# Certificates

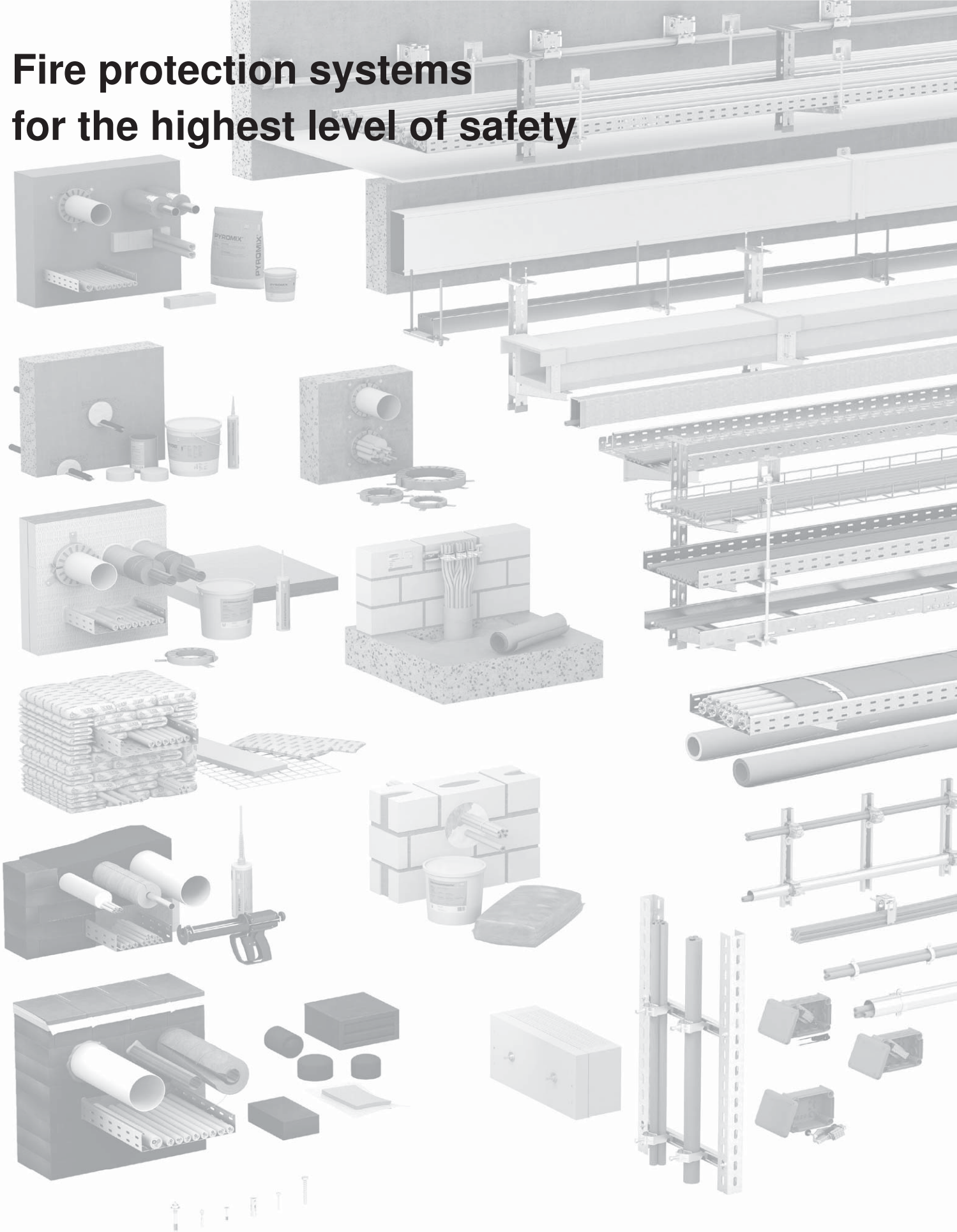
## Maintaining electrical functionality

## Fastening clips types 1015, 1015 OL, 1015 D, 1015 D OL

Expert opinion no. GA-2023/112-Nau, valid until 14-04-2030

OBO BETTERMANN

# Fire protection systems for the highest level of safety




Be it in a residential building or an industrial complex – OBO has the appropriate solution for fireproof electrical installations. Our tested and certified fire protection systems cover all the relevant fire protection guidelines and provide you with an electrical installation that really serves its purpose.
We will be happy to provide you with more details – on our website or personally.

