

# Operating instructions

## FR90 fire dampers

- FR92 series -

FR90 fire dampers are shut-off devices against fire and smoke in buildings with ventilation and air conditioning systems. As safety devices, fire dampers are subject to regulations, in particular, governing their installation, operation and servicing. These should be observed by the operator!

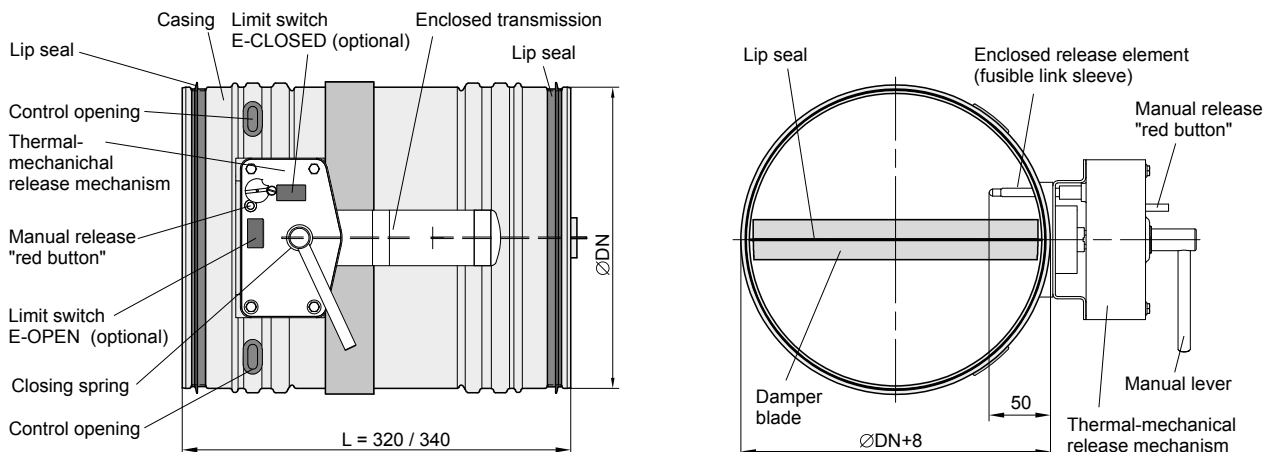


Fig. 1: FR90 fire damper

All dimensions in [mm]

DN = 100 mm to 800 mm

### Installation

The manufacturer's specifications must be followed for correctly installing the fire dampers, in particular, the corresponding user manuals and relevant regulations. These operating instructions require correct installation of the fire dampers!

### Function

FR90 fire dampers are given release mechanisms for a nominal temperature of 70°C or 95°C. When triggered, the fire dampers must close and lock automatically.

### Commissioning

The damper blade of the fire damper must be open. The release elements and safety fuses are required to be intact. Then the fire damper remains open. The fire damper may be equipped with different release mechanisms and with electric spring return actuators for opening and closing. Commissioning is described below.

### Functional check

The damper blade of the fire damper must be closed. To perform functional checks, activate the damper either manually or via remote control, if present.

6-month checks of fire damper functionality are mandatory in Germany. If successive tests are passed without any defects, the next test may be carried out after one

year. Relevant regulations and standards should be followed.

### Operation + servicing

Operation of the fire damper is only permitted if it is in perfect condition. There must be no damage, significant contamination or other circumstances that could interfere with operation. Inhibitory soiling inside the fire damper casing must be eliminated.

### Repairs

Defects on the fire damper must be rectified immediately. Defective components may be replaced with original factory spare parts. Other repairs should be coordinated with the manufacturer of the fire dampers. Sufficient expertise is required!

### Electric components

FR90 fire dampers can contain electrically connected components! Necessary safety measures must be followed!

### Explosion-protected

FR90 fire dampers may only be used in building areas where hazardous explosive atmospheres may occur during normal operation. However, the fire dampers must be suitably equipped for this purpose. See information below!

Addition to:

## FR90 fire dampers with thermal-mechanical release mechanism

### Function

FR90 fire dampers with thermal-mechanical **release mechanism** (Fig. 2) are closed by spring force:

- after a break in the fusible link sleeve or
- by manual release, by pressing the 'red button'.

The same effect as manual release can be produced by a **remote release that can be integrated**. The designs with:

- **magnetic clamp** (Fig. 3a) activate the 'red button' when the electrical supply voltage is interrupted.
- **lifting solenoid** (Fig. 3a) or with **lift cylinder** (Fig. 3b) activate the 'red button' after an electrical impulse activates the magnet or compressed air activates the compressed air cylinder.

