Technical Description

Dry sprinkler EconAqua

Original document

IMPORTANT! Read this document before starting any work!

This document is a mandatory part of the product and should therefore always be stored freely accessible and for further usage.

1 General

This document refers to the following products:

Designation
Dry sprinkler EconAqua DSP-K13,5-68°Cx...-Cr-BSP
Subsequently referred to as “sprinkler”.

Applicable documents	Part no.
Product Sheet "Dry sprinkler EconAqua DSP"	M2-50-05 Part 2

1.1 About this document

This document enables the intended use of the product described. Observing all specified instructions and safety instructions is the prerequisite for safe work. Furthermore, the local accident prevention regulations and general safety conditions for the use of the product are also applicable.

If this document refers directly or indirectly to laws, regulations, or directives or quotes from them, the manufacturer cannot be held responsible for the correctness, completeness or up-to-date nature of the reference.

Observe the applicable guidelines, standards, and statutory legislation of the respective country of deployment.

INFORMATION

The manufacturer reserves the right to make modifications resulting from further developments while retaining the key features of the product described without making corrections to this document.

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Illustrations in this document are intended to facilitate basic understanding, and may differ from the actual design of the product.

2 Safety

2.1 Safety and warning notices

Safety and warning notices are marked with symbols in this document. The introductory signal words express the respective extent of the danger.

DANGER

The signal word describes a danger with a high risk level. If the danger is not avoided, it will result in death or serious injury.

WARNING

The signal word describes a danger with a medium risk level. If the danger is not avoided, it may result in death or serious injury.

CAUTION

The signal word describes a danger with a low risk level. If the danger is not avoided, it may result in minor or moderate injury.

NOTICE

The signal word describes a danger with a low risk level. If the danger is not avoided, it may result in property and environmental damage.

Further markings

INFORMATION

This marking emphasizes useful tips and recommendations as well as information for efficient and trouble-free operation.

In instructions, this marking starts with the symbol *i*.

2.2 Intended use

Only use this product in accordance with the operating and ambient conditions as well as the maintenance specifications as described in this document.

The intended use includes that all notices in this document are observed.
Dry pendent sprinklers are heat-sensitive screen sprinklers suitable for installation in areas threatened by frost. The sprinklers are intended for use in dry or pre-action systems in which water or condensation must be prevented from reaching the down pipe before actuation of the sprinkler. They can also be installed in areas threatened by frost which are fed from a wet system in a neighboring heated zone.

2.3 Safe operation

If products are used improperly or for other than their intended purpose, these products can pose hazards or impair the system or other property. Only use products in an undamaged and fully functional condition. If safe operation can no longer be assured (e. g. visible damage), decommission the product without delay and secure against accidental commissioning.

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Also observe the following:

- Use only original spare and wear parts.
- Replace components that are not in perfect order immediately.
- Do not carry out any changes, extensions or modifications without the express permission of the manufacturer or distributor.
  This also applies to welding work on load-bearing parts.

INFORMATION

Modifications, additions or alterations that are not approved by the manufacturer eliminate the manufacturer's liability.

Also observe the following basic details:

- National safety regulations
- National accident prevention regulations
- National assembly and installation regulations
- Generally accepted technical principles
- Safety and warning notices as described in this document
- Demands on personnel as described in this document
- Directives for operation in explosion hazard areas (ATEX directive)
- If applicable, directives for operation in explosion hazard areas (ATEX directive)

2.4 Qualification of personnel

⚠ WARNING

Inadequately qualified persons pose a hazard!
Inadequately qualified persons cannot assess the risks involved in handling the product. They expose themselves and others to the risk of severe or fatal injuries.

- All work should be carried out only by persons qualified to do so.

Before starting any work, the following persons must be designated who have the knowledge required to operate the product:

- A person to be responsible for the system
- An operator/person authorized by the operator

For all tasks, only persons from whom it can be expected that they will carry out their tasks reliably are authorized to perform such tasks. Persons whose reaction time is affected, for instance by drugs, alcohol or medication, are not authorized.

Furthermore, all work must only be carried out by persons who meet the following prerequisites:

- They have read and understood this document including the safety instructions and warning notices.
- They are familiar with basic regulations on occupational safety and accident prevention.
- They have been given instruction on handling the product and the entire system.