**EXPERT OPINION**

| | |
|---|---|
| **Document no.:** | GA-2023/112 – Nau dated 14.04.2025 |
| **Client:** | OBO BETTERMANN Produktion Deutschland GmbH & Co. KG<br>Hüingser Ring 52<br>D-58710 Menden |
| **Order date:** | 14.04.2025 |
| **Order receipt:** | 14.04.2025 |
| **Content of the order:** | Expert opinion on the fire and functional behaviour of cable support structures made 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, when cables are laid using type 1015, 1015 OL, 1015 D and 1015 D OL fastening clips. |

This expert opinion has 6 pages incl. cover sheet and 7 annexes.

## Table of Contents

## 1 Order and occasion

With order number 060046236, IBB GmbH was commissioned by OBO Bettermann Produktion Deutschland GmbH & Co, Menden on 14.04.2025 to prepare an expert opinion on the fire and functional behaviour of cable support structures with regard to their classification as standard support structures in accordance with DIN 4102-12: 1998-11, when cables are laid using type 1015, 1015 OL, 1015 D and 1015 D OL fastening clips.

According to DIN 4102-12: 1998-11, test results achieved by cable systems with integrated maintenance of electrical function can be transferred to tested cable support structures made by other manufacturers, as an alternative to the tested cable support structures themselves, provided that these can be considered standard support structures in the sense of DIN 4102-12.

That is why this expert opinion aims to compare the cable support structure being assessed – cables laid using individual type 1015, 1015 OL, 1015 D and 1015 D OL clips made by OBO Bettermann Produktion Deutschland GmbH & Co. KG, Menden – with the design features of the standard support structure defined in DIN 4102-12.

This expert opinion will then be used in conjunction with valid, general building authority test certificates for cable systems with integrated maintenance of electrical function using standard support structures in the building authority planning procedure.

## 2 Fundamentals and documents of this expert opinion

This expert opinion is based upon the following fundamentals and documents:

(1) DIN 4102-12: 1998-11,

(2) The following test reports determining the maintenance of electrical function of cable systems according to DIN 4102-12 using type 1015 and 1015D fastening clips, each issued to OBO Bettermann GmbH & Co. KG, Menden:

- 210006560-1 by MPA NRW dated 22.01.2014
- 21006560-2 by MPA NRW dated 17.02.2014
- 21006560-3 by MPA NRW dated 19.03.2014
- FIRES-FR-007-18-AUNE by FIRES s.r.o., Slovakia;

(3) General building authority test certificates concerning cable systems with integrated maintenance of electrical function in conjunction with standard support structures as defined in DIN 4102-12.

(4) DIN 4102-4: 2016-05

(5) The construction drawings of support structures for laying cables with individual clips as well as the associated data sheets provided in Annexes 1 to 7 of this expert opinion.

In addition to these documents, extensive fire protection experience of the author of this expert opinion regarding cable systems with integrated maintenance of electrical function is included in the assessment. The author of this expert opinion has gained more than 35 years

of professional experience, for example within the scope of managerial activities at recognized testing institutes.

## 3 Description of the support structure – laying cables using individual type 1015, 1015 OL, 1015 D and 1015 D OL clips

### 3.1 General

Only the technical details relating to fire and maintenance of electrical function are described below. This expert opinion aims to evaluate the support structure consisting of type 1015, 1015 OL, 1015 D and 1015 D OL fastening clips made by OBO Bettermann Produktion Deutschland GmbH & Co. KG, Menden, regarding its categorisation as a "standard support structure" as defined in DIN 4102-12, in terms of fire protection and the maintenance of electrical function.

The steel components of supporting structures subjected to tensile and shear stresses must be designed so that a maximum steel stress of $\sigma \leq 9$ N/mm² (E30) or $\sigma \leq 6$ N/mm² (E90) or $T \leq 15$ N/mm² (E30) or $T \leq 10$ N/mm² (E90) on the basis of Table 11.1 of (5) is not exceeded.

The fastening clips type 1015 and 1015 D must be attached to solid structures using ≤ M6 fasteners designed for the relevant load and proven in terms of fire protection.

