Instructions for use
Sprinkler 21

Original document

Part no.: 922713 | DOC ID: 100183122 | Document no.: 100066303 | Approval / modification no.: EW24-092 | Rev./Vers.: 01/03 | Language: en_US | Edition: 08-2025

Target group of the document

This document is intended exclusively for the qualified installer.
Take further personnel requirements into account!

1 Legal note

Deutsch:
Produkt nur einbauen, inbetriebnehmen und warten, wenn diese Anleitung klar verstanden wird.

Français:
N'installer, ne mettre en service et n'entretenir le produit que si les présentes instructions ont été clairement comprises.

Български:
Инсталирайте, пуснете в експлоатация и поддържайте продукта само ако тази инструкция е ясно разбрана.

Eesti keel:
Paigaldage toode, võtke see kasutusele ja hooldage seda ainult siis, kui saate sellest juhendist selgelt aru.

Ελληνικά:
Η εγκατάσταση, θέση σε λειτουργία και συντήρηση του προϊόντος επιτρέπονται μόνο εάν οι παρούσες οδηγίες έχουν γίνει κατανοητές.

Italiano:
Montare il prodotto, metterlo in funzione ed eseguirne la manutenzione solo se si sono comprese appieno le seguenti istruzioni.

Latviešu:
Produkta iemontēšanu, ekspluatācijas sākšanu un tehnisko apkopi veikt tikai tad, ja dotā instrukcija ir pilnībā saprasta.

Malti:
Installa, ikkummissjona u wettaq manutenzjoni fuq il-prodott biss jekk dawn l-istruzzjonijiet jinftiehmu b'mod ċar.

Polski:
Produkt należy instalować, uruchamiać lub konserwować tylko wtedy, gdy poniższe instrukcje są w pełni zrozumiałe.

Română:
Montați produsul, puneți-l în funcțiune și întrețineți-l numai dacă instrucțiunea următoare este înțeleasă clar.

Slovenčina:
Namontujte, spustite do prevádzky a udržiavajte výrobok iba vtedy, pokiaľ ste jasne pochopili tento návod.

Čeština:
Namontujte, spusťte do provozu a udržujte produkt pouze tehdy, když jste jasně pochopili tento návod.

English:
Do not install, start up and maintain the product unless you have clearly understood these instructions.

Español:
Montar el producto, ponerlo en funcionamiento y realizar el mantenimiento solo cuando se hayan comprendido claramente estas instrucciones.

Dansk:
Du må kun installere, idriftsætte og vedligeholde produktet, hvis du har forstået denne vejledning til fulde.

Suomi:
Tuotteen asennus, käyttöönotto ja huolto ovat sallittuja vain, jos tämä ohje ymmärretään selvästi.

Gaeilge:
Ná déan an táirge a shuiteáil, a thosú agus a chothabháil mura dtuigeann tú na treoracha seo go soiléir.

Hrvatski:
Ugradite, puštajte u pogon i održavajte proizvod samo ako su ove upute jasno razumljive.

Lietuvių k.:
Produktą montuokite, pradėkite jo eksploataciją ir techninės priežiūros darbus vykdykite tik tuomet, jei aiškiai suprantate šią instrukciją.

Nederlands:
Product alleen installeren, in gebruik nemen en onderhouden, als de volgende instructies goed zijn begrepen.

Português:
Instalar, colocar o produto em funcionamento e fazer a manutenção somente se as instruções a seguir forem claramente compreendidas.

Svenska:
Montera produkten, ta den i drift och underhåll den endast om du förstår denna instruktion.

Slovenščina:
Izdelek vgradite, zaženite in vzdržujte samo, če ste dobro razumeli navodila v nadaljevanju.

Magyar:
Csak akkor építse be a terméket és végezzen karbantartást, ha a következő útmutatót egyértelműen megértette.

2 General

This document refers to the following products:

Series
Sprinkler 21 MX3 - FP
Sprinkler 21 MX3 - FU
Sprinkler 21 MX3 - SP - 24
Sprinkler 21 MX3 - SP
Sprinkler 21 MX3 - SU
Sprinkler 21 MX3 - WWH
Sprinkler 21 MX3 - P
Sprinkler 21 MX3 - U
Sprinkler 21 MX5 - FP
Sprinkler 21 MX5 - FU
Sprinkler 21 MX5 - SP - 24
Sprinkler 21 MX5 - SU
Subsequently referred to as "sprinkler".