The various tasks described in this document require that the persons responsible for them have different qualifications. These qualifications are specified in the following section:

Qualified specialist personnel
Qualified specialist personnel are persons with the following qualifications and authorizations:

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- These persons are qualified for the respective activities as a result of their education, experience, and participation in a training course conducted by the manufacturer or distributor.
- These persons have the appropriate knowledge of standards, directives, accident prevention regulations, and operating conditions.
- These persons have been authorized by the person responsible for the safety of the system to carry out the necessary activities and are capable of recognizing and avoiding possible risks.

Unauthorized persons

⚠ WARNING

Risk of injury for unauthorized persons!
Unauthorized persons who do not meet the requirements described are not familiar with the risks connected with the function (e.g. triggering and/or isolating) of the system.
This poses risk of injury.

- Keep unauthorized persons away from control equipment.
- In the case of doubt, speak to persons and instruct them to move away from control equipment.

2.5 Personal protective equipment

Personal protective equipment is designed to protect people from risks to their safety and health at the workplace.

Personnel must wear personal protective equipment, which is specially indicated in the individual sections of this document, when carrying out the various tasks.

The personal protective equipment is described in the following section:

Protective goggles

Protective goggles cover the entire area of the eyes (including the sides) and are used to protect the eyes from the extinguishing agent and from particles that are whirled up by the extinguishing agent.

Safety footwear

Safety footwear protects the feet from crushing injuries, falling parts, and slipping on slippery substrates.

Safety gloves

Safety gloves are used to protect the hands from friction, abrasions, puncture wounds or deeper wounds as well as coming into contact with hot surfaces.

2.6 Obligations of the operator

Operator in the sense of this document is any natural person or legal entity using the product personally or on whose behalf it is used. In special cases (e.g. leasing, rental), the operator is the person responsible for ensuring that the operator obligations are observed in accordance with the contractual agreements between the owner and user of the product.

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During operation, the operator is responsible for the legal product stewardship for the protection of the user, personnel or third parties.

The area of responsibility, the competence, and the monitoring of personnel must be precisely defined by the operator.

The operator is obliged to undertake the following:

- Avoid any risks to life and health of the user or third parties.
- Ensure protection against unauthorized access.
- Operate the installation or system taking into consideration the applicable standards, guidelines and this document.
- Prevent use for other than the intended purpose.
- Check the permanent functional readiness of the installation or system at regular intervals.
- Have only persons carry out work who are appropriately qualified, trained, and authorized.
- Ensure the use of suitable personal protective equipment.

3 Transport, packaging and storage

Observe the following for transport, packaging, and storage:

- Packaged items must be transported in such a way that they do not create a source of danger by slipping or falling.
- Protect packaged items against external force such as impact, shock and vibrations.
- Inspect the packaged items for completeness and visible signs of damage immediately on receipt.
- Store the packaged items in their original packaging dry, dirt-free, dust-free, and within the specifications defined in this document.
- Dispose of the packaging material in accordance with the prevailing legal provisions and local regulations.

INFORMATION

The packing pieces may contain instructions that exceed the requirements specified herein. Follow these additional instructions accordingly.

The storage temperatures for the sprinklers must not exceed the values in *“Storage temperatures for sprinklers” on page 5*.

Sprinkler nominal response temperature	Maximum storage temperature
57 °C (135 °F)	35 °C (95 °F)
68 °C (155 °F)	45 °C (113 °F)
79 °C (175 °F)	55 °C (131 °F)
93 °C (200 °F)	65 °C (149 °F)
141 °C (286 °F)	105 °C (221 °F)

Tab. 1: Storage temperatures for sprinklers

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4 Design and function

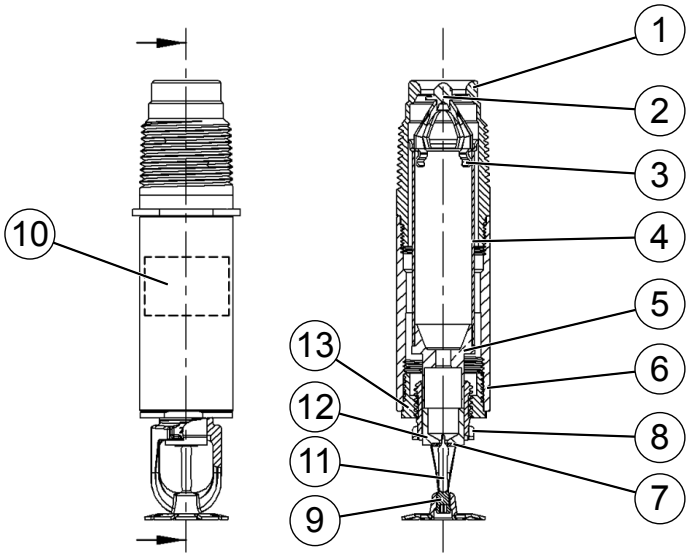

Fig. 1: Dry sprinkler design

1 Threaded stubs
2 Sealing element
3 Pipe adapter
4 Support tube
5 Orifice plate
6 Down pipe
7 Washer F3
8 Nozzle
9 Threaded pin
10 Sign
11 Glass bulb
12 Use
13 Reducer