Mechanical release mechanisms can be equipped with pluggable electrical **limit switches** (Fig. 2) for operating positions CLOSED and/or OPEN.

These limit switches and remote releases must not be used in potentially explosive atmospheres!

Fire dampers with mechanical release mechanism and **explosion-protected limit switches** (Fig. 4) can be used in building areas where hazardous **explosive atmospheres** might occur in normal operation.

### Commissioning

Turn the hand lever anticlockwise, thus moving the damper blade to the OPEN position. The release mechanism must be locked within the casing and then the damper blade is locked in the enclosed slider crank drive of the fire damper.

### Remote release

The electrical operating voltage or the compressed air must correspond to the specifications on the rating plates. A requirement for commissioning the fire damper is that the fusible link sleeve (Fig. 5) of the release mechanism (Fig. 1) be intact. For remote releases:

- Operating voltage must be connected to WU220 or GU24.
- No operating voltage may be connected to W220 or G24.

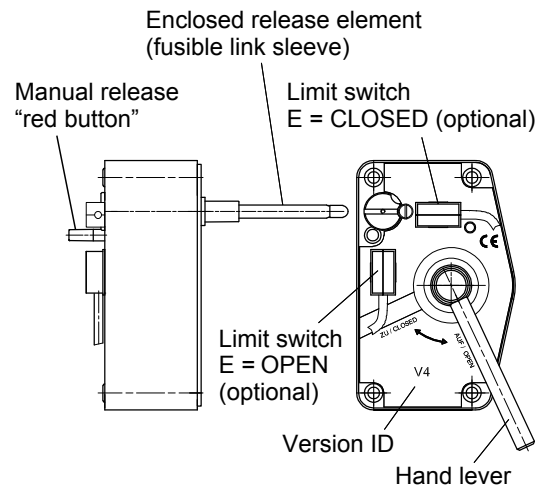
The anchor plate has to be pulled with the key ring against the pressure springs on the magnets, which then sticks and releases the 'red button'.

- Compressed may not be connected to P or P2.

Fig. 2: **Thermal-mechanical release mechanism**

**These release mechanisms have a version ID!**

Release mechanisms with the same ID must be used when changing them!



### Functional check

At least one release and then proper closing of the fire damper must occur.

- The 'red button' must be pressed for **manual** release. The release mechanism then unlocks and the fire damper must close. If there is remote release, the easiest way to manually activate 'red button' is with a screwdriver (Fig. 3C) or a pin  $\varnothing \leq 3.5$  mm.
- For **remote** release with
  - **magnetic clamp** (Fig. 3a): the electric voltage must be interrupted.
  - **lifting solenoid** (Fig. 3a): an electrical impulse is required.
  - **lift cylinder** (Fig. 3b) compressed air is required. The "red button" should always be pressed!

**Important!** The force of the spring(s) in the release mechanism is released during triggering. The hand lever very quickly turns through 90 degrees as a result!

The CLOSED position has to be reached. The fire damper is then closed and the damper blade is locked.

To open the fire damper again, proceed as described under "**Commissioning**".

**Fig. 3: Thermal-mechanical release mechanisms**  
 additionally with electromagnetic and pneumatic remote release mechanisms

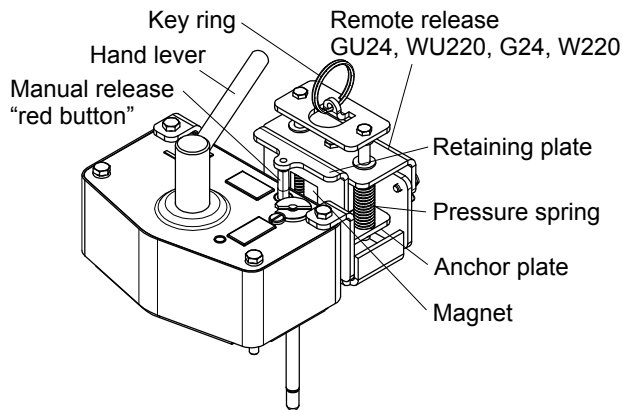


Fig. 3a

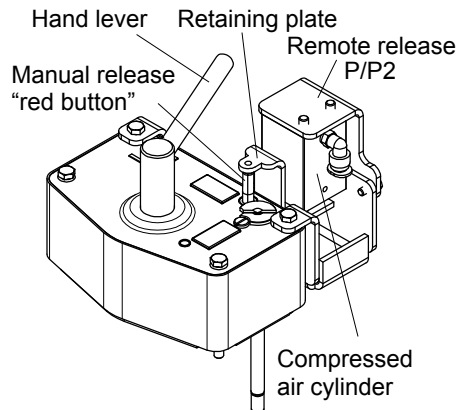


Fig. 3b

The easiest way to activate the 'red button' is with a screwdriver!