The fastening clips type 1015 OL and 1015 D OL must be attached to solid structures using setting bolts or nails with gas or battery-powered setting tools or concrete nail guns that have been approved for the corresponding load in terms of fire protection.

### 3.2 Type 1015, 1015 OL, 1015 D and 1015 D OL fastening clips for attaching cables to solid ceilings and walls

Cables for the maintenance of electrical function should be fixed to solid ceilings and walls using type 1015, 1015 OL, 1015 D and 1015 D OL fastening clips (double clips) at a distance of ≤ 300 mm. It should be possible to fix the cables horizontally to walls and ceilings. Furthermore, it should be possible to fix them vertically on walls.

Further structural details of the aforementioned fastening clips can be found in annexes 1 to 7, so that no further description is necessary.

## 4 Fire protection and functional maintenance assessment

According to the submitted test reports (2), numerous fire tests have been conducted on cable systems with integrated maintenance of electrical function using type 1015 and 1015D fastening clips, pursuant to DIN 4102-12. A range of different cables were tested while mounted horizontally on walls and ceilings, each with a clip spacing of 60 cm.

According to section 7.3.3.3 of DIN 4102-12, a single installation with single clips is considered a standard support structure, provided the clips have a width of 15 mm (± 5 mm). For this purpose, the maximum fastening distance is defined as 30 cm. The design of the single clip is not defined or described in any further detail.

The tested type 1015 clips have a width of 12-14 mm, depending on size. The aforementioned requirement of DIN 4102-12 is therefore easily met in this respect. The fire tests were carried out with a clip spacing of 60 cm, which was twice as far as defined by DIN 4102-12 for a standard support structure with single clips. The basic usability of this clip is for the maintenance of electrical function, and its mechanical load-bearing capacity, were thus sufficiently demonstrated.

Section 8.3 of DIN 4102 part 12 contains information regarding the vertical installation of cables with maintenance of electrical function. According to that information, single clips tested for ceiling installation can also be used for vertical cable installation. The maximum cable fastening distance must be 30 cm, corresponding to the horizontal ceiling installation.

Since the type 1015 clips have also been tested beneath ceilings, the specifications of the standard regarding the use of clips for vertical cable routing are also fulfilled without difficulty.

Therefore, from the point of view of fire protection and the maintenance of electrical function, there are no concerns to consider type 1015, 1015 OL, 1015 D and 1015 D OL clips from being considered standard support structures for both horizontal and vertical cable routing on walls as defined in DIN 4102-12.

The load-bearing construction involving type 1015, 1015 OL, 1015 D and 1015 D OL fastening clips described in Section 3 can be considered a "standard load-bearing construction" pursuant to DIN 4102-12 (1), provided that the conditions specified in the following sections are complied with.

## 5 Summary

A classification of cable systems with integrated maintenance of electrical function when using cable support structures as defined in section 3 can only be done in conjunction with valid, general building authority test certificates issues by a recognised material testing institute. It must be checked in each individual case whether the maintenance of electrical function classes of the cable systems with integrated maintenance of electrical function with support structures – individual clips, which correspond to the "standard support structures" of DIN 4102-12 (1), have been achieved, as verified in the general building authority test certificates.

## 6 Special notes

- This expert opinion can be used in conjunction with the corresponding general building authority test certificate in the building authority approval procedure, as the basis for proof of conformity, since the divergences from the above-mentioned proof are considered “not significant” in terms of fire protection. The manufacturer of the construction is responsible for issuing a certificate of compliance for the construction, stating that the construction produced is a “non-substantial” divergence from the construction principles and peripheral conditions defined in the aforementioned fire protection certificate.
- This expert opinion only concerns the maintenance of electrical function and fire protection. Further requirements may arise from the technical building regulations applicable to cable systems with integrated maintenance of electrical function and the relevant state building regulations or regulations for special buildings – e.g. structural physics, structural engineering, electrical engineering, ventilation technology and similar.
- The overall fire protection concept is not the subject of this expert opinion.
- 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 maintenance of electrical function.
- Changes and additions to construction details (derived from this expert opinion) are only permitted after consulation with IBB GmbH.
- Proper execution is the sole responsibility of the executing companies.
- This opinion ceases to be vaild on 14. April 2030 but may be extended upon request, provided it remains technically up-to-date.