The dry sprinkler is a mechanical construction and creates a seal via a sealing element in the threaded stub. The sealing element is held in place above a support tube by means of a glass bulb filled with a liquid. The glass bulb liquid expands when heated. If the fire heat warms the glass bulb to the nominal release temperature, it shatters so that the supporting effect of the glass bulb above the support tube to the sealing element is canceled and the path for the extinguishing water is released and distributed across the fire.

5 Assembly and installation

Personnel:
- Qualified specialist personnel

Protective equipment:
- Protective goggles
- Safety gloves
- Safety footwear

⚠ WARNING

Danger due to defective components!
If installed incorrectly, the glass bulb, which is responsible for activation of the sprinkler, may be damaged so that the sprinkler can no longer be activated. If components are defective, there is a risk of serious injury and even death, as well as serious damage to property.
- Check the sprinkler for damage after installation.
- Only operate product in an undamaged state.

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⚠ WARNING

Risk of injury due to crushing!
There is a risk of injury with bruising and crushing due to heavy weights when carrying out work.

- Ensure protection against unauthorized access.
- Never reach into the dangerous crushing zone, as long as parts can move or move there.
- Make sure this work is only carried out by qualified and fully trained personnel.
- Ensure the use of personal protective equipment.

⚠ WARNING

Risk of injury due to falling objects!
Falling objects can cause serious injuries due to their heavy weight or sharp edges.

- Wear suitable personal protective equipment.
- Keep the assembly area below the assembly location clear.
- Always handle components in such a way that they do not fall down.

NOTICE

Damage due to improperly executed work!
Improperly executed work can result in consequential damage and damage to property.

- Make sure that appropriately qualified personnel only carry out all work.
- Observe the instructions and safety instructions in this document.

NOTICE

Loss of approval and warranty claims!
Each modification to the sprinkler, the sleeve or the escutcheon, e.g. by painting, twisting or bending the components, changes the effectiveness of the sprinkler and results in the loss of approvals and possible warranty claims.

- Instruct persons working with or at the product accordingly.

5.1 Assembly of the sprinkler in dry systems

⚠ DANGER

Suffocation hazard due to oxygen reduction!
If the sprinklers are used in drying pipelines filled with nitrogen and nitrogen escapes unintentionally at the sprinkler thread it can reduce the oxygen concentration in the room. This leads to a risk of suffocation.

- Seal the sprinkler at the thread during assembly in dry systems.
- Perform a leak test of the pipe network and check the seal at the thread.
- Ventilate the room well.
- Work must only be carried out by at least two persons instructed about this danger.

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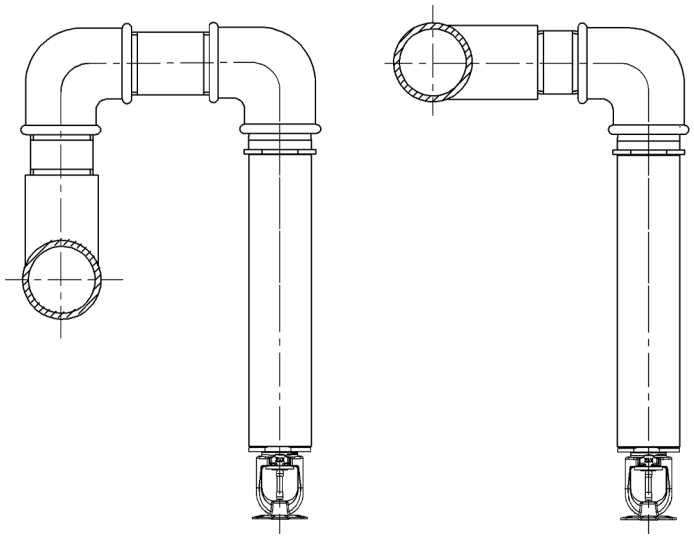

Fig. 2: Examples of installation

Dry sprinklers can be installed in arm pipes pointing upwards or arm pipes to the side.