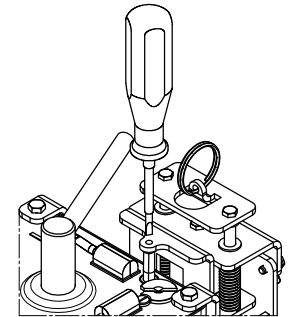
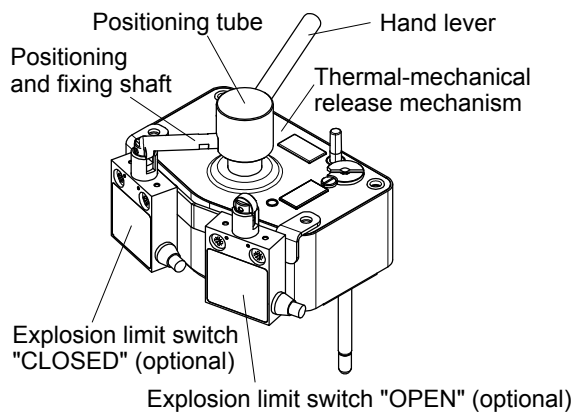
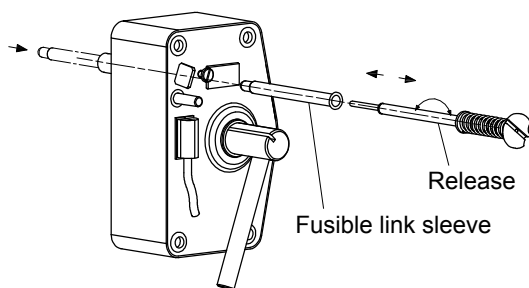


Fig. 3c

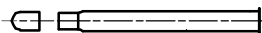
**Fig. 4: Thermal-mechanical release mechanism**  
 with electrical explosion-protected limit switches



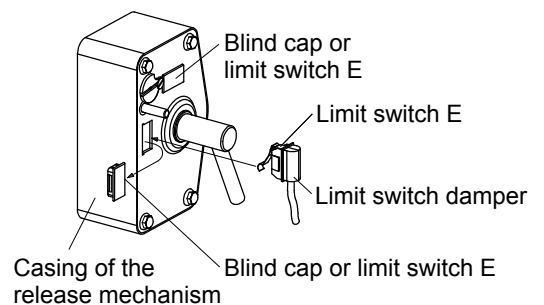
**Fig. 5: Replacement of fusible link sleeve**  
 The 'release' must also be replaced at the same time!



Fusible link sleeve intact: 

Fusible link sleeve released: 

**Fig. 6: Replacement of limit switches E**



Version	Design	Surface identifier
70°C	without coating	Brass or tin-plated
70°C-Korro	with anti-corrosion coating	black
95°C-Korro		red

Addition to:

## FR90 fire damper with electric spring return actuators and thermal-electrical release mechanism



### Safety information!

In the de-energised state, electrical spring return actuators are to be opened manually using a crank handle and fixed in any position! The thermal-electrical release mechanism is then inoperative. The fire damper then remains open in the case of fire.

In order to ensure fire protection, the unlocking device must be manually disconnected! This occurs automatically by connecting the power supply.

**IMPORTANT:** Only when the power supply is connected is functionality of the fire damper and release mechanism guaranteed.

### Function

FR90 fire dampers with electric spring return actuators are closed by the spring force:

- following a break in the release element or the safety fuse(s) in the release mechanism or in the test switch, and
- following a break in the power supply.
- when the fire damper is fitted with an operation unit according to:
  - Fig. 7 to Fig. 11 - after an interruption in the electric plug connection on the spring return actuator.
  - Fig. 9 to Fig. 12 - after actuation of the button on the release mechanism.
  - Fig. 13 and Fig. 14 - after turning the test switch to position 0.
  - Fig. 15 to Fig. 17 - after actuation of the toggle switch/push button switch on the release mechanism.

