

GEMÜ Operating conditions and explosion protection markings of the butterfly valves R471 and R478 with special function X

EN

Technical information

Version 1.0



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1 Standards

The following standards were applied:

- EN IEC 80079-36 authorization 1:2024
- EN IEC 80079-36:2016
- EN IEC 80079-37:2016

2 Operating conditions

The following conditions must be complied with for safe operation of the butterfly valves:

1. If the butterfly valves are operated internally as devices within the meaning of Directive 2014/34/EU, the conditions internally must not exceed the following conditions: Temperature -20 °C to +60 °C, pressure 0.8 bar (abs) to 1.1 bar (abs), oxygen content ≤ 21%.

Conditions outside of this range are no longer within the area of validity of Directive 2014/34/EU.

Very high or low temperatures and/or high pressures or raised oxygen content within the interior of the piping or of the butterfly valves affect the safety-relevant parameters of the occurring substances. If conditions occur internally in the non-atmospheric range, the operator must check for themselves what effect these conditions have on the safety-relevant parameters of the occurring substances and which direct ignition hazards result from them. This type of examination must be carried out case by case following the Machinery Directive or the applicable regulatory codes.

2. The actuation of the butterfly valves themselves does not cause an increase in temperature in correct operation. The maximum surface temperature of the butterfly valves to be considered depends on the maximum temperature of the medium in the piping and the maximum temperature of the respective actuator. The surface temperature of the actuator can be taken from the actuator marking as well as from the supplied operating instructions for this actuator.

The highest of the two values must be assumed as the maximum butterfly valve surface temperature to be considered.

Dependent on the temperature class of the occurring gases or vapours outside of the piping, the maximum temperature of the medium in the pipe or in the butterfly valve must not exceed the following values:

Temperature class of the occurring gases or vapours	Maximum permissible temperature of the medium in the pipe or in the butterfly valve
T6	80 °C
T5	95 °C
T4	130 °C
T3	195 °C
T2	295 °C

3. The glow temperature (minimum ignition temperature of the deposited 5 mm layer of dust) of the occurring dust must be at least 75 K above the maximum surface temperature. The ignition temperature (minimum ignition temperature of the dust cloud) must be at least 1.5 times the maximum surface temperature.
4. When operating within a potentially explosive atmosphere under atmospheric pressure internally, the maximum temperature of the medium in the pipe or in the butterfly valve must not exceed the following values:

Temperature class of the occurring gases or vapours	Maximum permissible temperature of the medium in the pipe or in the butterfly valve
T6	68 °C
T5	80 °C
T4	108 °C
T3	160 °C
T2	240 °C

When operating within a potentially explosive atmosphere under raised pressure internally, the permissible temperatures must be checked case by case, see information 1.

5. The butterfly valves must be included in the potential equalisation of the entire system. The supplied earthing set must be used for this. Observe the instructions in the operating instructions.
6. Dust deposits > 5 mm on the butterfly valves must be prevented with appropriate measures (e.g. regular cleaning).
7. If gases and vapours of explosion group IIC are present, butterfly valves marked with IIB must not be used.
8. If gases and vapours of explosion group IIB or IIC are present, butterfly valves marked with IIA must not be used.
9. The butterfly valves must not have insulating layers with a total thickness of more than 0.2 mm.
10. The butterfly valves must not be used as end-of-line valves.
11. The operating instructions of the mounted actuators must also be observed.

3 Explosion protection markings

Butterfly valve GEMÜ R471 with pneumatic actuators

R471 with actuator GDR or GSR

Nominal size	Explosion protection marking with actuator
50–250	Ex II 2G Ex h IIC T6...T2 Gb X Ex II -/2 Ex h IIIC T85 °C...230 °C Db X -10 °C ≤ Ta ≤ +40 °C
300–600	Ex II -/2 G Ex h -/IIC T6...T2 -/Gb X Ex II -/2 D Ex h -/IIIC T85 °C...230 °C -/Db X -10 °C ≤ Ta ≤ +40 °C

R471 with actuator DR or SC

Nominal size	Explosion protection marking with actuator
50–250	Ex II 2G Ex h IIC T6...T2 Gb X Ex II -/2 Ex h IIIC T85 °C...230 °C Db X -10 °C ≤ Ta ≤ +60 °C
300–600	Ex II -/2 G Ex h -/IIC T6...T2 -/Gb X Ex II -/2 D Ex h -/IIIC T85 °C...230 °C -/Db X -10 °C ≤ Ta ≤ +60 °C