5.2 Determination of order size "L"

The dry sprinklers are offered in the standard lengths (purchased using part no.) as a complete unit. It is also possible to manufacture special sizes. The order size is equal to the installation size "L". With EconAqua DSP, the order size "L" is measured from the lower edge of the fitting to the end of the down pipe. In the Configurator, the order sizes must be rounded to increments of 5 mm (0.2 in).

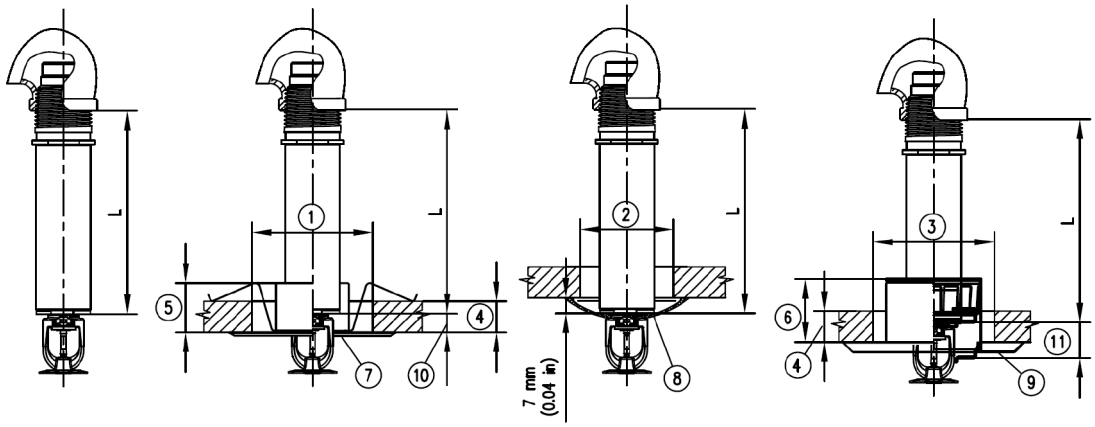

Fig. 3: Determination of installation size "L"

1 Ceiling hole diameter: 60 ... 70 mm (2.36 ... 2.76 in)
2 Ceiling hole diameter: 30 ... 48 mm (1.18 ... 1.89 in)
3 Ceiling hole diameter: 50 ... 65 mm (1.97 ... 2.56 in)
4 Thickness false ceiling: Maximal 22 mm (0.87 in)
5 Depth escutcheon F: 23 mm (0.91 in)
6 Depth escutcheon E: 31 mm (1.22 in)
7 Escutcheon F
8 Escutcheon G
9 Escutcheon E
L Order size
* Minimum hole diameter for the Dry sprinkler EconAqua DSP is 46 mm (1.81 in)

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5.3 Installation of dry sprinkler EconAqua

Tool: ■ Open-end wrench, key-width 34

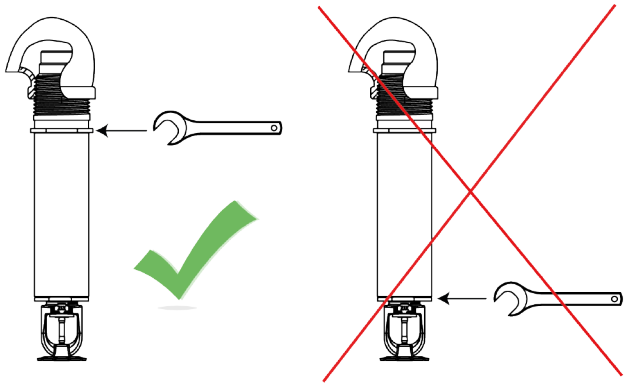

Fig. 4: Positioning open-end wrench

1. ⚠ **WARNING! Danger due to defective components!**
   Observe correct assembly with the open-end wrench (Fig. 4).
2. Only install the dry sprinkler with the open-end wrench over the hexagon of the threaded connector (Fig. 4/left).

5.4 Assembly with sprinkler socket EconAqua DSP

Tool: ■ Sprinkler socket EconAqua DSP, ↬ *Chapter 7 “Accessories and spare parts” on page 13*

1. ⚠ **WARNING! Danger due to defective components!**
   For the assembly only use the sprinkler socket EconAqua DSP.
2. The sprinkler socket can be used to mount sprinklers that are difficult to access, e .g. in false ceilings.

