



Certificates

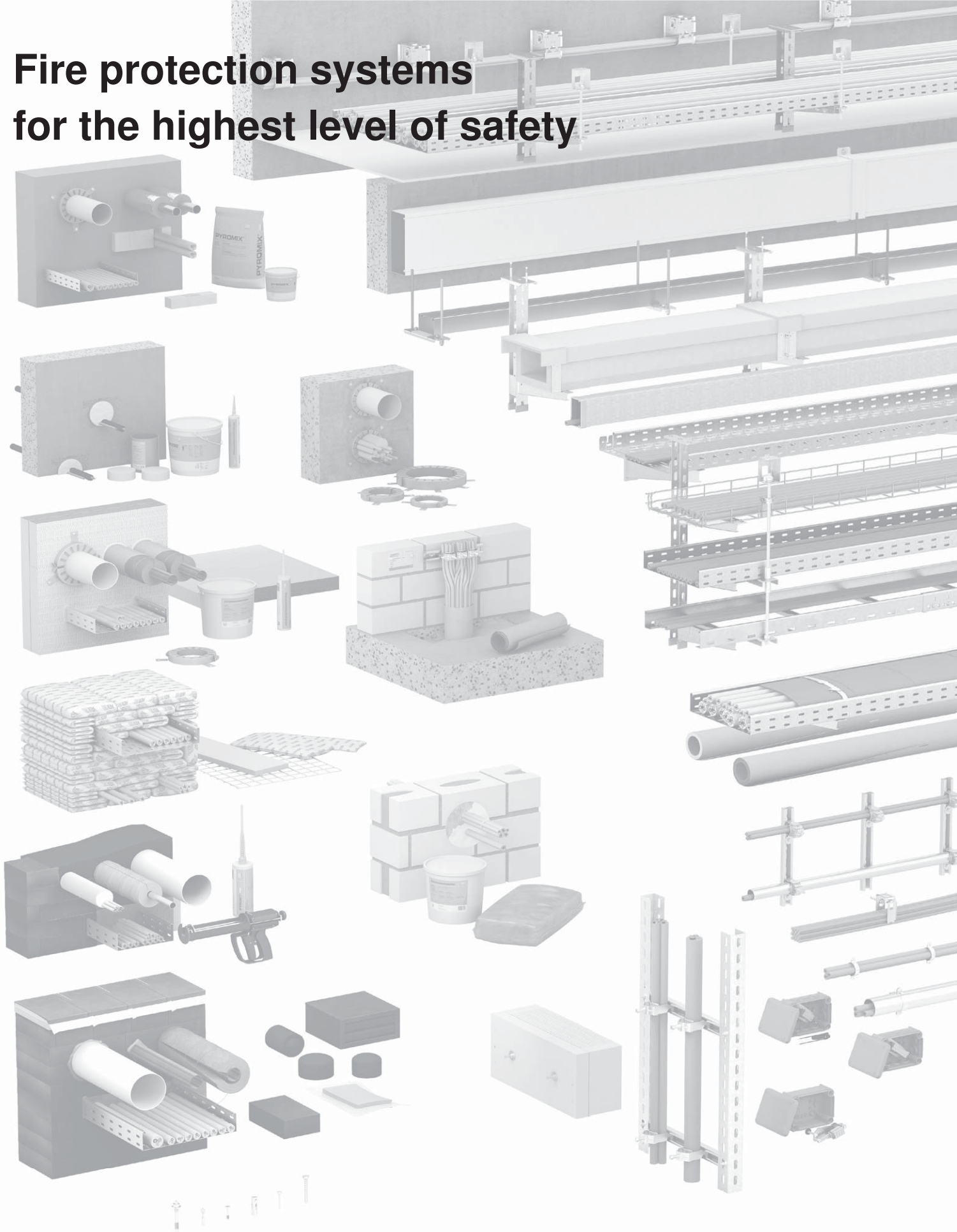


Maintaining electrical functionality

Spacer clips ASG 732, ASL 733; Clamp clips BS-H/U (2056M)