### Commissioning

The release mechanism and the fuse(s) are required to be intact and the power supply to be connected. In addition, in the case of operation unit, according to:

- Fig. 7 to Fig. 11 - the plug connection of the release mechanism must be with the spring return actuator.
- Fig. 9 to Fig. 12 - the button must not be actuated.

- Fig. 13 and Fig. 14 - the test switch on the spring return actuator must be in position I.
- Fig. 15 to Fig. 17 - the toggle switch/push button switch must be in the OPEN position.

The electrical circuit is then closed so that the spring return actuator opens the damper blade.

The position indicators of the spring return actuators show operating positions OPEN and CLOSED. External indicators are possible via the limit switches of the spring return actuators.

### Functional check

During a functional check, at least one complete closing and reopening of the damper blade must be carried out.

Manually, with operation units, according to:

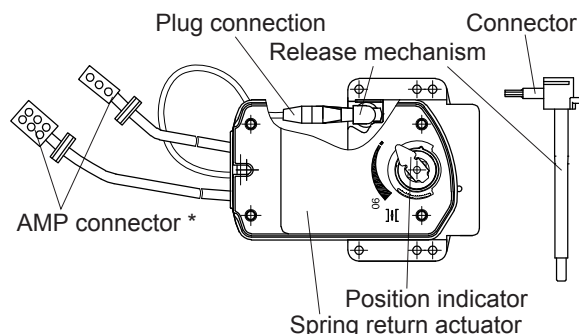
- Fig. 7 and Fig. 8 - the electric plug connection on the spring return actuator should be temporarily disconnected.
- Fig. 9 to Fig. 12 - the button should be actuated and, if necessary, temporarily held.
- Fig. 13 and Fig. 14 - the test switch on the spring return actuator must be put in position 0.
- Fig. 15 to Fig. 17 - the toggle switch/push button switch must be put in the CLOSED position.

The damper blade can also be remotely closed and re-opened. The limit switches must be electrically connected to remotely indicate the damper blade positions CLOSED and OPEN.

The operating voltage is always interrupted. The damper blade of the fire damper must close and the CLOSED position must be fully reached.

To open the fire damper again, proceed as described under "**Commissioning**".

Fig. 7: Operation units M220-9/V and M24-9/V with spring return actuators B7622.020.230-01 and B7622.020.024-01

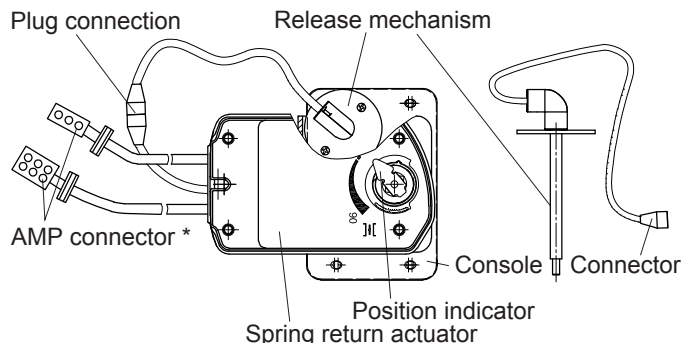


The spring return actuators should be installed in the horizontal position on the fire damper.

### Release mechanisms:

- V 70°C with white connector
- V 95°C with red connector

Fig. 8: Operation units M220-9 (D) and M24-9 (D) with spring return actuators B7622.020.230-01 and B7622.020.024-01



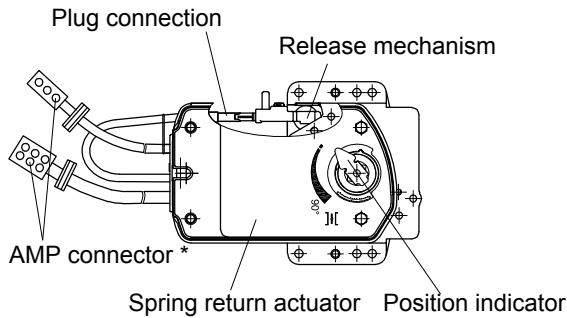
The spring return actuators should be installed in the horizontal position on the fire damper. Spring return actuators on the operation units M220-9 D and M24-9 D can be turned into a suspended position on site!

