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1. Information on This Operating Instruction

- The manual is aimed at specialists and semi-skilled personnel.
- Please read the instructions carefully before carrying out any operation and keep the specified order.
- Thoroughly read and understand the information in chapter 2 "Safety Instructions".

If you have any problems or questions, please contact your supplier or contact us directly at:



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Operating Instructions

Flame Arrester Model "Adapt FS"

1.1 Pictographs Used

In this manual, pictographs are used as hazard warnings.

Particular information, instructions and restrictions designed for the prevention of personal or substantial property damage:



WARNING! Is used to warn you against an imminent danger that may result in personal injury or death.

IMPORTANT! Is used to warn you against a possibly hazardous situation that may result in personal, property or environmental damage.

CAUTION! Is used to draw your attention to important recommendations to be observed. Disregarding them may result in property damage.



Passages in the text containing **explanations, information or advice** are highlighted with this pictograph.



The following symbol highlights **actions** you have to conduct or **instructions** that have to be strictly observed.

1.2 Exclusion of Liability

We accept no liability for any damage or malfunction resulting from incorrect installation, inappropriate use of the device or failure to follow the instructions in this manual.

1.3 General Information

Please inspect the transport packaging and the delivered items immediately upon their receipt to determine their integrity and completeness. You have purchased an instrument that was manufactured according to high quality standards in our company, which is certified according to DIN EN ISO 9001.

Thus, the protection system described in the following is designed and manufactured according to latest knowledge and is subject to strict quality criteria.

Should a reason for complaint however arise, please return the device to our factory with a detailed description of faults.

2. Safety Instructions

Please read this operating instruction thoroughly before installing the device.

Disregarding the containing warnings, especially the safety instructions, may result in danger for people, the environment, and the device and the system it is connected to.

The ARMANO Messtechnik GmbH provides support for the use of its products either personally or via relevant literature. The customer verifies that our product is fit for purpose based on our technical information. The customer performs customer and application specific tests to ensure that the product is suitable for the intended use. With this verification, all hazards and risks are transferred to our customers. Our warranty expires in case of inappropriate use.

Qualified personnel:

The personnel that is charged for the installation, operation and maintenance of the device must hold a relevant qualification. This can be based on training or relevant tuition. The personnel must be aware of this manual and have access to it at all times.

General safety instructions:

- In all work, the existing national regulations for accident prevention and safety at the workplace must be complied with. Any internal regulations of the operator must also be complied with, even if these are not mentioned in this manual.
- Please regard relevant national and international safety instructions (ATEX 137, ExVo, BetrSichV etc.).
- Please do never manipulate the device! Otherwise, you will lose your warranty!
- Repairs may only be carried out by the manufacturer.

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- Use the instrument in its perfect technical condition only. Damaged or defective instruments need to be checked immediately and replaced if necessary.
- Only use appropriate tools for mounting, connecting and dismounting the device.
- Nameplates or other information on the device shall neither be removed nor obliterated, since otherwise any warranty and manufacturer responsibility expires.



IMPORTANT! Disregarding the respective regulations may result in severe personal injuries and / or property damage.



Special safety instructions:

Warnings, which are specifically relevant to individual operating procedures or activities, are to be found at the beginning of the relevant sections of this operating instruction.

3. Description of the Protection System

The flame arrester model Adapt FS (⇒ see chapter 11 "Variants and Installation Options") avoids flame penetration in case of deflagrations of potentially explosive vapour-air and gas-air mixtures of explosion groups IIA, IIB and IIC in an upstreamed volume (e.g. pressure measuring instruments, chemical seals).

The protection consists of a welded stainless steel cannula as flame arrester. The vapour-air or gas-air mixtures can flow through the cannula with a maximum internal diameter of 0.6 mm (0.024") and a minimum length of 23 mm (0.91"), yet a flame penetration is prevented.

4. Requirements of the Explosion Protection

Flameproof in case of deflagration of flammable gases and liquids according to EU type examination certificate PTB 12 ATEX 4001 X.

5. EU Type Examination Certificate / Approval

The flame arrester model Adapt FS as non-electrical equipment for potentially explosive areas, corresponds to the harmonised standard

DIN EN ISO 16852:2017 "Flame Arrester".

The flame arrester model Adapt FS complies with explosion protection class

II G IIC

and meets the requirements to the explosion protection, as described in chapter 4.

6. Marking



Flame arresters are subject to installation and application limitations
Classification according to
DIN EN ISO 16852:2017

| | | | | |
|------|-------------|----------------------|-------------------------|----------------------|
| VDEF | $L_v/D=n/a$ | BC:c | | |
| | Ex G IIC | $T_o = 60\text{ °C}$ | $P_o = 0.11\text{ MPa}$ | $V_o = 0.2\text{ l}$ |

| | | |
|----------|---|--|
| VDEF | = | pre-volume flame arrester |
| L_v/D | = | ratio of pipe length of the unprotected side to pipe diameter |
| BC:c | = | categorisation under stabilised burning, classification c (no combustion time) |
| Ex G IIC | = | explosion group |
| T_o | = | max. operating temperature |
| P_o | = | max. operating pressure |
| V_o | = | max. volume of the unprotected side |

Operating Instructions

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The following marking according to ATEX 2014/34/EU is carried out at an appropriate position on the device:



Please note the documentation!

