applied, the marking, the internal construction as well as the enclosure.

The "Electrical data" as well as all other specifications apply without changes.

The manufacturer´s address changes as follows:

Manufacturer: Pepperl + Fuchs GmbH

Address: Lilienthalstrasse 200, 68307 Mannheim, Germany

In the future the marking of the isolation and switching amplifier, type K*A*-SR*-Ex*.W.* will read:

Ⓔx **II (1) G [Ex ia] IIC** or Ⓔx **II (1) D [Ex ia] IIIC**

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

Applied standards

EN 60079-0:2009, EN 60079-11:2007, EN 61241-11:2006

Assessment and test report: PTB Ex 11-29156

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, May 27, 2011

(signature)

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

2 pages, correct and complete as regards content.
By order:

Dr.-Ing. T. Horn

Braunschweig, August 20, 2012

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. E R G Ä N Z U N G

gemäß Richtlinie 94/9/EG Anhang III Ziffer 6

zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

Gerät:	Trennschaltverstärker Typ KFA*-SR*-Ex*.W.*
Kennzeichnung:	**II (1) G [Ex ia] IIC bzw. II (1) D [Ex ia] IIIC**
Hersteller:	Pepperl+Fuchs GmbH
Anschrift:	Lilienthalstraße 200, 68307 Mannheim, Deutschland

Beschreibung der Ergänzungen und Änderungen

Der Trennschaltverstärker Typ KFA*-SR*-Ex*.W.* wurde technisch überarbeitet und kann zukünftig auch entsprechend den Prüfungsunterlagen des Prüfberichtes PTB Ex 14-24081 gefertigt und betrieben werden.

Die Änderungen betreffen die angewandten Normen, die Kennzeichnung, die Erweiterung der „Elektrischen Daten" um Werte für die Explosionsgruppen I und IIIC sowie den inneren Aufbau.
Trennschaltverstärker vom Typ K**H**A*-SR*-Ex*.W.* (KH = Klemmengehäuse, hoch) werden nicht mehr gebaut.
Alle anderen Angaben gelten unverändert.

Die neue Kennzeichnung lautet:#

II (1) G [Ex ia Ga] IIC bzw. II (1) D [Ex ia Da] IIIC bzw. I (M1) [Ex ia Ma] I

Elektrische Daten

Versorgungsstromkreis.....	**KFA6-SR*-Ex*.W.***
(Klemmen 14 und 15)	230 V AC ±10 % Sicherheitstechnische Maximalspannung: U_m = 253 V AC bzw. **KFA5-SR*-Ex*.W.*** 115 V AC ±10 % Sicherheitstechnische Maximalspannung: U_m = 126,5 V AC bzw. **KFA4-SR*-Ex*.W.*** 100 V AC ±10 % Sicherheitstechnische Maximalspannung: U_m = 110 V AC

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Braunschweig und Berlin

3. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

Ausgangsstromkreise ..... (Klemmen 7, 8, 9 bzw. 10, 11, 12)

Wechselstrom		Gleichstrom	
$U \leq 253$ V	$U \leq 126{,}5$ V	$U \leq 40$ V	$U \leq 130$ V
$I \leq 2$ A	$I \leq 4$ A	$I \leq 2$ A	$I \leq 20$ mA
$S \leq 500$ VA		$P \leq 80$ W	
$\cos\varphi \geq 0{,}7$			

Sicherheitstechnische Maximalspannung: $U_m = 253$ V AC

Eingangsstromkreise ..... (Klemmen 1, 2, 3 bzw. 4, 5, 6)

in Zündschutzart Eigensicherheit Ex ia I/IIA/IIB/IIC/IIIC
bzw. Ex ib I/IIA/IIB/IIC/IIIC

Höchstwerte je Stromkreis:

U_o = 10,6 V
I_o = 19,1 mA
P_o = 51 mW
R_i = 554,4 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	1 H	780 mH	390 mH	97 mH
C_o	90 µF	72 µF	16,2 µF	2,32 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten im eigensicheren Eingangsstromkreis sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	5 mH	3 mH
C_o	5,1 µF	4,4 µF	2,1 µF	590 nF

Bei der Zusammenschaltung beider eigensicherer Eingangsstromkreise ergeben sich folgende Höchstwerte:

U_o = 10,6 V
I_o = 38,2 mA
P_o = 102 mW
R_i = 277,2 Ω
Kennlinie linear
$C_i \approx 0$
$L_i \approx 0$

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3. Ergänzung zur EG-Baumusterprüfbescheinigung PTB 00 ATEX 2081

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	320 mH	195 mH	97 mH	24 mH
C_o	90 µF	72 µF	16,2 µF	2,32 µF

Bei Vorhandensein konzentrierter Kapazitäten und/oder Induktivitäten in den zusammengeschaltenen eigensicheren Eingangsstromkreisen sind die höchstzulässigen äußeren Kapazitäten und Induktivitäten für Stromkreise der nachfolgenden Tabelle zu entnehmen.

Zündschutzart	Ex ia bzw. ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	5 mH	3 mH
C_o	4,8 µF	4,2 µF	2 µF	550 nF

Die eigensicheren Eingangsstromkreise sind von allen weiteren Stromkreisen bis zu einem Scheitelwert der Nennspannung von 375 V sicher galvanisch getrennt.

Angewandte Normen

EN 60079-0:2012, EN 60079-11:2012

Prüfbericht: PTB Ex 14-24081

Konformitätsbewertungsstelle, Sektor Explosionsschutz
Im Auftrag

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, 20. August 2014

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. S U P P L E M E N T

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(Translation)

Equipment: Isolation and switching amplifier, type KFA*-SR*-Ex*.W.*

Marking:  **II (1) G [Ex ia] IIC or II (1) D [Ex ia] IIIC**

Manufacturer: Pepperl+Fuchs GmbH

Address: Lilienthalstraße 200, 68307 Mannheim, Germany

The isolation and switching amplifier of type KFA*-SR*-Ex*.W.* was technically revised. In the future it can also be manufactured and operated according to the test documents listed in test report PTB Ex 14-24081.

The modifications concern the applied standards, the marking, the extension of the "electrical data" by values for explosion groups I and IIIC as well as the internal construction. Iisolation and switching amplifiers of type KHA*-SR*-Ex*.W.* (KH = terminal housing, high) are no longer produced.
All other specifications apply without changes.

The new marking reads:

 **II (1) G [Ex ia Ga] IIC or II (1) D [Ex ia Da] IIIC or I (M1) [Ex ia Ma] I**

Electrical data

Supply circuit ..... (terminals 14 and 15)	**KFA6-SR*-Ex*.W.***
	230 V AC ±10 %
	Safety-related maximum voltage: U_m = 253 V AC
	or
	KFA5-SR*-Ex*.W.*
	115 V AC ±10 %
	Safety-related maximum voltage: U_m = 126,5 V AC
	or
	KFA4-SR*-Ex*.W.*
	100 V AC ±10 %
	Safety-related maximum voltage: U_m = 110 V AC

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Braunschweig und Berlin

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

Output circuits..... alternating current direct current
(terminals 7, 8, 9 or 10, 11, 12)

$U \leq 253$ V	$U \leq 126.5$ V	$U \leq 40$ V	$U \leq 130$ V
$I \leq 2$ A	$I \leq 4$ A	$I \leq 2$ A	$I \leq 20$ mA
$S \leq 500$ VA		$P \leq 80$ W	
$\cos\varphi \geq 0.7$			

Safety-related maximum voltage: $U_m = 253$ V AC

Input circuits ..... type of protection Intrinsic Safety Ex ia IIA/IIB/IIC/IIIC
(terminals 1, 2, 3 or 4, 5, 6) or Ex ib IIA/IIB/IIC/IIIC

Maximum values per circuit:
U_o = 10.6 V
I_o = 19.1 mA
P_o = 51 mW
R_i = 554.4 Ω
linear characteritic
$C_i \approx 0$
$L_i \approx 0$

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	1 H	780 mH	390 mH	97 mH
C_o	90 µF	72 µF	16.2 µF	2.32 µF

With the existence of concentrated capacitances and/or inductances in the intrinsically safe input circuit, the maximum permissible external capacitances and inductances for the circuits shall be taken from the following table.