### Release mechanisms:

- ST 1.72WI: 70°C with yellow marking
- ST 1.90WI: 95°C with red marking

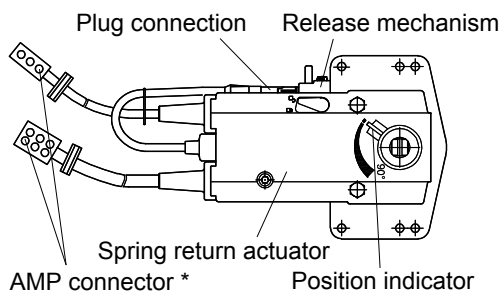
\* AMP connectors can be removed if they are not being used.

Fig. 9: **Operation unit M220-9/H and M24-9/H**  
with spring return actuators B7622.020.230-02 and B7622.020.024-02



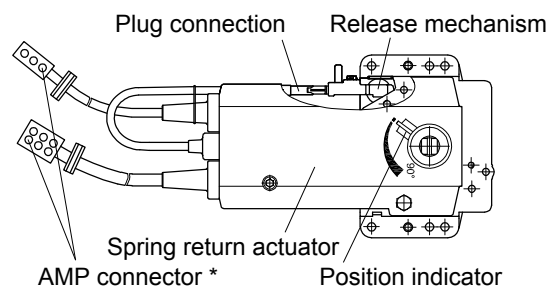
The spring return actuators should be installed in the illustrated position on the fire damper.

Fig. 10: **Operation units M220-10/F and M24-10/F**  
with spring return actuators B7622.021.230-01 and B7622.021.024-01  
for the sizes DN ≤ 315 mm



The spring return actuators should be installed in the illustrated position on the fire damper.

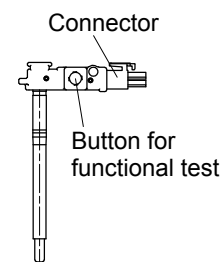
Fig. 11: **Operation units M220-11/H and M24-11/H** with spring  
return actuators B7622.022.230-01 and B7622.022.024-01



The spring return actuators should be installed in the illustrated position on the fire damper.  
They can be rotated into a suspended position on site!

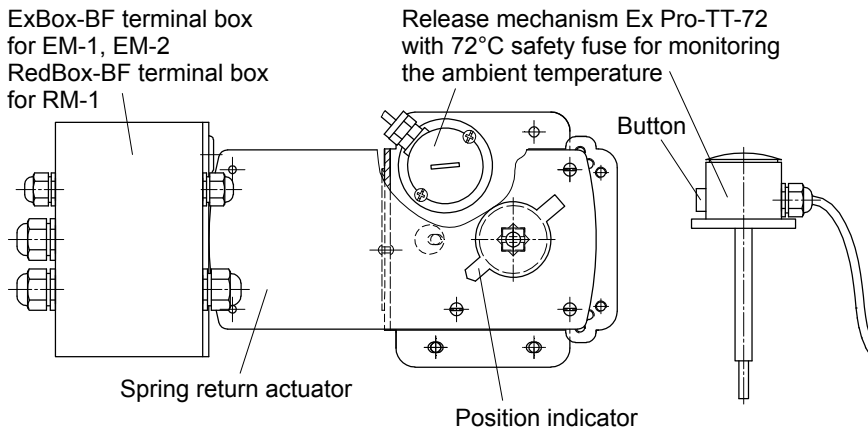
**Release mechanisms for the operation units  
M220-9/H, M24-9/H,  
M220-10/F, M24-10/F,  
M220-11/H, M24-11/H:**

- 70°C-2S with white connector
- 95°C-2S with red connector



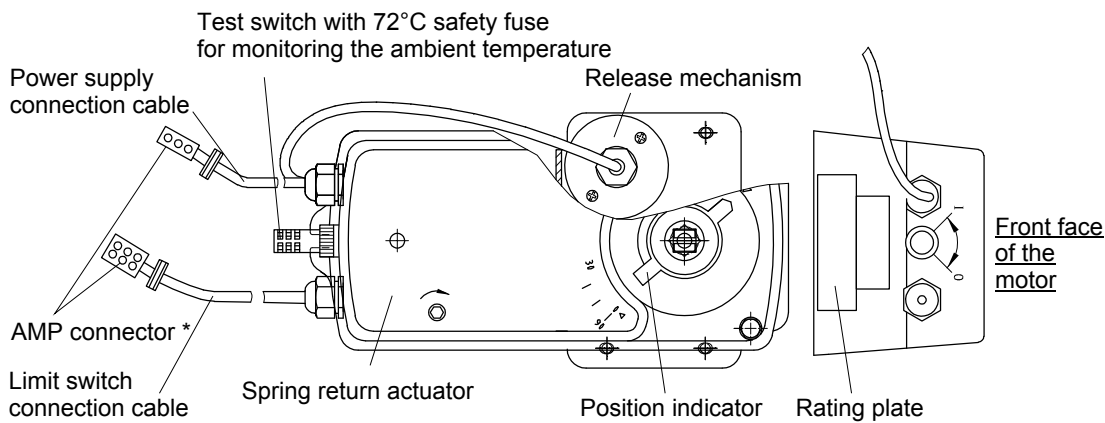
\* AMP connectors can be removed if they are not being used.