The following series are available:

- Spray sprinkler, upright (SU)
- Spray sprinkler, pendent (SP)
- Flat spray sprinkler, upright (FU)
- Flat spray sprinkler, pendent (FP)
- Extended coverage sprinkler, horizontal (WWH)

INFORMATION

Current approvals can be found in the data sheets.

Sprinkler 21	SIN number
MX5-SU½"-K80_..°C	MX1001
MX5-SP½"-K80_..°C	MX1021
MX3-SU½"-K80_..°C	MX3001
MX3-SP½"-K80_..°C	MX3021
MX5-SU½"-K115_..°C	MX2002 *
MX5-SP½"-K115_..°C	MX2022 *
MX3-SU½"-K115_..°C	MX3502 *
MX3-SP½"-K115_..°C	MX3522 *
MX5-SU¾"-K115_..°C	MX2001
MX5-SP¾"-K115_..°C	MX2021
MX3-SU¾"-K115_..°C	MX3501

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Sprinkler 21	SIN number
MX3-SP¾"-K115_..°C	MX3521
* not UL listed	

Tab. 1: Sprinkler 21/SIN number

Applicable documents

Other auxiliary materials - auxiliary and operating materials	M1-01-04 Part 1

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

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.

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

Observe the applicable guidelines, standards, and statutory legislation for this product.

3 Safety

3.1 Safety and warning notices

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

⚠ WARNING

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

NOTICE

This 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*.

3.2 Warnings in instructions

Warnings can refer to specific, individual instructions. Such warnings are embedded in the instructions so that they do not interrupt the reading flow when executing the action. The signal words described above are used.
Example:

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1. Unscrew screw.
2. ⚠ **CAUTION! Clamping danger on the cover.**

   Carefully close the cover.
3. Tighten screw.

3.3 Intended use

This product is designed exclusively for use in industrial production or operational plants.

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.

The sprinklers are components for automatic sprinkler systems and are intended solely for installation in the pipelines of fire suppression systems. The sprinklers are used in both wet and dry systems. Unless otherwise specified, they have tapered external threads in accordance with DIN EN 10226 with a shortened measuring plane and must be paired only with appropriately matching internal threads. Sprinklers are not approved for recessed and concealed installation according to UL Listing.

Improper use

Use for any other or additional purpose is considered as not intended.

3.4 Safe operation

If products are used improperly or for purposes other than their intended use, these products can pose hazards or impair systems or other property. Only use products in an undamaged and fully functional condition.

Furthermore, always adhere to the following points:

- Use only original spare and wear parts.
- Replace parts that are not in perfect condition immediately.
- Do not carry out any changes, extensions, or modifications.

Also observe the following fundamental information:

- National and locally applicable guidelines, standards, and regulations
- National and locally applicable safety regulations
- National and locally applicable accident prevention regulations
- National and locally applicable assembly and installation regulations
- Generally accepted technical principles

3.5 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.

Tasks may only be performed by persons who can be reasonably expected to perform the tasks reliably. Persons whose reaction time is impaired (e.g. by drugs, alcohol, or medication) are not authorized.

All work must be carried out only by persons who meet the following prerequisites:

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

The various tasks described in this document require that the persons responsible for them have different qualifications. These qualifications, which are referred to again at the beginning of the respective section of this document, are specified below:

Qualified specialist personnel

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

- These persons are qualified for the respective activities as a result of their education, experience, or 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.

3.6 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.

Additional personal protective equipment may also be required due to local conditions, directives, company specifications, etc.

The following describes the required personal protective equipment, which is referred to again at the beginning of the respective sections of this document:

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.

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4 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.

NOTICE

Damage due to improper storage!
The sprinkler bulbs may be damaged if stored incorrectly. This can cause subsequent damage and malfunctions.

- The storage temperatures for the sprinklers must not exceed the values in the following table.