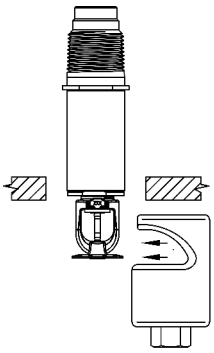

Fig. 5: Applying the sprinkler socket

3. Slide the socket carefully sideways over the sprinkler (Fig. 5).

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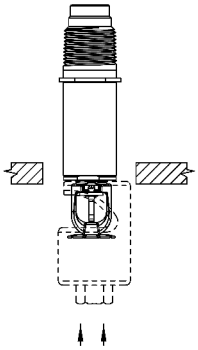

Fig. 6: Positioning the sprinkler socket

4. Push the socket carefully upward and turn it slightly until it is in contact with the socket flat.

5.5 Protecting cold storage cells with dry sprinklers (wet systems)

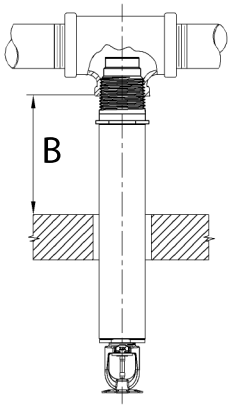

Fig. 7: Required exposed minimum length "B"

B Exposed down pipe

If the dry sprinkler is used to protect cold storage cells, a minimum down pipe length "B" (*“Required minimum down pipe length based on environmental temperature in the protected zone” on page 11*) must be maintained in the frost-free zone.

INFORMATION

The required exposed minimum length is not the order size "L". For the order size "L", see Chapter 5.2 “Determination of order size "L"” on page 8.

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Ambient temperature of the protected zone	Minimum temperature at exposed down pipe		
	4 °C (40 °F)	10 °C (50 °F)	16 °C (60 °F)
	Required exposed minimum down pipe length from the lower edge of the fittings to the outer side of the insulation (Fig. 7)		
	mm (in)	mm (in)	mm (in)
4 °C (40 °F)	0	0	0
-1 °C (30 °F)	0	0	0
-7 °C (20 °F)	100 (4)	0	0
-12 °C (10 °F)	203 (8)	25.4 (1)	0
-18 °C (0 °F)	305 (12)	76 (3)	0
-23 °C (-10 °F)	356 (14)	102 (4)	25.4 (1)
-29 °C (-20 °F)	356 (14)	152 (6)	76 (3)
-34 °C (-30 °F)	406 (16)	203 (8)	102 (4)
-40 °C (-40 °F)	457 (18)	203 (8)	102 (4)
-46 °C (-50 °F)	508 (20)	254 (10)	152 (6)
-51 °C (-60 °F)	508 (20)	254 (10)	152 (6)

Tab. 2: Required minimum down pipe length based on environmental temperature in the protected zone

INFORMATION

If the ambient temperatures are between the listed values, use the next coolest temperature to determine the minimum down pipe length. Interpolating is not permitted!

5.6 Dry sprinkler seal

To prevent the formation of condensation and ice around the sprinkler body, which can hinder activation or cause a premature, unintentional activation, the space around the down pipe (Fig. 8/1) must be closed or isolated (Fig. 8/3).

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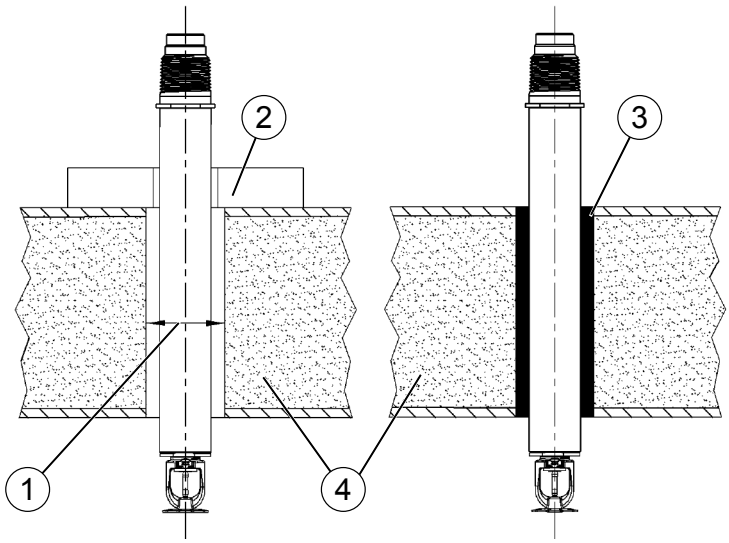

Fig. 8: Seal on the outside (left), seal in the ceiling (right)

1 Opening
2 Insulation seal
3 Seal
4 Insulated ceiling

INFORMATION

The sprinkler is either sealed with the insulation seal or a seal on the ceiling.