**Fig. 12: Operation units EM-1, EM-2 and RM-1**  
with spring return actuators Ex-Max 5.10-BF, Ex-Max 15-BF and Red-Max 5.10-BF



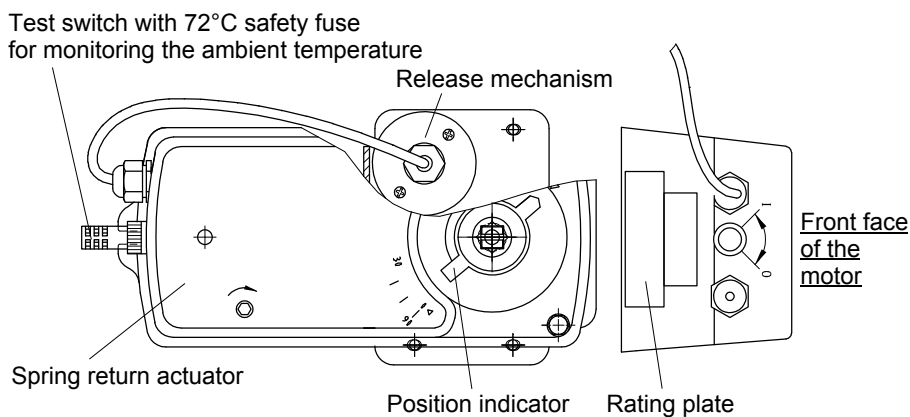
The spring return actuators should be installed in the horizontal position on the fire damper. They can be rotated into a suspended and a vertical position on site!

**Fig. 13: Operation units M220-3 and M24-3**  
with spring return actuators SFR 2.90 - 1T/12/T-WI and SFR 1.90 - 1T/12/T-WI



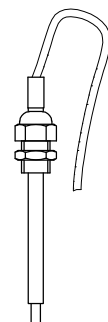
The spring return actuators should be installed in the horizontal position on the fire damper. They can be rotated into a suspended and a vertical position on site!

**Fig. 14: Operation unit M24-2**  
with spring return actuator SFR 1.90T SLC



**Release mechanisms** for the operation units M220-3, M24-3 and M24-2:

- ST 1.72N: 72°C
- ST 1.90N: 90°C

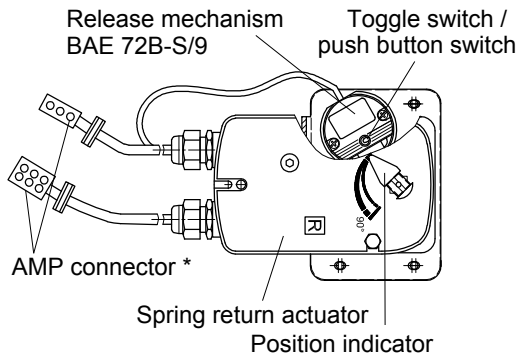


The spring return actuators should be installed in the horizontal position on the fire damper. They can be rotated into a suspended and a vertical position on site!

\* AMP connectors can be removed if they are not being used.

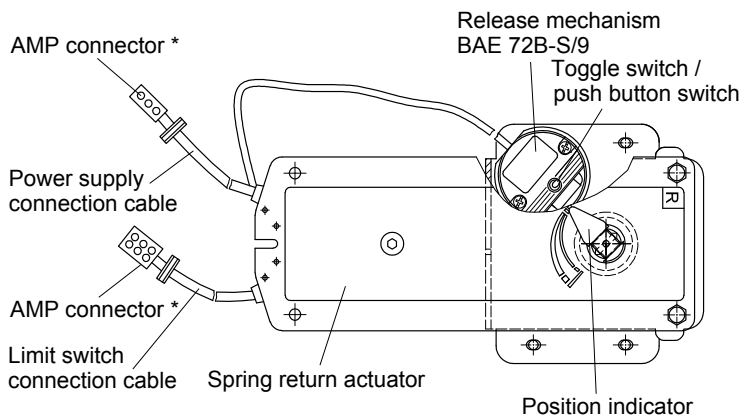


Fig. 15: **Operation units M220-7 (D) and M24-7 (D)**  
with spring return actuators BLF230T-ST-WI and BLF24T-ST-WI



