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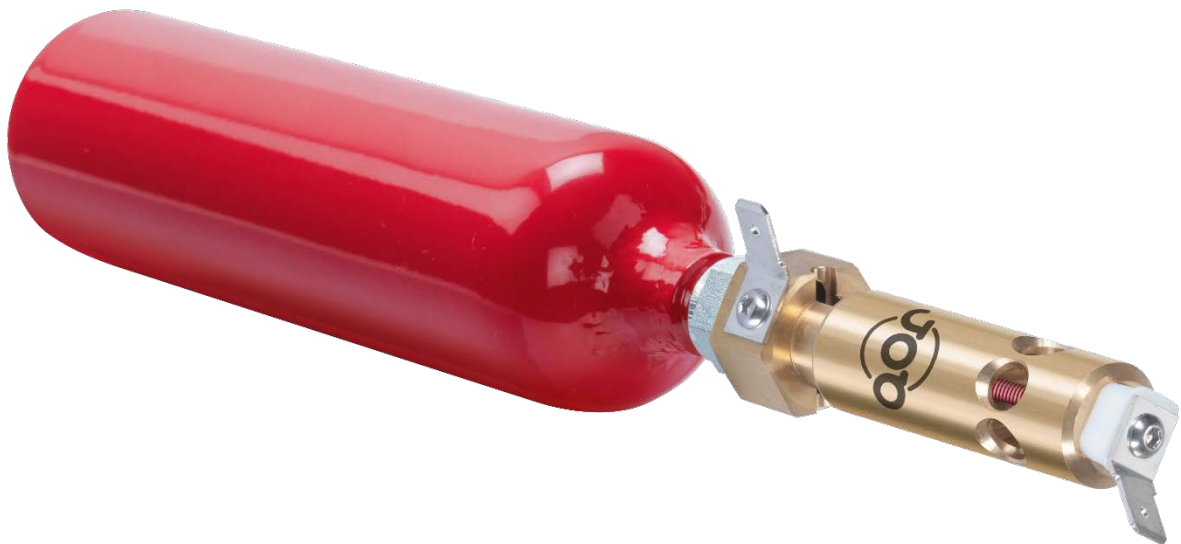
Inspection Guidelines

for

AMFE™ Product Line

v1.0_En

Automatic Miniature Fire Extinguisher - AMFE™ Series



These guidelines are an addendum to the information and requirements as per the most recent “Handling and Safety Instructions” for the AMFE.

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Appendix	Fehler! Textmarke nicht definiert.

Disclaimer

The AMFE™ product line is manufactured by

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The AMFE™ is “**MADE IN GERMANY**” and manufactured in accordance with all applicable standards and laws for the place of manufacturing.

NOVEC™ is a registered trademark owned by the 3M™ cooperation.

AMFE™ is a registered trademark owned by the JOB Group.

The AMFE™ is internationally patented. S-AMFE and R-AMFE are CE marked.

1 General remarks for use of AMFE™

The AMFE line is an automatic stand-alone fire extinguisher to be used in small enclosures or cabinets typically not fully accessible by humans (no rooms, walk-in machine cabinets or other open spaces).

AMFE (short for Automatic Miniature Fire Extinguisher) is an independent, thermally initiating, stand-alone fire extinguishing device.

The integrated certified and listed sprinkler bulb (made by JOB) bursts when a defined operating temperature is exceeded, thus activating a spring mechanism which opens the attached cylinder containing an extinguishing agent. The extinguishing agent is then released.




The connected cylinder with the extinguishing agent is permanently factory-sealed (even after assembly with the AMFE head) until the AMFE opens it, in case of an over-temperature situation.

Safety during maintenance work with the AMFE™

The AMFE series has been designed to detect, extinguish and (optionally) report an emerging fire directly inside an electric and electronic device (e.g. electric cabinet, machine or similar small confined volumes).

BEFORE handling products of the AMFE line, these instructions and safety guidelines have to be read and understood by all people handling and/or working with these products.

Assembly, installation, service and maintenance shall only be carried out by technically knowledgeable personnel.

	Always handle the AMFE and cylinders with care!
	Do not drop it!
	Wear safety glasses when handling and/or installing the AMFE!