Insulation seal

→ Seal the opening (Fig. 8/1) with the insulation seal (Fig. 8/2) above the insulated ceiling (Fig. 8/4).

Seal

→ Seal the opening (Fig. 8/1) within the insulated ceiling (Fig. 8/4) with a suitable sealant.

INFORMATION

If moisture and temperature differences cause the formation of condensation on the exposed dry sprinkler, wrap the exposed part of the down pipe (Fig. 7/B) with insulation, foam insulation tape, or similar.

6 Maintenance

Personnel:
- Qualified specialist personnel

Protective equipment:
- Protective goggles
- Safety gloves
- Safety footwear

NOTICE

Damage to the system due to aggressive cleaning agents!
Acidic or alkaline cleaning agents may cause substantial damage to the system and its components.

- Only clean the component surfaces with water.
- Do not use acidic or alkaline cleaning agents.

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NOTICE

Damage to the system due to incorrect cleaning devices!
Incorrect cleaning devices may cause substantial damage to the product.

- Only clean the component surfaces with a clean and moist cloth.
- Never remove residue and/or corrosion residue on the component surfaces with files, grinders or similar material-removing cleaning devices.

Carry out the tasks listed below.
If deviating locally applicable laws, regulations or directives require shorter maintenance intervals, these must be observed. If there are special ambient conditions, e.g. corrosive atmosphere, increased dirt accumulation or extreme temperature fluctuations, shorter maintenance intervals may be required.
Annually:

- Check sprinkler arrangement (e. g. new room arrangement, partition walls).
- Check sprinkler for obstructions to water distribution (e. g. space under and next to the sprinkler, advertising signs).
- Visual check for damage, contamination, and coatings.
  If damaged, the product must be replaced immediately. A repair or overhaul is not permitted. The complete sprinkler must always be replaced.

Every 12½ years:

- The sprinklers must be replaced with new ones.

INFORMATION

To restore system stand-by, the opened sprinklers must be completely replaced.

7 Accessories and spare parts

Designation	Part no.
Sprinkler socket type EconAqua DSP [1)]	4000097
Water shield 2-piece sprinkler 21	846713
Sprinkler guard sprinkler 21	929513
Sleeve escutcheon E - RAL9016 - white[2)]	813905
Sleeve escutcheon E - special color[2)]	849658
Sleeve escutcheon E - chrome-plated[2)]	817054
Escutcheon F - RAL9016 - white[3)]	879189
Escutcheon F - special color[3)]	849657
Escutcheon f - chrome-plated[3)]	879190
Escutcheon G-½[4)]	845151

Tab. 3: Accessory list

[1)] A ½" ratchet is required (not available from manufacturer)

[2)] With the escutcheon "E", the spring element on the dry sprinkler must be preassembled by the manufacturer as subsequent assembly is not possible. Screwing in the dry sprinkler with preassembled spring element is not possible in suspended ceilings with the sprinkler socket (part no.: 4000097).

[3)] The escutcheon "F" cannot be retrofitted. Assembly including centering sleeve is **not** possible.

[4)] The escutcheon "G" can be retrofitted.

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8 Disposal

At the end of the product's service life, dispose of it in accordance with legal regulations or through the national recycling system.

9 Technical data

Designation	Definition
Minimum operating pressure	5 bar (72.5 psi)
Maximum operating pressure	16 bar (232 psi)
Thread size	R1"-ISO7/1
Nominal k factor for all permitted lengths	13.5 metric (0.94 imperial)
Sprinkler nominal response temperature	68 °C (155 °F)
Maximum ambient ceiling temperature	38 °C (100 °F)
Lowest ambient temperature	-54 °C (-65 °F)

Tab. 4: Technical specifications

Designation	Definition
Nozzle body	Brass
Deflector	Stainless steel
Glass bulb	Glass, nominal diameter 3 mm
Sealing element	Nickel alloy, coated on both sides with Polytetrafluoroethylene (PTFE)
Threaded pin	Brass
Sealing valve	Brass
Sealing valve adapter	Brass
Orifice plate	Brass
Support tube	Steel, electrolytically applied epoxy coating
Threaded stubs	QM brass
Sealing valve carrier (internal)	Stainless steel
Down pipe	Steel, electrolytically applied epoxy coating
Washer F3	Stainless steel
Reducer	Brass

Tab. 5: Table of materials

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