With the marking IIG, they can be used in areas, which might be at risk from potentially explosive gas-air mixtures, except for underground and surface parts of mines.

They meet the requirements for gas mixtures of explosion group IIC (maximum experimental safe gap ≥ 0.3 mm).

The protected side of the screwed adapter is additionally marked with a dot.

7. Special Conditions for the Safe Use

For the safe use of the flame arrester model "Adapt FS", the following conditions have to be complied with:

- The unprotected volume must not be larger than 0.2 litres.
- At the screwed adapter, the maximum piping length on the non-protected side between a potential ignition source and the flame arrester must not be larger than $3 \times D = 45$ mm.
- The nominal width of the connection on the non-protected side shall be max. G $\frac{1}{2}$ " or DN 15.
- The nominal width of the connection on the protected side shall be max. G $\frac{1}{2}$ " or DN 15.
- The inflammable gases and vapours occurring during operation may form part of explosion group IIC with a maximum experimental safe gap of ≥ 0.3 mm.
- The maximum permissible operating pressure must not exceed 110 kPa.

- The maximum operating temperature is 60 °C.
- In order to fulfil the requirements of the zone separation, the technical tightness of the connection between process connection of the measuring instrument and process connection piece on the machine side has to be ensured. The connection has to be secured against unintentional loosening. The plant operator is responsible for taking the necessary measures.

8. Mounting

The mounting of flame arresters or measuring instruments with integrated flame arresters shall be carried out by qualified personnel only.

The connections have to be tight.

For this, appropriate national and international safety regulations (\Rightarrow chapter 2 "Safety Instructions") have to be regarded.

Sealings have to be used, which are suitable for the connections and made of material resistant to the medium.

For sealing pressure measuring connections with cylindrical thread spigot, e.g. flat sealings according to DIN EN 837-1, profile packings or lens-type sealing rings for corresponding high pressure connections have to be inserted at the sealing face.

Operating Instructions

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9. Maintenance / Cleaning, Storage and Transport



CAUTION! Material damage and loss of warranty!

Any modifications or interventions in the device, made by the customer, might damage important parts or components. Such intervention leads to the loss of any warranty and manufacturer's responsibility!

→ Never modify the device or perform any repairs yourself.

Maintenance:

Flame arrester models Adapt FS are generally maintenance-free. Any arising repairs may only be executed by the manufacturer.



Any modification of the Adapt FS terminates its type approval.

Any modification of instruments with integrated Adapt FS terminates the manufacturer's declaration.

Before returning an instrument for repair, the wetted parts must be cleaned thoroughly, especially when using hazardous media.

The repair order should include a description of the medium or a declaration of contamination.

Cleaning:

- Clean the device with a dry or slightly dampened soft cloth.
- Do not use any sharp objects or aggressive agents for cleaning.

Storage and transport:

- Use the original packaging or comparable packaging for storage / for transport.
- Avoid impacts or strong vibrations.
- Protect the device against damage caused by external influences.

Please contact the manufacturer in case of uncertainties.

10. Dismounting and Disposal



WARNING! Risk of injury!

Never remove the device from a system in operation.

Make sure that the system is switched off professionally.

Before dismounting:

Check before dismounting, whether the system

- is switched off,
- is in a safe and currentless state,
- is unpressurised and cooled down.

Disposal:

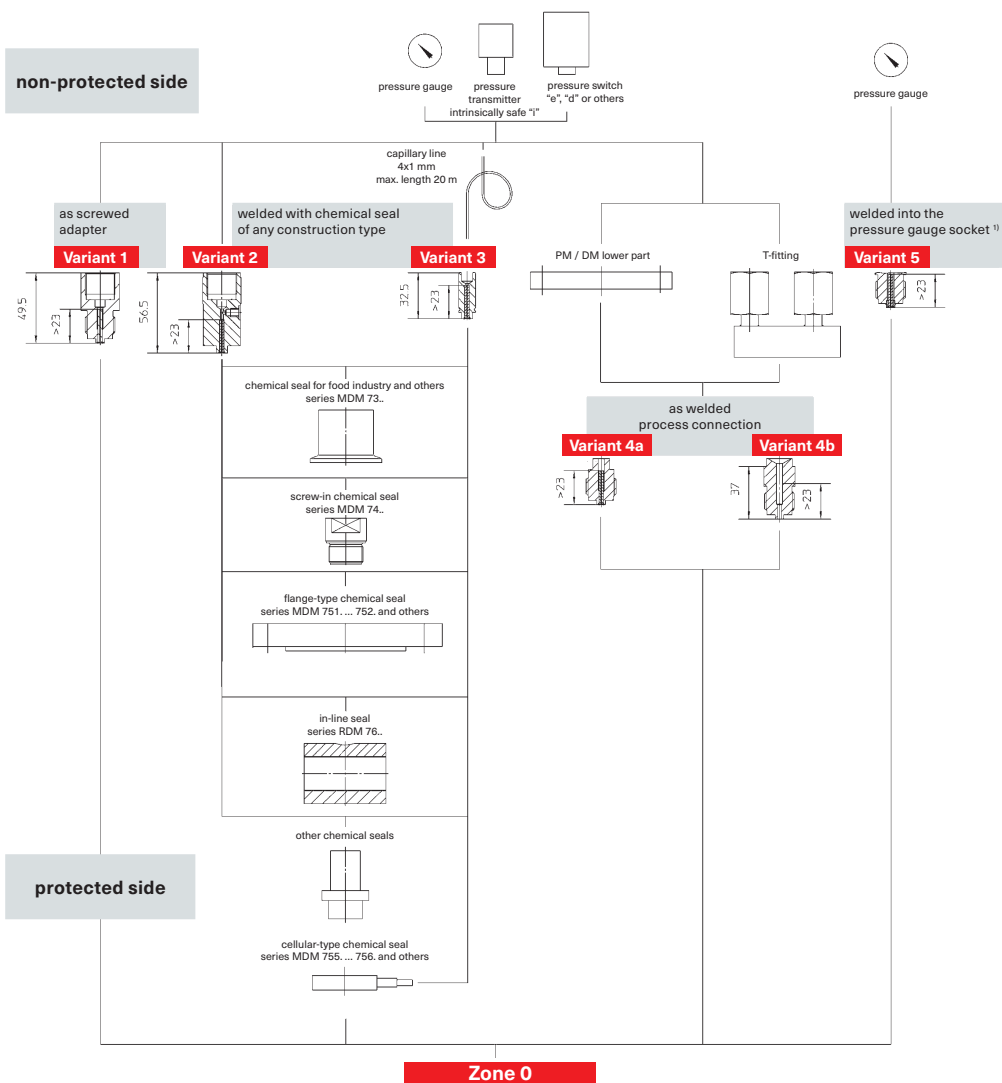


Please help us protect our environment and dispose of or recycle the used materials according to the respective and valid regulations.

Operating Instructions Flame Arrester Model "Adapt FS"

11. Variants and Installation Options

Pressure Measuring Instruments



¹⁾ for process connection G ½ B and M20x1.5, others upon request

12. Declaration of Conformity

EU-Konformitätserklärung

EU Declaration of Conformity

Für die nachfolgend bezeichneten Erzeugnisse

We hereby declare for the following named goods

DEFLAGRATIONSOLUMENSICHERUNG
Typ Adapt FS

FLAME ARRESTERS
Model Adapt FS

wird hiermit bestätigt, dass sie den wesentlichen Schutzanforderungen entsprechen, die in den Richtlinien des Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten festgelegt sind.

that they meet the essential protective requirements, which have been fixed in the Directive of the European Parliament and the Council on the approximation of the laws of the Member States.

Zur Beurteilung der Erzeugnisse hinsichtlich der Anforderungen nach den Richtlinien 2014/34/EU (ATEX), folgende Normen herangezogen:

The following standards have been used to assess the goods regarding the requirements of the directives 2014/34/EU (ATEX):

DIN EN ISO 16852: 2017-04

Kennzeichnung:
II G IIC

Marking:
II G IIC

Für die Funktion dieses Produktes als Deflagrationsvolumensicherung müssen die im Anhang der Baumusterprüfbescheinigung **PTB 12 ATEX 4001 X** unter Pkt. (17) aufgeführten besonderen Bedingungen eingehalten werden.

For using this product as flame arrester, the special conditions listed in the annex to the EU-Type Examination Certificate **PTB 12 ATEX 4001 X** item (17) have to be observed.

Wird die Deflagrationsvolumensicherung außerhalb der dort aufgeführten atmosphärischen Bedingungen betrieben, hat dieses Produkt keine Funktion. Es kann hinsichtlich Druck und üblicher Betriebstemperatur nicht beschädigt werden.

When using the flame arrester outside the atmospheric conditions listed there, this product has no function. By pressure and usual operating temperature it cannot be damaged.

Benannte Stelle für EU-Baumusterprüfbescheinigung:
Physikalisch-Technische Bundesanstalt (PTB)
Kennnummer: **0102**

Notified body for EU-Type Examination:
Physikalisch-Technische Bundesanstalt (PTB)
Identification Number: **0102**

EU-Baumusterprüfbescheinigung:

EU-Type Examination Certificate:

PTB 12 ATEX 4001 X

021 EU-Konformitätserklärung Adapt FS, Aug. 04/21

Diese Erklärung wird verantwortlich für den Hersteller:
This declaration is issued under the sole responsibility of the manufacturer:

ARMANO Messtechnik GmbH
abgegeben durch/by
Grünhain-Beierfeld, 2021-04-14

Bernd Vetter
Geschäftsführender Gesellschafter / Managing Director

ARMANO

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Flame Arrester Model "Adapt FS"



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