Expert opinion no. GA-2025/003-Nau, valid until 02-02-2030

Fire protection systems for the highest level of safety



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EXPERT OPINION

Document no.:	GA-2025/003 -Nau dated 03.02.2025
Client:	OBO Bettermann Produktion Deutschland GmbH & Co. KG Hüingser Ring 52 58710 Menden
Order date:	19.12.2024
Order symbol:	060041922
Order receipt:	19.12.2024
Content of the order:	Expert opinion on the fire and function behaviour of cable support systems of OBO Bettermann Deutschland GmbH & Co. KG, Menden, with regard to the evaluation as <u>standard support structure according to DIN4102-12:1998-11 for cable routing with cable clips.</u>

This expert opinion comprises 6 pages and 11 annexes.

This expert opinion may only be disseminated in its entirety and unchanged. Excerpts or reductions require the written approval of IBB GmbH Groß Schwülper. Translations of this document not arranged by the IBB GmbH, Groß Schwülper must contain the note "Translation of the original German version not checked by the IBB GmbH, Groß Schwülper". Expert opinions without signature are not valid.

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1 Order and occasion

With order no. 060041922 dated December 19, 2025, IBB GmbH was commissioned by OBO Bettermann Produktion Deutschland GmbH & Co. KG, Menden, to prepare an expert opinion on the fire and functional behaviour of cable support structures manufactured by OBO Bettermann Produktion Deutschland GmbH & Co. KG, Menden, with regard to their classification as “standard support structures” in accordance with DIN 4102-12: 1998-11 for cable routing using cable clamps.

According to DIN 4102-12: 1998-11, the test results achieved on cable systems with integrated functional maintenance can be transferred to tested cable support structures from other manufacturers as an alternative to the tested cable support structures, provided that these can be classified as “standard support structures” within the meaning of DIN 4102-12.

Therefore, this expert opinion shall compare the cable support structure to be assessed – cable routing with cable clips from OBO Bettermann Produktion Deutschland GmbH & Co. KG, Menden – with the design features of the “standard support structure” in accordance with DIN 4102-12.

This expert opinion is then to be used in conjunction with valid, general construction test certificates for cable systems with integrated functional maintenance with “standard support structures” in the building authority procedure.

2 Fundamentals and documents of this expert opinion

The expert opinion on the cable support structure is based on

- [1] DIN 4102-12: 1998-11,
- [2] the test certificates and test reports, as well as general construction test certificates relating to cable systems with integrated functional maintenance in connection with “standard support structure” in accordance with DIN 4102-12 (test reports FIRES-FR-019-11-AUNE, FIRES-FR-024-12-AUNE, FIRES-FR-076-10-AUNE and FIRES-FR-134-13-AUNE as well as general construction test certificates P-MPA-E-06-043, P-MPA-E-06-008, P-MPA-E-09-007, P-MPA-E-06-030 and P-MPA-E-04-019),
- [3] DIN 4102-4: 2016-05,
- [4] the construction drawings relating to the support structures for cable routing with cable clamps in accordance with annexes 1 to 11 to this expert opinion

were used.

In addition to these documents, the author of this expert opinion has incorporated his extensive experience in fire protection technology relating to cable systems with integrated functional integrity into the assessment. The author of this expert opinion has gained over 35 years of professional experience, including management roles at recognized testing institutes.

3 Description of the support structure – cable routing with cable clips

3.1 General information

Only the fire protection and functional integrity details are described below.

This expert opinion is intended to evaluate the supporting structure—cable clips manufactured by OBO Bettermann Produktion Deutschland GmbH & Co. KG, Menden—with regard to “standard support structures” in accordance with DIN 4102-12 in terms of fire protection and functional maintenance.

The steel components of the supporting structure subjected to tensile and shear stresses must be designed in such a way that a maximum steel stress of $\sigma \leq 9 \text{ N/mm}^2$ (E 30) or $\sigma \leq 6 \text{ N/mm}^2$ (E 90) or $\tau \leq 15 \text{ N/mm}^2$ (E 30) or $\tau \leq 10 \text{ N/mm}^2$ (E 90) is not exceeded.