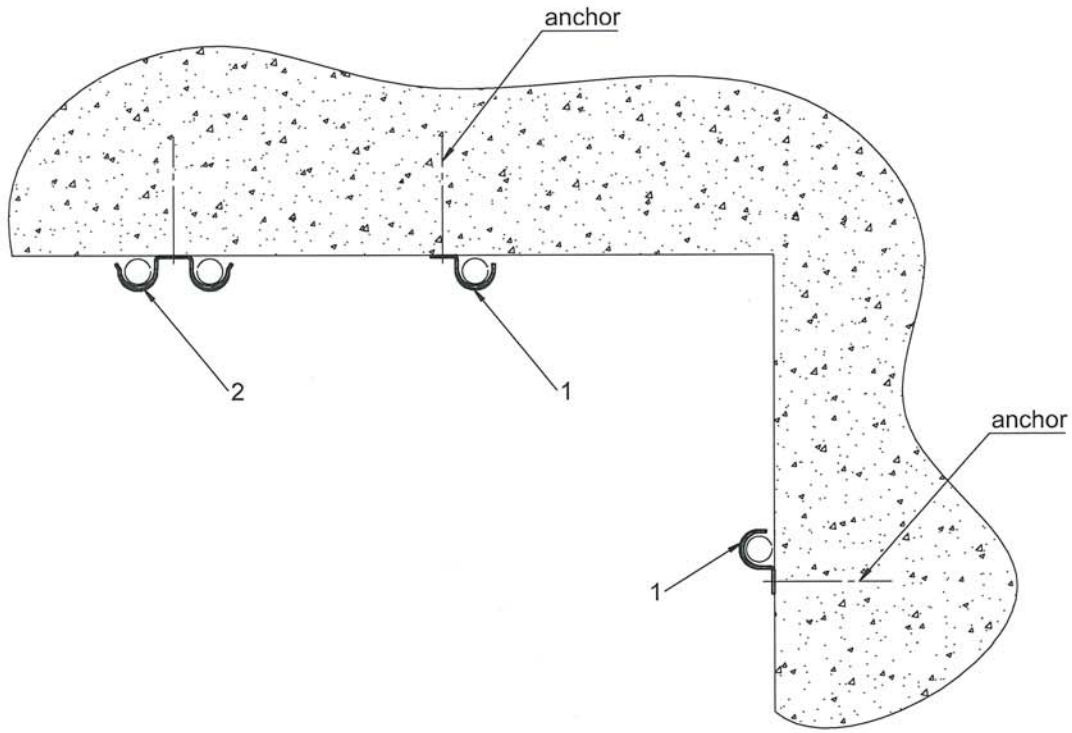
This document does not replace a certificate of conformity or usability as stipulated by the building regulations (National / European).