Once the assembly of the system is finished, the AMFE is ready to be activated! Excessive temperatures must be avoided (to prevent accidental activation) and the unit must not be dropped. The AMFE™ unit **MUST NOT** be used if it has fallen to the ground as this might have caused micro-fractures in the detecting glass bulb preventing proper operation.

The S-AMFE and R-AMFE variant of the AMFE™ product line should be electrically disconnected before inspection to avoid unintended electric complications (e.g. short-circuit, electric activation).

After inspection and maintenance, the electric connections have to be re-applied to insure proper operation.

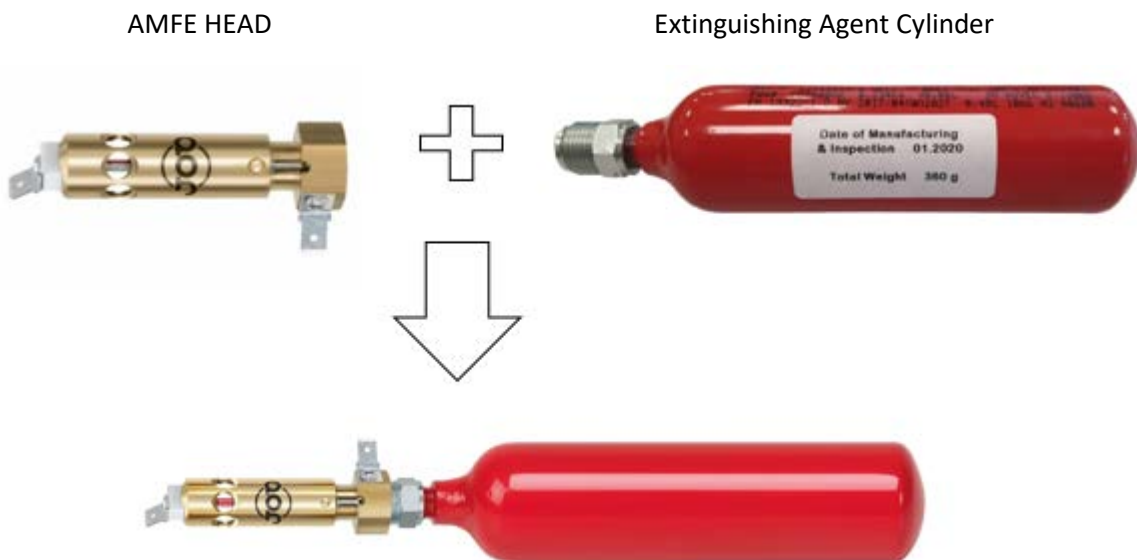


Information: The S-AMFE / R-AMFE are used in according to regulations with voltages lower than 60V DC ($U_{\text{signal_max}} = 24\text{V DC}$).

Therefore, in regard to product safety guideline 2001/95/EG a protection against human contact is not mandatory.

Correct handling during maintenance work

The AMFE system comprises of two major components.



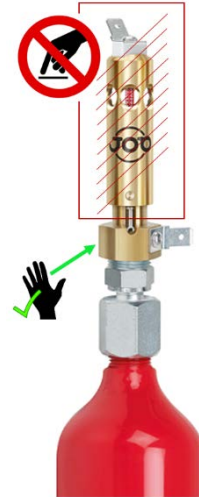
For normal operation, the two are attached to each other and Loctite is used to assure vibration resistant connection of the threading.



For maintenance work, the two parts do not need to be disassembled!



During maintenance work, the AMFE activation head must not be touched! Please do not hold the complete system at the head to avoid accidental damage to the activation mechanism.



Never try to unscrew the cylinder adapter with the rupture disc sealing from the pressurized red extinguishing agent cylinder!

2 Inspection Procedure

The JOB AMFE product is generally very low on maintenance if used as described in the “Handling and Safety Instructions” by the manufacturer.

The cylinders containing the extinguishing agent are factory sealed and remain closed (sealed) during normal operation. They are only opened in case of activation of the AMFE thermal element after which they discharge and must be replaced by a complete new system (head & cylinder combination).

It is good practice to regularly check and verify the content of the extinguishing agent cylinder.