The supporting structure must be fastened to solid structures using fasteners that are designed for the corresponding load and have been tested for fire protection.

3.2 Individual routing with clamber clips and long trough (ceiling and wall routing)

The following section with Table 1 below describes the relevant design details of the cable support structure for cable laying with clamp clip 2056 types BS-H1-M, BS-H2-M, BS-H3-M, and BS-U1-M in conjunction with long trays 2058 LW... on wall and ceiling structures with a maximum mounting distance of 600 mm.

Further design details on the cable tray structures with long troughs can be found in Appendices 1 - 3 and 7 to this expert opinion, so that a further description is not necessary.

Table 1: Construction features clamp clips and long troughs

Cable support structure manufacturer	OBO Bettermann Produktion Deutschland GmbH & Co. KG	
Subject of design (clamp clips with long troughs)	Individual installation with clamp clip and long troughs: 2056 type BS-H1-M, BS-H2-M, BS-H3-M, and BS-U1-M in combination with long troughs type 2058 LW (ceiling, horizontal, and vertical wall installation)	
Maximum distance cable clips	[mm]	600
Length of the long trough	[mm]	200
Maximum span (free passage) of the cable	[mm]	400
Specification of the clamp clips and long trough	-	See Appendices 1- 3 and 7
Specification of the mounting rail (c profile)	-	See Appendices 1 - 3 and 7

3.3 Individual routing with clamp clips (ceiling and wall routing)

The following section with Table 2 below describes the relevant design details of the cable support structure for cable installation with clamp clip 2056 types BS-H1-M, BS-H2-M, BS-H3-M, and BS-U1-M on wall and ceiling structures with a maximum mounting distance of 300 mm.

Further design details on the cable tray constructions can be found in Appendices 4 - 6 and 8 to this expert opinion, so that a further description is not necessary.

Table 2: Construction features clamp clips

Cable support structure manufacturer	OBO Bettermann Produktion Deutschland GmbH & Co. KG	
Subject of design (single clip)	Individual installation with clamp clips: 2056 type BS-H1-M, BS-H2-M, BS-H3-M, and BS-U1-M (ceiling, horizontal, and vertical wall installation)	
Maximum distance cable clips	[mm]	300
Specification of the cable clips	-	see Appendices 4 - 6 and 8
Specification of the mounting rail (c profile)	-	see Appendices 4 - 6 and 8

3.4 Individual routing with spacer clips (ceiling and wall routing)

The following section with Table 3 below describes the relevant design details of the cable support structure for cable routing with ASG 732... and ASL 733... spacer clamps on wall and ceiling structures with a maximum mounting distance of 300 mm.

Further design details on the clamp constructions can be found in Appendices 10–11 to this expert opinion, so that no further description is necessary.

Table 3: *Construction features spacer clamps*

Cable support structure manufacturer	OBO Bettermann Produktion Deutschland GmbH & Co. KG	
Subject of design (single clip)	Individual installation with spacer clips: ASG 732... and type ASL 733... (Ceiling, horizontal, and vertical wall installation)	
Maximum distance cable clips	[mm]	300
Specification of the cable clips	-	See Appendices 10 -11

4 Fire protection and function maintenance evaluation

Tables 1 - 3 summarize the key design features of the support structure to be assessed - cable clips. The supporting structure with cable clips to be assessed in accordance with section 3 can be readily evaluated as a “standard support structure” in accordance with DIN 4102-12 [1], provided that the general conditions specified in section 3 are complied with.

5 Summary

Cable systems with integrated functional maintenance using cable support structures with cable clamps in accordance with section 3 can only be classified in conjunction with valid, general construction test certificates from a recognized material testing institute. In each individual case, it must be checked whether the functional maintenance classes of the cable systems with integrated functional maintenance with support structures - cable clips, as verified in the general construction test certificates, have been achieved in accordance with the “standard support structures” of DIN 4102-12 [1].

6. Special notes

6.1 This expert opinion can be used in conjunction with the corresponding general construction test certificate in the building inspection procedure as the basis for the certificate of conformity, as the deviations from the above-mentioned certificate are assessed as “insignificant” in terms of fire protection. The manufacturer of the construction is responsible for issuing a certificate of conformity for the construction (with the note that the construction is a “non-significant” deviation from the construction principles and boundary conditions according to the above fire protection certificate).