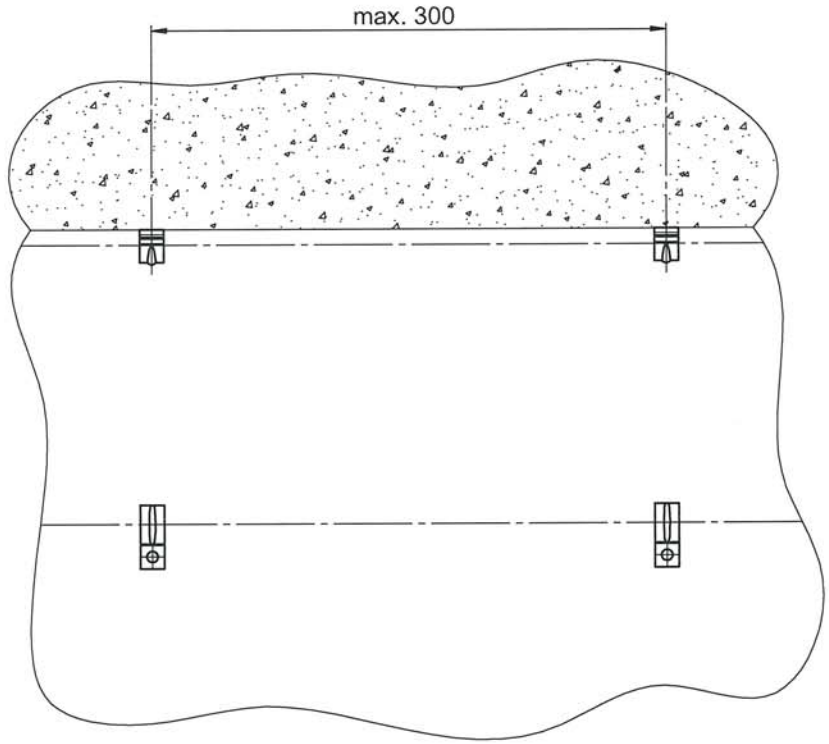
Best regards

Dr.-Ing. Peter Nause

Fire Protection Expert

# Wall and ceiling mounting, horizontal cable routing




| Pos. Pos. | Stck. Pcs. | Benennung Description | Art.- / Hafa-Nr. Art.- / Hafa-No. | Zchng.-Nr. / Normteil Drwg.-No. / Standard | Werkstoff / Bemerkung Material / Comment |
|---|---|---|---|---|---|
| 2 | | fastening clamp | Typ: 1015 D ... | | St galvanised |
| 1 | | fastening clamp | Typ: 1015 ... | | St galvanised |

surface:
color:
allowance:
weight:

material:
batch:

Released

assembly drawing
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Einzelschelle, 1015 ...
to:
Funktionserhalt-Systeme, nach DIN 4102-12

OBO Bettermann Produktion Deutschland GmbH & Co. KG

| | EN | Date | name |
|---|---|---|---|
| creator | | 25.06.24 | C. Noertemann |
| editor | | 25.06.24 | C. Noertemann |
| tested | | 06.11.18 | S. Febbe |

scale 1:3

| Ind. | amendment article | Date | name |
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| Ind. | amendment drawing | Date | name |
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| a doc. | english translation<br>sheet 3 and 4 added | 25.06.24<br>cno | |

PE 05 200 | PF | article-number 05200-132691

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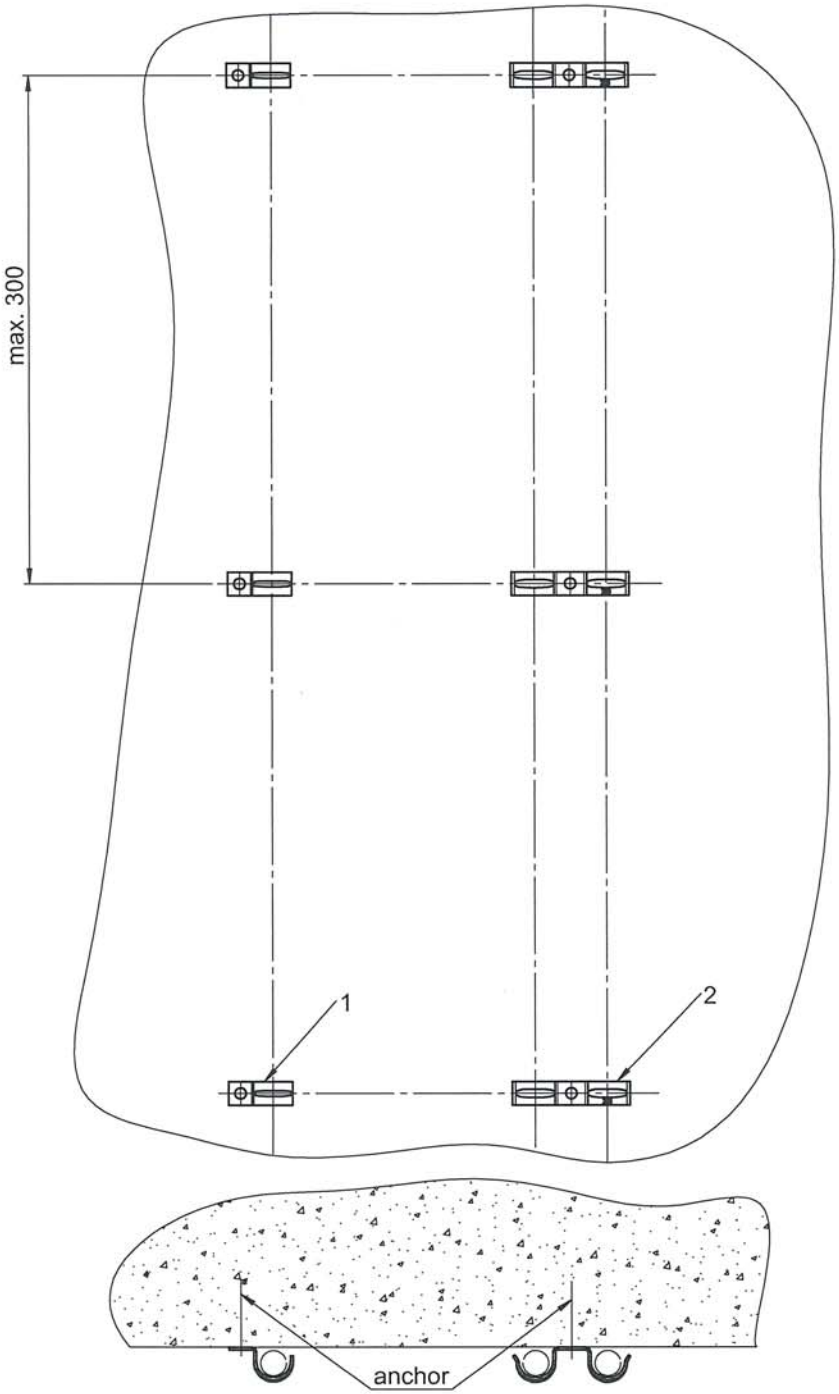
drawing-no: 132691 | version a/1 | sheet 3/4 | sheet size A3