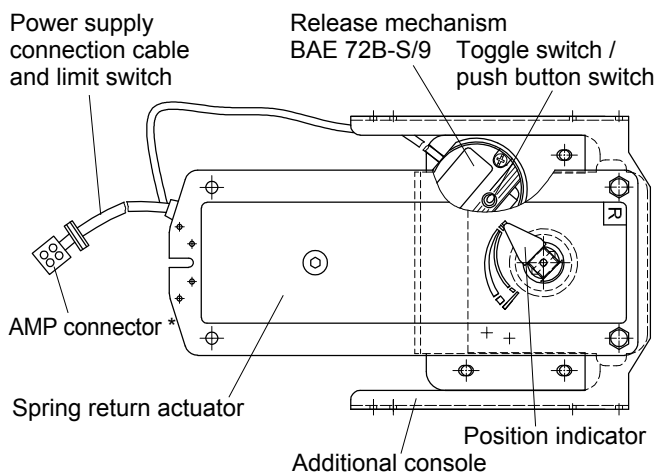
The spring return actuators should be installed in the horizontal position on the fire damper. Spring return actuators on the operation units M220-7 D and M24-7 D can be rotated into a suspended and into a vertical position on site!

Fig. 16: **Operation unit M220-4 and M24-4**  
with spring return actuators BF230T-ST-WI and BF24T-ST-WI



The spring return actuators should be installed in the horizontal position on the fire damper. They can be rotated into a suspended and a vertical position on site!

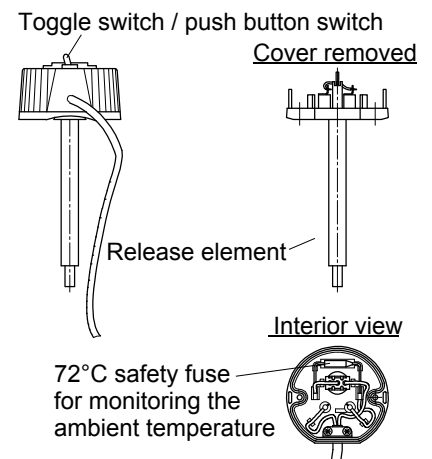
Fig. 17: **Operation unit M24-8**  
with spring return actuator BF24TL-T-ST



The spring return actuators should be installed in the horizontal position on the fire damper. They can be rotated into a suspended and a vertical position on site!

**Release mechanism BAE 72B-S/9** for operation units M220-7 (D), M24-7 (D), M220-4, M24-4 and M24-8

- with release elements:
- ZBAE 72/9: 72°C (black) or
  - ZBAE 95/9: 95°C (green)



\* AMP connectors can be removed if they are not being used.

Use of  
**FR90 fire dampers in potentially explosive areas**  
 Directive 2014 / 34 / EU (EU declaration of conformity)



FR90 fire dampers with:

- thermal-mechanical release mechanism and with explosion-protected electrical limit switches
- explosion-protected electrical spring return actuators

may be used in accordance with the following table:

Building area where a dangerous, potentially explosive atmosphere may occur in normal operation...	... as a mixture of air and combustible gases, mists or vapours...		... in the form of a cloud of combustible dust contained in the air...	
	... can form occasionally.	... occurs temporarily or not at all.	... can form occasionally.	... occurs temporarily or not at all.
Zone	1	2	21	22
Identification of the fire damper	II 2 G c IIc T6/T5	II 3 G c IIc T6/T5	II -/2 D c T80°C/T95°C	II -/3 D c T80°C/T95°C
<b>Thermal-mechanical release mechanism</b> without limit switch (Fig. 2) or with <b>explosion-protected limit switches</b> (Fig. 4)	X	X *)	X	X *)
<b>Thermal-electrical release mechanism</b> and spring return actuator (Fig. 9)	<b>EM-1</b> or <b>EM-2</b>	X *)	X	X *)
	<b>RM-1</b>	-	-	X
Ambient temperatures: -20°C ... +40°C for T6 and T80°C / -20°C ... +50°C for T5 and T95°C				*) Can also be used in this zone!