Nominal response temperature	Minimum and maximum storage temperature
57 °C (135 °F)	-20 ... 35 °C (-4 ... 95 °F)
68 °C (155 °F)	-20 ... 45 °C (-4 ... 113 °F)
79 °C (175 °F)	-20 ... 55 °C (-4 ... 131 °F)
93 °C (200 °F)	-20 ... 65 °C (-4 ... 149 °F)
141 °C (286 °F)	-20 ... 105 °C (-4 ... 221 °F)

Tab. 2: Permitted storage temperatures

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5 Design and function

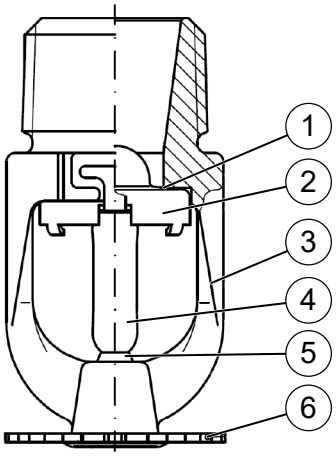

Fig. 1: Design of sprinkler 21 (example)

1	Seal ring	4	Glass bulb
2	Sealing valve	5	Threaded pin
3	Nozzle body	6	Deflector

During normal operation, the sprinkler is only exposed to external environmental impacts. The constant pressure in the pipe network acts on the sealing element of the sprinkler.

The sprinkler is a mechanical construction and creates a seal via a sealing element in the nozzle body. The sealing element is held in position through a glass bulb filled with a liquid. The liquid in the glass bulb expands when heated. If the heat of the fire reaches the nominal trigger temperature, it breaks. This removes the supportive effect of the glass bulb on the sealing element, which releases the path for the extinguishing water, and the extinguishing water is distributed over the area of the fire.

1. Check sprinkler marking (Fig. 2).
2. Ensure that the sprinkler thread and the thread on the socket or fittings into which the sprinklers are to be screwed are clean, dry and free from oil, grease and burrs.

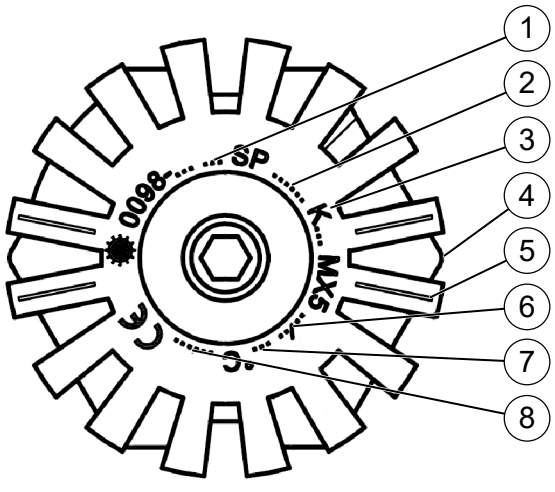

Fig. 2: Sprinkler 21 marking (example)

1	Approval	5	Orientation mark
2	Production number	6	Month/year (e.g. 09/20)
3	K value	7	Release temperature
4	Arm	8	SIN

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6 Assembly and installation

Personnel: ■ Qualified specialist personnel

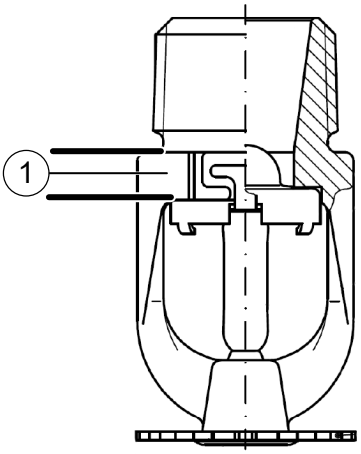

Fig. 3: Sprinkler 21 socket flat

1 Flat

INFORMATION

Observe national and locally applicable guidelines, standards and regulations for example NFPA 13 or EN 12845.The applicable standard for UL Listing is NFPA 13.

6.1 Sealing the sprinkler

INFORMATION

To seal the sprinklers, you must use only thixotropic sealants (e.g. Permabond A1044). These sealants are viscous and usually do not run or drip. Alternatively they can also be sealed using PTFE sealing tape or Loctite 55.

INFORMATION

When using the sealant, you must observe its corresponding documentation.

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1. Remove any remaining packaging from the sprinkler prior to sealing.

Fig. 4: Sprinkler with sealant (circumferential bead)

2. Apply a circumferential bead of sealant on the second and third pitches of the sprinkler thread at minimum.

   Only apply as much sealant as is absolutely necessary. Avoid using excess sealant.

3. **WARNING! Damage due to non-functional sprinklers!**
   Ensure that the sealant only comes into contact with the sprinkler thread and not the functional parts of the sprinkler.

4. Install the sprinkler immediately after applying the sealant *Chapter 6.2 “Installing the sprinklers” on page 9*.

   Subsequent realignment may lead to leaks, particularly at high ambient temperatures.