- 6.2 This expert opinion applies only to functional maintenance and fire protection. Further requirements may arise from the technical building regulations applicable to cable systems with integrated functional maintenance and the respective state building regulations or regulations for special structures, e.g., building physics, statics, electrical engineering, ventilation technology, etc.
- 6.3 The overall fire protection concept is not the subject of this expert opinion.
- 6.4 The above fire protection assessment only applies if the load-bearing (load-dissipating and stiffening) components have at least the same fire resistance duration as the cable systems with integrated functional maintenance.
- 6.5 Changes and additions to design details (derived from this expert opinion) are only possible after consultation with IBB GmbH.
- 6.6 Proper execution is the sole responsibility of the executing companies.
- 6.7 The validity of this expert opinion expires on February 2, 2030, and may be extended upon request depending on the state of the art.

This document does not replace any proof of conformity or usability within the meaning of building regulations (national/European).

Standard support structure cable clips

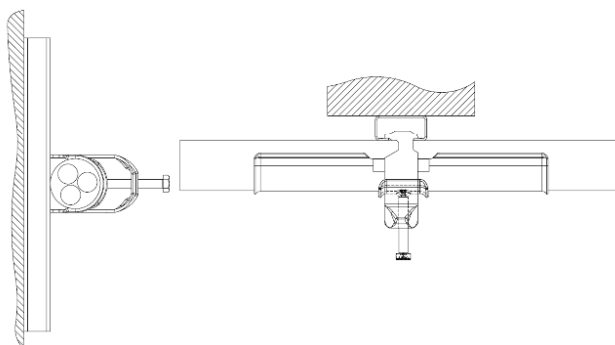


Cable routing with clamp clip 2056, Type BS-H1-M-... and long troughs Type 2058 LW...

Horizontal wall- and ceiling mounting (fastening distance max. 60 cm)

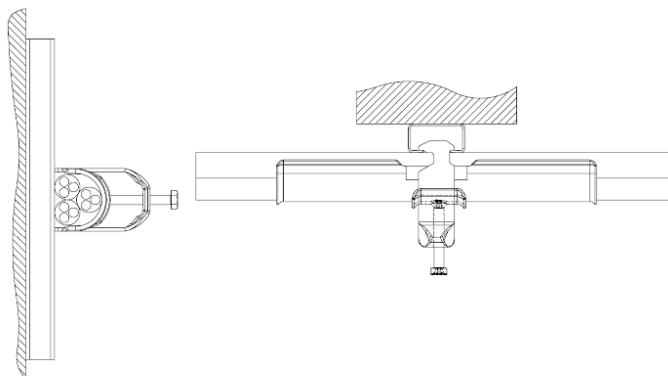
1. Single cable routing

Power cable / Installation cable, diameter not limited



2. Bundle cable routing

Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable
Installation cable max. 3,0 kg/m, diameter not limited



Permitted profile rails:

- CML 3518P...
- CMS 3518P...
- AML 3518P...
- AMS 3518P...

Standard support structure cable clips



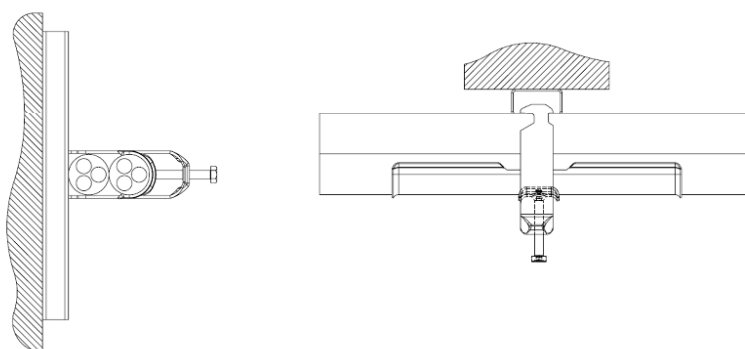
Cable routing with clamp clip 2056, Type BS-H2-M-... and long troughs Type 2058 LW...