The period between the inspections may vary from application to application and depends on the characteristics of the application (like vibrations, frequency and severity of temperature changes, dirt accumulation, etc.).

Maintenance cycle and time slot for maintenance work

It is recommended to check the AMFE head visually and to weight the AMFE and the attached extinguishing agent cylinder at least once per year and to replace the unit if necessary (e.g. if the content is insufficient to reach the design concentration required for the protected volume).

The maintenance work can be carried out with the next regularly timed maintenance cycle of the application/equipment where the AMFE™ is installed, but must be completed within 12 months after the due time.

The due time is defined by the original production date as indicated on the quality inspection sticker on the extinguishing agent cylinder:

Example:



Original date on the cylinder is “January 2020”. Maintenance should be carried out by January 2021, with a time slot of max 11 months after January 2021, meaning latest by December 2021. After this, the maintenance cycle repeats.

Inspection process

The cylinders are labeled with a total weight after filling, including the valve, adapter and sealing and a date of filling (similar to the picture above, changes are just of operational nature).

The weight on the label does not include the weight of an AMFE, S-AMFE or R-AMFE activation head.

Weight of AMFE/S-AMFE/R-AMFE initiation heads:

AMFE:	78g / 2.75 oz
S-AMFE and R-AMFE:	80g / 2.82 oz

It is not recommended or necessary to disassemble the activation head from the cylinder for the weight inspection (measuring), but the added weight (see above) of the head needs to be subtracted from the total weight when comparing it with what is printed on the label.



The weight of the unit is a relevant indicator, and the present and uncompromised thermos-bulb (colored liquid inside the glass bulb in the head).



An extinguishing agent cylinder shall be replaced after 10 years of operation or if the weight differs more than 5% from the originally labeled weight.

3 Weighting

The weights on the label represent the measurements at the manufacturer at the time of delivery. Upon arrival at the customer site there should be no significant deviation (small deviations are possible due to the nature of gravity, type of scale being used etc.). Such a deviation typically is below 1%.

The weight of the cylinder, together with the serial number of the cylinder shall be recorded, e.g. like this

Inspection Protocol

Date (dmy)	Serial number	Part number	Label Weight	Measured Weight
16.10.2020	L1234567	11101	360g	361g




Cylinders with a weight deviation of 5% or more MUST NOT be installed!

On the cylinder, the serial number and the part number can be found here:



Example of a simple measurement in the field:





The scale used has to have a resolution of 1g or better. The scale has to be controlled annually with a reference measurement.

The measured weight of the cylinder plus the weight of the attached head shall be stored for the records of the installed equipment. These numbers are the reference point for the maintenance, later in the field.

E.g.:

Inspection Protocol, Application XYZ

Date of installation	Serial number	Part number	Total weight (cylind. + head)
18.11.2020	L1234567	11101	440 g

Such record can later be used for maintenance purposes by comparing the measured vales

with the initially recorded values.



An extinguishing agent cylinder shall be replaced after 10 years of operation or if the weight differs more than 5% from the originally labeled weight.

4 Assembly of new cylinders (after replacing)

Assembly of AMFE and NOVEC™ cylinders

The AMFE head and the extinguishing agent cylinder are two separate parts which need to be assembled into one functional unit to be operational.

Required assembly tools:

- 1 x SW19 metric 19mm open-jaw torque wrench (5..10Nm)
- 1 x SW15 metric 15mm wrench
- medium strength thread-lock adhesive (e.g. Loctite 243)
- Cleaner (to be used before Loctite 243 is applied)