6.2 Installing the sprinklers

Note the following before screwing in the sprinklers:

- When using the mounting tools (sprinkler wrench or sprinkler socket), they must not touch the functional parts of the sprinkler (e.g. the glass bulb).
  The mounting tool must be positioned carefully and correctly. Positioning the mounting tool incorrectly or inappropriately causes damage to the sprinkler and/or an unapproved force on the sealing valve or glass bulb! Sprinklers damaged in this way may not actuate properly or may begin to leak under some circumstances, possibly even only after longer periods of time.
- If the sprinkler is supplied with a protective cap, only use the sprinkler wrench for installation. Do not remove the protective cap until the installation is complete and no damage is to be expected from further installation work in the room.
- It should be possible to screw in the sprinklers by at least four to five turns. Otherwise, you must check whether the external and internal threads are correctly aligned with each other.
- Aligning the sprinklers counter-clockwise may lead to leaks.

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1. Provide the sprinklers with sealant *Chapter 6.1 “Sealing the sprinkler” on page 8*.
2. Place the sprinkler onto the internal thread of the socket, down pipe or fitting and tighten it by hand with 1 to 2 turns clockwise.

   In some circumstances, you must turn the sprinkler slightly counter-clockwise first to find the run of the thread.

   NOTICE!
   Do not tilt the sprinkler while screwing it in.

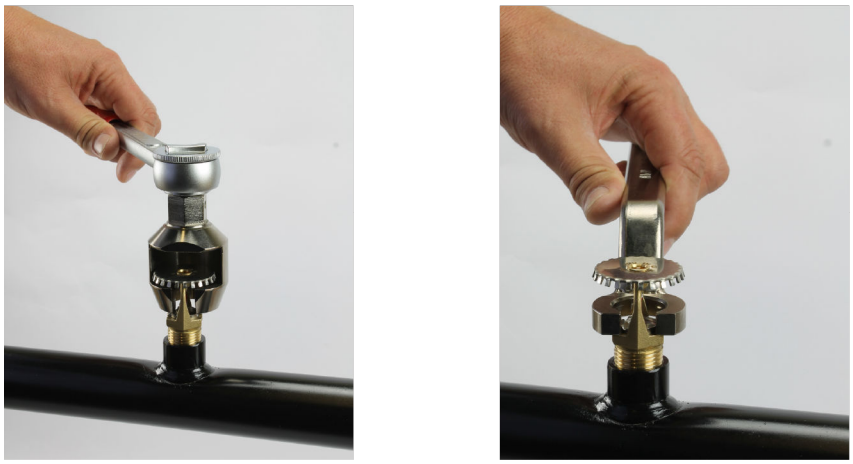

Fig. 5: Position the sprinkler socket (left) or sprinkler wrench (right)

3. Once the thread is positioned correctly, remove the protective cap from the side if necessary, carefully slide the sprinkler socket or sprinkler wrench sideways over the sprinkler (Fig. 5).

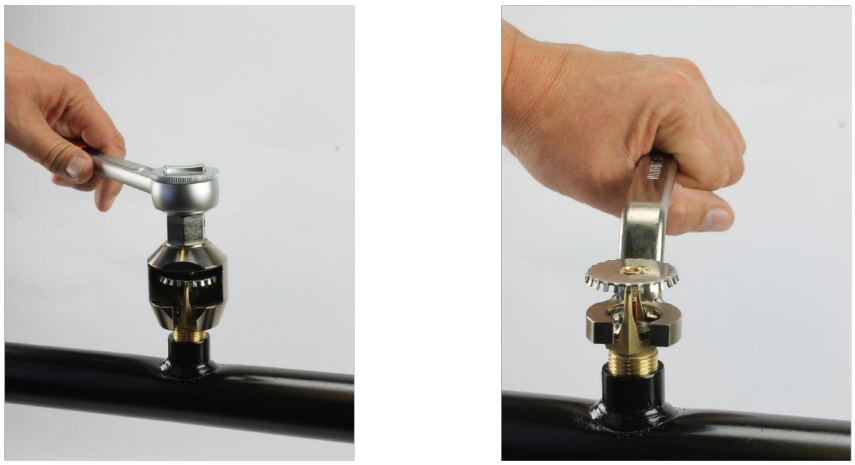

Fig. 6: Set the sprinkler socket (left) or sprinkler wrench (right) on the hexagonal bolt

4. Set the sprinkler socket or sprinkler wrench on the hexagonal bolt on the sprinkler (Fig. 6).
5. Screw in the sprinkler by four to five thread turns with a tightening torque of 20 Nm (14.8 lbf-ft).