Horizontal wall- and ceiling mounting (fastening distance max. 60 cm)

1. Bundle cable routing

Power cable max. 2 pieces for each clamp, diameter max. 25 mm each cable

Installation cable max. 3,0 kg/m, diameter not limited



Permitted profile rails:

- CML 3518P...
- CMS 3518P...
- AML 3518P...
- AMS 3518P...

Standard support structure cable clips



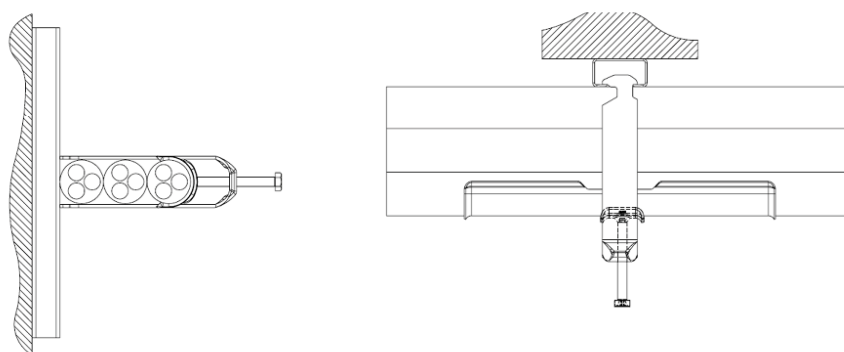
Cable routing with clamp clip 2056, Type BS-H3-M-... and long troughs Type 2058 LW...

Horizontal wall- and ceiling mounting (fastening distance max. 60 cm)

1. Bundle cable routing

Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable

Installation cable max. 3,0 kg/m, diameter not limited



Permitted profile rails:

- CML 3518P...
- CMS 3518P...
- AML 3518P...
- AMS 3518P...

Standard support structure cable clips



Cable routing with clamp clip 2056, Type BS-H1-M-...

1. Single cable routing

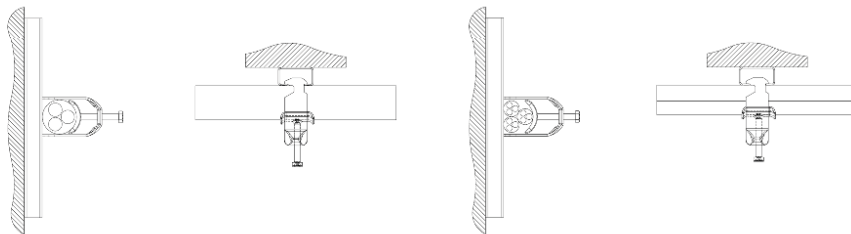
Power cable / Installation cable, diameter not limited

2. Bundle cable routing

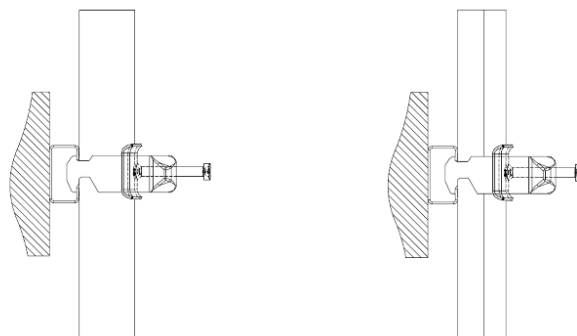
Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable

Installation cable max. 3,0 kg/m, diameter not limited

Horizontal wall- and ceiling mounting (fastening distance max. 30 cm)



Vertical wall installation (fastening distance max. 30 cm)



Permitted profile rails:

- CML 3518P...
- CMS 3518P...
- AML 3518P...
- AMS 3518P...