# Wall mounting, vertical cable routing




| Pos. Pos. | Stck. Pcs. | Benennung Description | Art.- / Hafa-Nr. Art.- / Hafa-No. | Zchng.-Nr. / Normteil Drwg.-No. / Standard | Werkstoff / Bemerkung Material / Comment |
|---|---|---|---|---|---|
| 2 | | fastening clamp | Typ: 1015 D ... | | St galvanised |
| 1 | | fastening clamp | Typ: 1015 ... | | St galvanised |

surface:
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assembly drawing
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Einzelschelle, 1015 ...
to:
Funktionserhalt-Systeme, nach DIN 4102-12

OBO Bettermann Produktion Deutschland GmbH & Co. KG

| | EN | Date | name |
|---|---|---|---|
| creator | | 25.06.24 | C. Noertemann |
| editor | | 25.06.24 | C. Noertemann |
| tested | | 08.11.18 | S. Fobbe |

scale 1:3

| Ind. | amendment article | Date | name |
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| Ind. | amendment drawing | Date | name |
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| a doc. | english translation ---------- sheet 3 and 4 added | 25.06.24 | cno |

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# Data sheet

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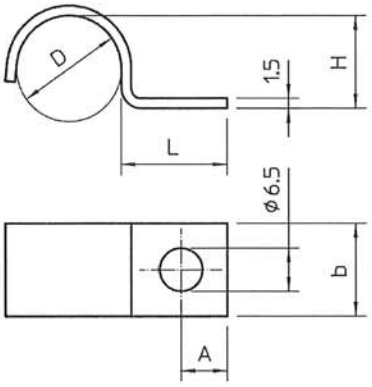
## Fastening clip type 1015




Material: steel, galvanised

| Type | D | L | H | b | A |
|---|---|---|---|---|---|
| 1015/5 | 5 mm | 16 mm | 4 mm | 12 mm | 7 mm |
| 1015/6 | 6 mm | 16 mm | 5 mm | 12 mm | 7 mm |
| 1015/7 | 7 mm | 16 mm | 6 mm | 12 mm | 7 mm |
| 1015/8 | 8 mm | 16 mm | 7 mm | 12 mm | 7 mm |
| 1015/9 | 9 mm | 16 mm | 8 mm | 12 mm | 7 mm |
| 1015/10 | 10 mm | 16 mm | 9 mm | 12 mm | 7 mm |
| 1015/11 | 11 mm | 16 mm | 10 mm | 14 mm | 7 mm |
| 1015/12 | 12 mm | 16 mm | 11 mm | 14 mm | 7 mm |
| 1015/13 | 13 mm | 16 mm | 12 mm | 14 mm | 7 mm |
| 1015/14 | 14 mm | 16 mm | 12,5 mm | 14 mm | 7 mm |
| 1015/15 | 15 mm | 16 mm | 13,5 mm | 14 mm | 7 mm |
| 1015/16 | 16 mm | 16 mm | 14 mm | 14 mm | 7 mm |
| 1015/17 | 17 mm | 16 mm | 15 mm | 14 mm | 7 mm |
| 1015/18 | 18 mm | 16 mm | 16 mm | 14 mm | 7 mm |