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	5 mH	3 mH
C_o	5.1 µF	4.4 µF	2.1 µF	590 nF

The following values apply to the interconnection of both intrinsically safe input circuits:

U_o = 10.6 V
I_o = 38.2 mA
P_o = 102 mW
R_i = 277.2 Ω
linear characteritic
$C_i \approx 0$
$L_i \approx 0$

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3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	320 mH	195 mH	97 mH	24 mH
C_o	90 µF	72 µF	16.2 µF	2.32 µF

With the existence of concentrated capacitances and/or inductances in the interconnected intrinsically safe input circuits, the maximum permissible external capacitances and inductances for the circuits shall be taken from the following table.

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
L_o	20 mH	10 mH	5 mH	3 mH
C_o	4.8 µF	4.2 µF	2 µF	550 nF

The intrinsically safe input circuits are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V.

Applied standards

EN 60079-0:2012, EN 60079-11:2012

Test report: PTB Ex 14-24081

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

(signature)

Dr.-Ing. U. Johannsmeyer
Direktor und Professor

Braunschweig, August 20, 2014

3 pages, correct and complete as regards content.
On behalf of PTB:

Dr.-Ing. T. Horn
Regierungsrat

Braunschweig, January 22, 2015

RMA-Formular und Erklärung über Dekontaminierung
RMA-Form and explanation for decontamination

RMA-Nr./ RMA-No.

Die RMA-Nr. bekommen Sie von Ihrem Ansprechpartner im Vertrieb oder Service. Bei Rücksendung eines Altgeräts zur Entsorgung tragen Sie bitte in das Feld der RMA-Nr. "WEEE" ein./ You may obtain the RMA number from your sales or service representative. When returning an old appliance for disposal, please enter "WEEE" in the RMA number box.

Zu diesem Rücksendeschein gehört eine Dekontaminierungserklärung. Die gesetzlichen Vorschriften schreiben vor, dass Sie uns diese Dekontaminierungserklärung ausgefüllt und unterschrieben zurücksenden müssen. Bitte füllen Sie auch diese im Sinne der Gesundheit unserer Mitarbeiter vollständig aus./ This return form includes a decontamination statement. The law requires you to submit this completed and signed decontamination statement to us. Please complete the entire form, also in the interest of our employee health.

Firma/ Company

Firma/ Company	
Straße/ Street	
PLZ, Ort/ Zip, City	
Land/ Country	

Ansprechpartner/ Person in charge

Name/ Name	
Abt./ Dept.	
Tel./ Phone	
E-Mail	

Gerät/ Device	
Anzahl/ Quantity	
Auftragsnr./ Order No.	

Serien-Nr./ Serial No.	
Artikel-Nr./ Item No.	

Grund der Rücksendung/ Reason for return

- ☐ Kalibrierung/ Calibration
- ☐ Modifikation/ Modification
- ☐ Reklamation/ Claim
- ☐ Reparatur/ Repair
- ☐ Elektroaltgerät/ Waste Electrical & Electronic Equipment (WEEE)
- ☐ andere/ other

bitte spezifizieren/ please specify

Ist das Gerät möglicherweise kontaminiert?/ Could the equipment be contaminated?

☐ Nein, da das Gerät nicht mit gesundheitsgefährdenden Stoffen betrieben wurde./ No, because the device was not operated with hazardous substances.

☐ Nein, da das Gerät ordnungsgemäß gereinigt und dekontaminiert wurde./ No, because the device has been properly cleaned and decontaminated.

☐ Ja, kontaminiert mit:/ Yes, contaminated with:

☐ explosiv/ explosive	☐ entzündlich/ flammable	☐ brandfördernd/ oxidizing	☐ komprimierte Gase/ compressed gases	☐ ätzend/ caustic	☐ giftig, Lebensgefahr/ poisonous, risk of death	☐ gesundheitsgefährdend/ harmful to health	☐ gesundheitsschädlich/ health hazard	☐ umweltgefährdend/ environmental hazard

Bitte Sicherheitsdatenblatt beilegen!/ Please enclose safety data sheet!

Das Gerät wurde gespült mit:/ The equipment was purged with:

Diese Erklärung wurde korrekt und vollständig ausgefüllt und von einer dazu befugten Person unterschrieben. Der Versand der (dekontaminierten) Geräte und Komponenten erfolgt gemäß den gesetzlichen Bestimmungen.

This declaration has been filled out correctly and completely, and signed by an authorized person. The dispatch of the (decontaminated) devices and components takes place according to the legal regulations.