Standard support structure cable clips

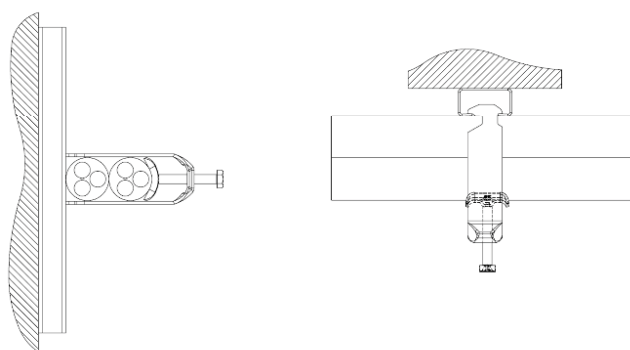


Cable routing with clamp clip 2056, Type BS-H2-M-...

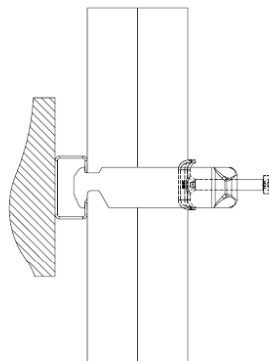
1. Bundle cable routing

Power cable max. 2 pieces for each clamp, diameter max. 25 mm each cable
Installation cable max. 3,0 kg/m, diameter not limited

Horizontal wall- and ceiling mounting (fastening distance max. 30 cm)



Vertical wall installation (fastening distance max. 30 cm)



Permitted profile rails:

- CML 3518P...
- CMS 3518P...
- AML 3518P...
- AMS 3518P...

Standard support structure cable clips

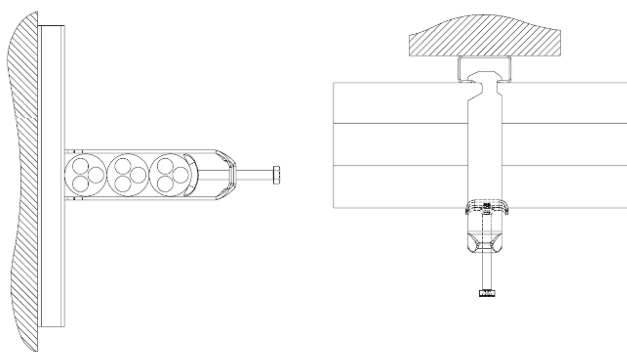


Cable routing with clamp clip 2056, Type BS-H3-M-...

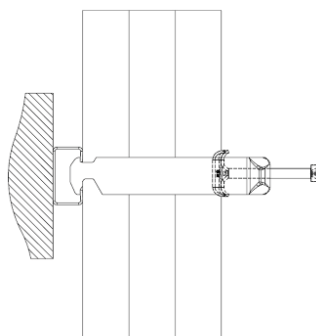
1. Bundle cable routing

Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable
Installation cable max. 3,0 kg/m, diameter not limited

Horizontal wall- and ceiling mounting (fastening distance max. 30 cm)



Vertical wall installation (fastening distance max. 30 cm)



Permitted profile rails:

- CML 3518P...
- CMS 3518P...
- AML 3518P...
- AMS 3518P...

Standard support structure cable clips

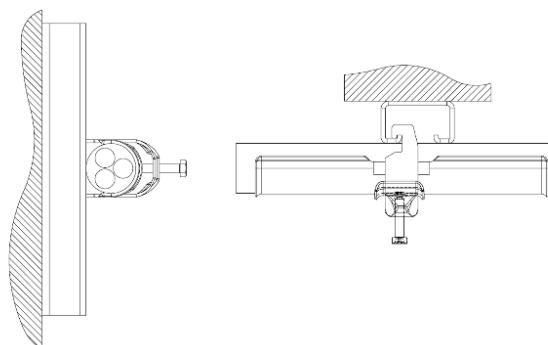


Cable routing with clamp clip 2056, Type BS-U1-M-... and long troughs Type 2058 LW...