   When aligning, a maximum tightening torque of 35 Nm (25.8 lbf-ft) must be observed.

6. Lift the sprinkler socket or sprinkler wrench off of the hexagonal bolt on the sprinkler and remove it from the sprinkler sideways without touching the glass bulb or other functional parts.
7. Allow the sealant on the sprinkler to cure sufficiently before checking the pressure/subjecting it to pressure.

   To the greatest extent possible, avoid moving the pipes during the curing time to avoid leaks at a later stage.

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⚠ WARNING

Danger due to improperly functioning sprinklers!
If the sprinklers are not functioning properly, system function is not ensured. This can lead to severe injuries or even death, as well as significant property damage.
- Before commissioning the system remove the protective cap, if present, from the sprinkler

7 Maintenance

Maintenance work must be carried out in accordance with national guidelines and standards and at regular intervals, taking account of operating conditions and environmental factors.

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.

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.

NOTICE

Damage caused by icing up!
When using the sprinkler in cold zones, condensate water may form and ice up the sprinkler head.
- Check the sprinkler for icing on a regular basis in cold zones.

INFORMATION

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

8 Accessories and spare parts

INFORMATION

Further details as well as recognitions, listings and more precise use of the accessories can be found in the documentation for the corresponding accessories.

Designation	Part no.
Omega shielding cap, ½" with O-ring cmpl. pendent (FP, SP)	847633
Omega shielding cap, ½" with O-ring cmpl. XCrNi pendent (FP, SP)	930980
Shielding cap ⅜" upright with sprinkler guard (FU, SU)	912247
Shielding cap ½", ¾" upright with screw (FU, SU)	843970
Deflector plate, Sprinkler 21 (FP, SP)	846388

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Designation	Part no.
Two-piece water shield, Sprinkler 21 (FP, SP)	846713
Sprinkler guard, Sprinkler 21, ⅜" (FP, FU, SP, SU)	912248
Sprinkler guard, Sprinkler 21, ⅜" XCrNi (FP, FU, SP, SU)	930469
Sprinkler guard, Sprinkler 21, ½", ¾" (FP, FU, SP, SU)	843480
Sprinkler guard, Sprinkler 21 ½", ¾" XCrNi (FP, FU, SP, SU)	929513
Sprinkler cage, Sprinkler 21 (FP, FU, SP, SU)	845794
Sprinkler socket, type 21 (FP, FU, SP, SU, WWH)	843755
Sprinkler wrench, type 21 (FP, FU, SP, SU, WWH)	843538
Sprinkler wrench, type 21 and Undercover (CCP, FP, FU, RP, SP, SU, WWH)	845905

Tab. 3: Accessory list

9 Disposal

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

10 Technical data

Designation	Definition
Minimum operating pressure	0.35 bar (5 psi) / UL 0.48 bar (7 psi)
Maximum operating pressure	12.5 bar (181 psi) / UL 12.1 bar (175 psi)
Nominal trigger temperature	*"Nominal trigger temperatures" on page 13*
Lowest ambient temperature	-54 °C (-65 °F)
K-factor	57*, 80, 115
Operating medium	Water / compressed air
* not UL listed	

Tab. 4: General data

Responsiveness	Sprinkler type	Response time index (RTI)	Glass bulb diameter
Standard	MX5	>80 to 200	5 mm (0.2 in)
Fast	MX3	<50	3 mm (0.12 in)

Tab. 5: Responsiveness summary

Release temperature	Color glass bulb liquid	Marking (deflector)
57 °C (135 °F)	Orange	57 °C
68 °C (155 °F)	Red	68 °C
79 °C (175 °F)	Yellow	79 °C

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Release temperature	Color glass bulb liquid	Marking (deflector)
93 °C (200 °F)	Green	93 °C
141 °C (286 °F)	Blue	141 °C

Tab. 6: Nominal trigger temperatures

Designation	Definition
Sprinkler body	Brass (Ms), chrome-plated (Cr) brass, stainless steel (XCrNi)
Deflector	Stainless steel
Sealing valve	Stainless steel
Glass bulb	Borosilicate glass
Threaded pin	Brass, stainless steel (stainless steel sprinkler)
Seal	Polytetrafluoroethylene (PTFE)

Tab. 7: Material table

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