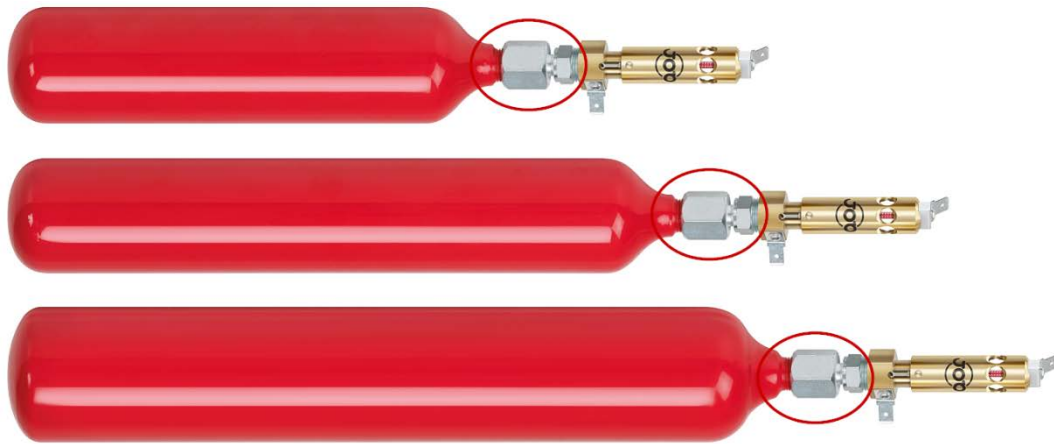
Assembly procedure

The AMFE line extinguishing agent cylinders come in various sizes.

- Smaller sizes (0, 1 and 2) have a single valve



- Larger sizes (3, 4 and 5) additionally have an adapter between the cylinder and the valve



Assembly is identical for both designs!

Assembly steps

1. Use cleaner to clean the threads of both, agent-cylinder and the AMFE (internally) as good as possible. Let the remains of the cleaning agent vaporize for a short time before continuing.

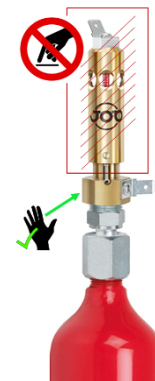
2. Apply Loctite™ 243, be careful to only add it onto the first two turns (see picture)



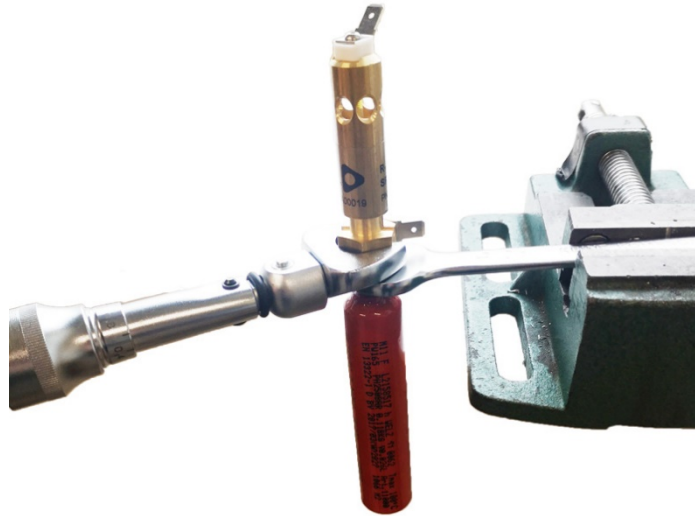
3. Put the cylinder with the extinguishing agent into the SW15 assembly aid or hold the cylinder in one hand and carefully screw the AMFE series product onto the cylinder valve, pre-tightened by hand.



Do not apply force while assembling the AMFE initiation head on body part! Only apply force via the 19mm lower part of the head!



4. Use the SW19 open-jaw torque wrench to tighten the AMFE series activation head onto the cylinder (see picture) while the cylinder is held with the SW15 wrench.



The torque applied has to be between 7 Nm and 10 Nm!

It is suggested to record the weights of the extinguishing agent cylinder upon assembly or installation at the intended place of use.

Please refer to the “Handling and Safety Instructions for the AMFE™ Line” documents for details, and observe the recommendations in the document “Initial Weigh Inspection Guideline for AMFE line”.

5 Refilling, recharging of cylinders and recycling

The cylinders containing the extinguishing agent NOVEC™ as provided by JOB are intended for a single, one-time use only. They are not to be refilled or recharged.

The AMFE initiation heads cannot be re-used and can be discarded after use.



The initiation heads as well as the cylinders are non-hazardous after activation, contain no pressure and no residues. They can be recycled as scrap metal in accordance with local regulations.

The material of the initiation heads is brass, the material of the cylinders is steel.