**Important!**

In potentially explosive areas, fire dampers and terminal boxes EM-1, EM-2 and RM-1 spring return actuators must be earthed with at least 4 mm<sup>2</sup> Cu and integrated into the equipotential bonding.

**Technical documentation**

User manuals, operating instructions, price lists, certificates etc. are available to download online at [www.wildeboer.de](http://www.wildeboer.de).

**Spare parts**

Release mechanisms, remote releases, operation units, spring return actuators, limit switches and release elements can be replaced, provided that they are available. Order data and prices can be taken from the price list for components and spare parts.



## Hygiene instructions for disinfecting FR90 fire dampers!

### General information on carrying out disinfection measures

Appropriate occupational health and safety measures must be observed when carrying out disinfection and handling disinfectants. The personnel carrying out disinfection must be instructed on the work and trained accordingly.

Direct contact with disinfectant should be avoided during work. Personal protective clothing must be worn, which should at least comprise suitable protective gloves, protective clothing and safety goggles. In addition, the manufacturer's safety data sheets must be observed and general sanitary measures must be followed, such as not eating, drinking or smoking in the work area.

The disinfectants are normally used in the specified application concentration and exposed to a mechanical effect (scouring/wiping disinfection procedure), following thorough cleaning of the surface to be treated.

Materials that cannot have an absorbing effect on the disinfectants used should be used as wiping utensils. Only fresh wiping utensils may be used for the disinfection process. All utensils must be subjected to disinfection treatment and dried following use. If this is not possible, disposable wipes should be used.

If a scouring/wiping disinfection procedure is not possible, the surfaces can also be disinfected without using mechanical means, e.g. spray disinfection.

When using disinfectants containing alcohol, observe that a quantity of 50 ml working solution per m<sup>2</sup> of surface to be treated and max. area of 2 m<sup>2</sup> are not exceeded during large-area application due to the risk of fire and explosion.

Disinfectant is often in the form of concentrate. The relevant working solutions must always be freshly prepared (i.e. for the working day). When using the chosen disinfectant for disinfecting surfaces, the application concentration/time ratios must not fall below those specified in the list of disinfectants of the Disinfectants Commission in the Association for Applied Hygiene (VAH) in Germany or in the list of the Robert Koch Institute. Furthermore, the manufacturer's specifications for the relevant disinfectant must be observed.

The disinfectants must be dispensed via local type-tested disinfectant dosing devices, which must be regularly maintained and checked.

No soaps or washing active substances may be added to the disinfectant solutions or disinfectants.

Working solutions that are not used up must not be left open for an extended period or used (1 working day at the most).

Sufficient ventilation must be ensured in the areas concerned in the case of large-surface applications of disinfectants.

The surfaces of ventilation and air conditioning systems and devices should firstly be thoroughly mechanically cleaned and then disinfected. One should proceed as follows:

1. Wet cleaning with cleaning agents for removing dirt of, for example, greasy or lime-scale residues, or sucking up dry impurities;
2. With wet cleaning: flushing out the used cleaning agent and the dirty water, drying of the surfaces;
3. Disinfection (spray or scouring/wiping disinfection) of surfaces with a suitable disinfectant (refer to VAH list of disinfectants);
4. Flushing out disinfectant with clean water.

Disinfectants should be selected by considering the following criteria:

- ▶ disinfectant effect on microorganisms
- ▶ consideration of material properties
- ▶ health aspects should be noted
  - good skin, mucous membrane compatibility
  - no allergenic, mutagenic, carcinogenic effects
  - no odour
- ▶ environmental compatibility, as the case may be.

### Resistance to disinfectants

Components which are generally integrated in ventilation and air-conditioning systems and operated together must be included in sanitary and operational measures (cleaning and disinfection). The stability of materials of all air-conducting components has been verified for the substance groups quaternary compounds and alcohol.

- Quaternary compounds are characterised by a sufficient action spectrum and good compatibility with materials, health and the environment, and do not cause odour nuisance. They are also recommended in the healthcare sector for use in ventilation and air conditioning systems.
- A distinguishing feature of alcohol-based disinfectants is their rapid action, especially on small surfaces.
- The user must verify the suitability of other types of disinfectant! If this is not possible, they must not be used!

### Manufacturer of FR90 fire dampers:

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Tel.: +49 (0)4951 950 0 / Fax: +49 (0)4951 950 120 / [www.wildeboer.eu](http://www.wildeboer.eu)