Falls die Ware nicht gereinigt, also kontaminiert bei uns eintrifft, muss die Firma Bühler sich vorbehalten, diese durch einen externen Dienstleister reinigen zu lassen und Ihnen dies in Rechnung zu stellen.

Should the goods not arrive clean, but contaminated, Bühler reserves the right, to comission an external service provider to clean the goods and invoice it to your account.

Firmenstempel/ Company Sign

Datum/ Date

rechtsverbindliche Unterschrift/ Legally binding signature

Bühler Technologies GmbH, Harkortstr. 29, D-40880 Ratingen
Tel. +49 (0) 21 02 / 49 89-0, Fax: +49 (0) 21 02 / 49 89-20
E-Mail: service@buehler-technologies.com
Internet: www.buehler-technologies.com

Vermeiden von Veränderung und Beschädigung der einzusendenden Baugruppe

Die Analyse defekter Baugruppen ist ein wesentlicher Bestandteil der Qualitätssicherung der Firma Bühler Technologies GmbH. Um eine aussagekräftige Analyse zu gewährleisten muss die Ware möglichst unverändert untersucht werden. Es dürfen keine Veränderungen oder weitere Beschädigungen auftreten, die Ursachen verdecken oder eine Analyse unmöglich machen.

Umgang mit elektrostatisch sensiblen Baugruppen

Bei elektronischen Baugruppen kann es sich um elektrostatisch sensible Baugruppen handeln. Es ist darauf zu achten, diese Baugruppen ESD-gerecht zu behandeln. Nach Möglichkeit sollten die Baugruppen an einem ESD-gerechten Arbeitsplatz getauscht werden. Ist dies nicht möglich sollten ESD-gerechte Maßnahmen beim Austausch getroffen werden. Der Transport darf nur in ESD-gerechten Behältnissen durchgeführt werden. Die Verpackung der Baugruppen muss ESD-konform sein. Verwenden Sie nach Möglichkeit die Verpackung des Ersatzteils oder wählen Sie selber eine ESD-gerechte Verpackung.

Einbau von Ersatzteilen

Beachten Sie beim Einbau des Ersatzteils die gleichen Vorgaben wie oben beschrieben. Achten Sie auf die ordnungsgemäße Montage des Bauteils und aller Komponenten. Versetzen Sie vor der Inbetriebnahme die Verkabelung wieder in den ursprünglichen Zustand. Fragen Sie im Zweifel beim Hersteller nach weiteren Informationen.

Einsenden von Elektroaltgeräten zur Entsorgung

Wollen Sie ein von Bühler Technologies GmbH stammendes Elektroprodukt zur fachgerechten Entsorgung einsenden, dann tragen Sie bitte in das Feld der RMA-Nr. „WEEE“ ein. Legen Sie dem Altgerät die vollständig ausgefüllte Dekontaminierungserklärung für den Transport von außen sichtbar bei. Weitere Informationen zur Entsorgung von Elektroaltgeräten finden Sie auf der Webseite unseres Unternehmens.

Avoiding alterations and damage to the components to be returned

Analysing defective assemblies is an essential part of quality assurance at Bühler Technologies GmbH. To ensure conclusive analysis the goods must be inspected unaltered, if possible. Modifications or other damages which may hide the cause or render it impossible to analyse are prohibited.

Handling electrostatically conductive components

Electronic assemblies may be sensitive to static electricity. Be sure to handle these assemblies in an ESD-safe manner. Where possible, the assembles should be replaced in an ESD-safe location. If unable to do so, take ESD-safe precautions when replacing these. Must be transported in ESD-safe containers. The packaging of the assemblies must be ESD-safe. If possible, use the packaging of the spare part or use ESD-safe packaging.

Fitting of spare parts

Observe the above specifications when installing the spare part. Ensure the part and all components are properly installed. Return the cables to the original state before putting into service. When in doubt, contact the manufacturer for additional information.

Returning old electrical appliances for disposal

If you wish to return an electrical product from Bühler Technologies GmbH for proper disposal, please enter "WEEE" in the RMA number box. Please attach the fully completed decontamination declaration form for transport to the old appliance so that it is visible from the outside. You can find more information on the disposal of old electrical appliances on our company’s website.

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