Horizontal wall- and ceiling mounting (fastening distance max. 60 cm)

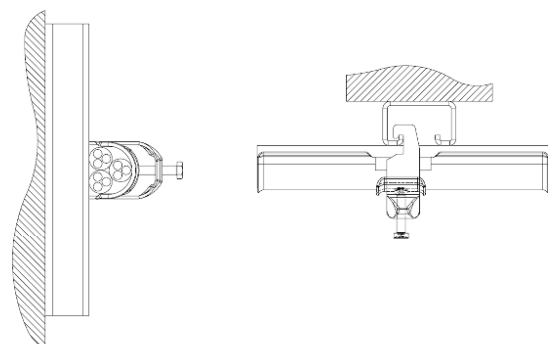
1. Single cable routing

Power cable / Installation cable, diameter not limited



2. Bundle cable routing

Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable
Installation cable max. 3,0 kg/m, diameter not limited



Permitted profile rails:

- MS4022P...
- MS5030P...
- MS4121P...
- MSL4141P...
- MS4141P...

Standard support structure cable clips



Cable routing with clamp clip 2056, Typ BS-U1-M-...

1. Single cable routing

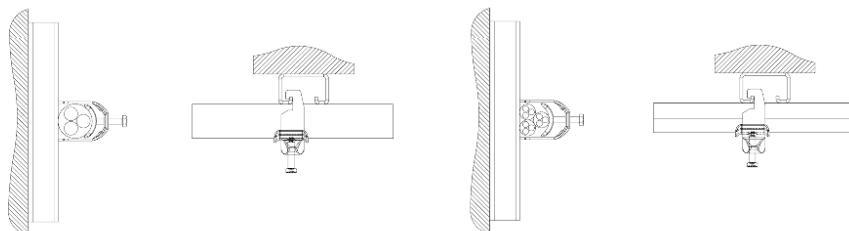
Power cable / Installation cable, diameter not limited

2. Bundle cable routing

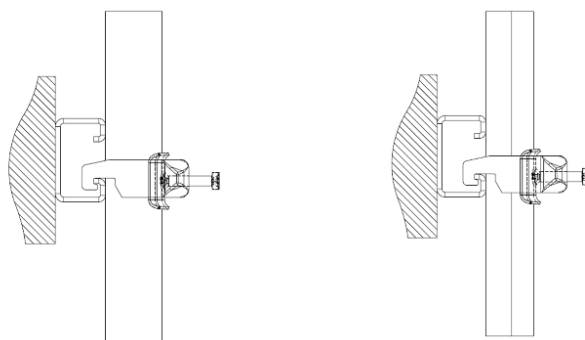
Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable

Installation cable max. 3,0 kg/m, diameter not limited

Horizontal wall- and ceiling mounting (fastening distance max. 30 cm)



Vertical wall installation (fastening distance max. 30 cm)



Permitted profile rails:

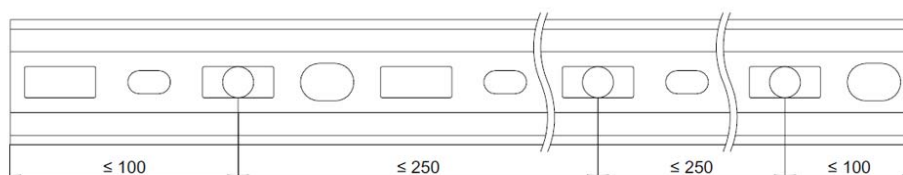
- MS4022P...
- MS5030P...
- MS4121P...
- MSL4141P...
- MS4141P...