Butterfly valve GEMÜ R478 with motorized actuators

R478 with actuator PF

Nominal size	Explosion protection marking with actuator
50–250	Ex II 2G Ex h IIC T4...T2 Gb X Ex II -/2 Ex h IIIC T130 °C...230 °C Db X -10 °C ≤ Ta ≤ +60 °C
300–600	Ex II -/2 G Ex h -/IIC T4...T2 -/Gb X Ex II -/2 D Ex h -/IIIC T130 °C...230 °C -/Db X -10 °C ≤ Ta ≤ +60 °C

4 Explanations concerning the marking

Each explosion protection marking is composed according to the same principle. It is provided as a marking for gases and for dust. The explanations of the respective information are in the table below:

Application	Gas	Dust	Explanations
Ex marking			
Equipment group	II	II	Not suitable for mining
Equipment category	2	2	Equipment category 2/: Devices that ensure a high level of safety, suitable for zone 1 (internal) Equipment category 2/: Devices that ensure a high level of safety, suitable for zone 1 or 21 (external)
Danger of explosion	G	D	D: Danger of explosion due to combustible dust G: Danger of explosion due to combustible gases and vapours
Type of explosion protection	Ex h	Ex h	Non-electrical explosion protection
Suitable for	IIB / IIC	IIIC	IIIC: Suitable for electrically conductive dusts in Group IIIC (includes IIIA and IIIB) IIC: Suitable for gases and vapours in Group IIC (includes IIA and IIB) IIB: Suitable for gases and vapours in Group IIB (includes IIA) Specification of the explosion group, internal/external: Same as equipment category
Temperature class	T6 to T2		Temperature class dependent on the maximum media temperature and the temperature class of the respective actuator.
Max. surface temperature		T85 °C to 230 °C	Maximum surface temperature, dependent on the maximum media temperature and the maximum temperature of the respective actuator.
Equipment protection level	Gb	Da/Db	Equipment protection level internal/external, analogous to the equipment category
Perm. ambient temperature	-20 °C ≤ Ta ≤ +60 °C or -15 °C ≤ Ta ≤ +60 °C	-20 °C ≤ Ta ≤ +60 °C or -15 °C ≤ Ta ≤ +60 °C	Permissible ambient temperature

5 EU Declaration of Conformity

Version 1



EU-Konformitätserklärung
EU Declaration of Conformity

Wir, die Firma

We, the company

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erklären hiermit in alleiniger Verantwortung, dass die nachfolgend bezeichneten Produkte den Vorschriften der genannten Richtlinien entspricht.

hereby declare under our sole responsibility that the below-mentioned products complies with the regulations of the mentioned Directives.

Produkt: GEMÜ Absperrklappen
Produktname: Pneumatisch und elektromotorisch betätigte Absperrklappen
Produktvarianten: R471, R478, mit Sonderausführung Code X

Product: GEMÜ Butterfly valves
Product name: Pneumatically operated and motorized butterfly valves
Product versions: R471, R478, with special version Code X

Richtlinien/Verordnungen:

Directives/Regulations:

ATEX 2014/34/EU¹⁾

Folgende harmonisierte Normen (oder Teile hieraus) wurden angewandt:

The following harmonized standards (or parts thereof) have been applied:

EN IEC 80079-36 Berichtigung 1:2024; EN IEC 80079-36:2016; EN IEC 80079-37:2016

¹⁾ ATEX 2014/34/EU

Bemerkungen:

Besondere Bedingungen oder Einsatzgrenzen, siehe Dokument "GEMÜ Einsatzbedingungen und Explosionsschutzkennzeichnungen der Absperrklappen R471 und R478 mit Sonderfunktion X".

Explosionsschutzkennung:

Siehe Dokument "GEMÜ Einsatzbedingungen und Explosionsschutzkennzeichnungen der Absperrklappen R471 und R478 mit Sonderfunktion X" und die zugehörigen Betriebsanleitungen.

¹⁾ ATEX 2014/34/EU

Remarks:

Special conditions or operational limits, see document "GEMÜ Operating conditions and explosion protection markings of the butterfly valves R471 and R478 with special function X".

Explosion protection designation:

See document "GEMÜ Operating conditions and explosion protection markings of the butterfly valves R471 and R478 with special function X" and the associated operating instructions.

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Kupferzell, 14.07.2026

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