Standard support structure cable clips



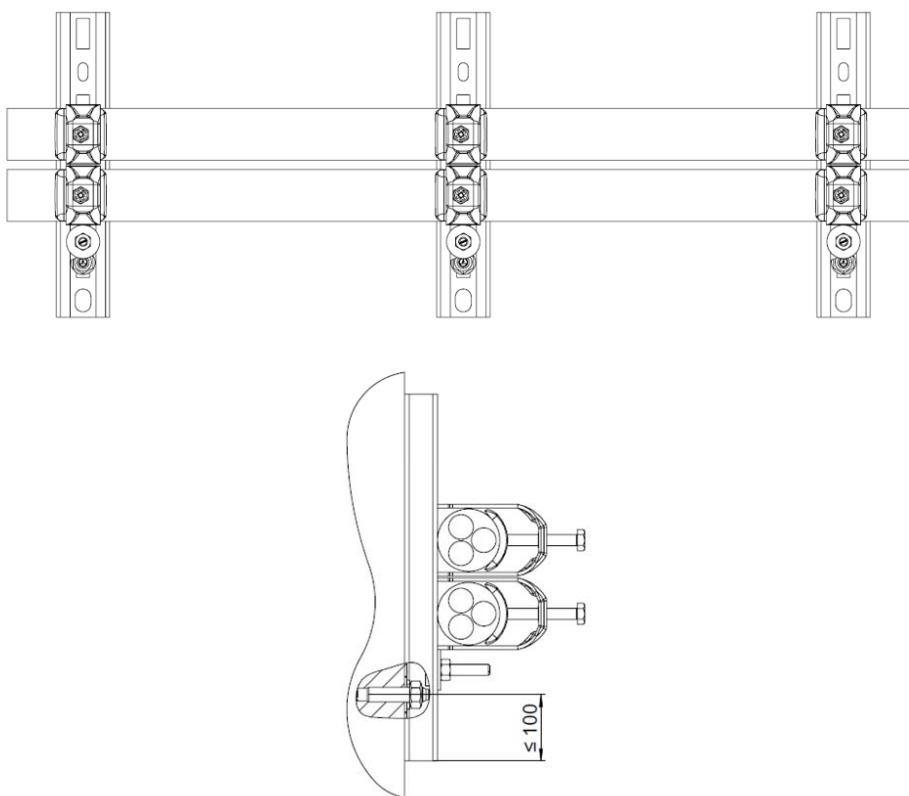
Fastening of the profile rail

Fastening with suitable and approved fasteners in case of fire.



Cable routing with clamp clip 2056

Observe slip protection for horizontal wall mounting



Standard support structure cable clips



Cable routing with spacer clip type ASG 732

1. Single cable routing

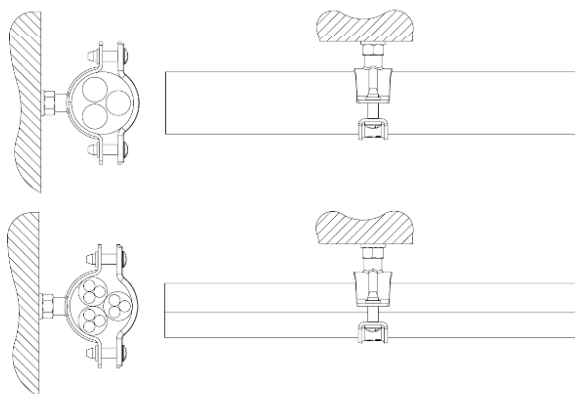
Power cable / Installation cable, diameter not limited

2. Bundle cable routing

Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable

Installation cable max. 3,0 kg/m, diameter not limited

Horizontal wall- and ceiling mounting (fastening distance max. 30 cm)



Vertical wall installation (fastening distance max. 30 cm)



Standard support structure cable clips



Cable routing with spacer clip type ASL 733

1. Single cable routing

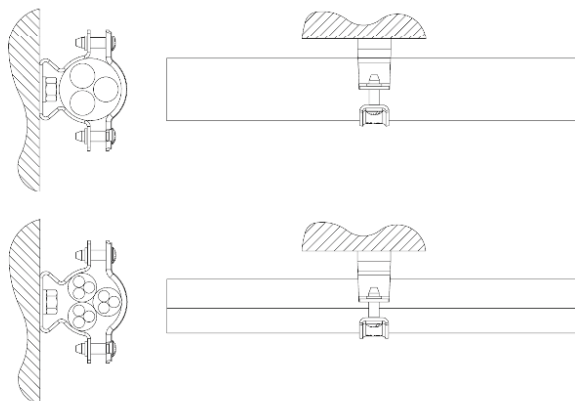
Power cable / Installation cable, diameter not limited

2. Bundle cable routing

Power cable max. 3 pieces for each clamp, diameter max. 25 mm each cable

Installation cable max. 3,0 kg/m, diameter not limited

Horizontal wall- and ceiling mounting (fastening distance max. 30 cm)



Vertical wall installation (fastening distance max. 30 cm)







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