# Data sheet

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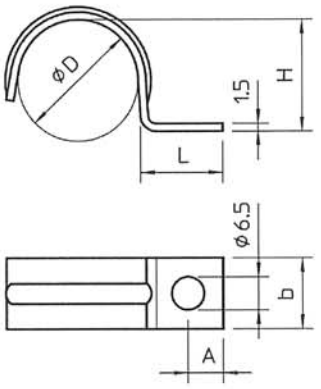
## Fastening clip type 1015




Material: steel, galvanized

| Type | D | L | H | b | A |
|---|---|---|---|---|---|
| 1015/20 | 20 mm | 16 mm | 18 mm | 14 mm | 7 mm |
| 1015/25 | 25 mm | 16 mm | 22,5 mm | 14 mm | 7 mm |
| 1015/28 | 28 mm | 16 mm | 25 mm | 14 mm | 7 mm |

# **Datenblatt** / *Data sheet*

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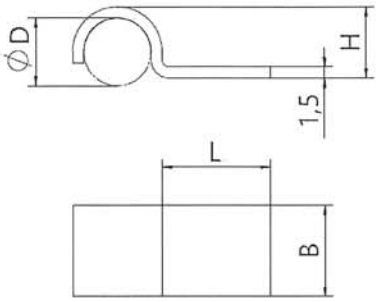
## Befestigungsschelle Typ 1015 OL
*Fastening clip type 1015 OL*




| Typ / *Type* | D | L | H | B |
|---|---|---|---|---|
| 1015 6 OL G | 6 mm | 16 mm | 5 mm | 12 mm |
| 1015 7 OL G | 7 mm | 16 mm | 6 mm | 12 mm |
| 1015 8 OL G | 8 mm | 16 mm | 7 mm | 12 mm |
| 1015 9 OL G | 9 mm | 16 mm | 8 mm | 12 mm |
| 1015 10 OL G | 10 mm | 16 mm | 9 mm | 12 mm |
| 1015 11 OL G | 11 mm | 16 mm | 10 mm | 14 mm |
| 1015 12 OL G | 12 mm | 16 mm | 11 mm | 14 mm |
| 1015 13 OL G | 13 mm | 16 mm | 12 mm | 14 mm |

# Data sheet

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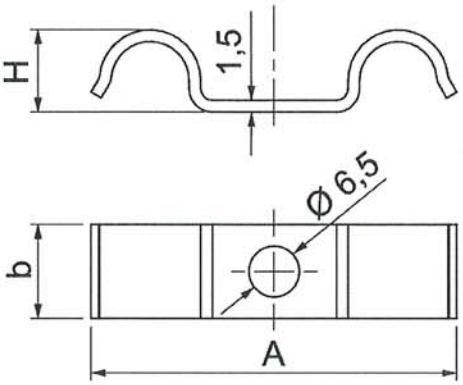
## Fastening clip type 1015D



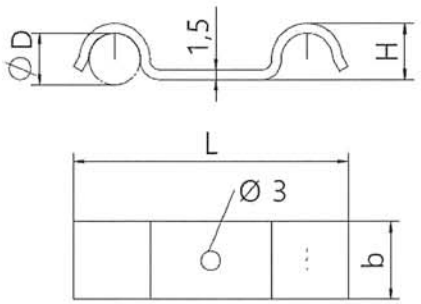

Material: steel, galvanized

Material thickness: 1,5 mm

| Type | D | H | b | A |
|---|---|---|---|---|
| 1015/5 | 5 mm | 6 mm | 12 mm | 33 mm |
| 1015/6 | 6 mm | 7 mm | 12 mm | 35 mm |
| 1015/7 | 7 mm | 8 mm | 12 mm | 41 mm |
| 1015/8 | 8 mm | 9 mm | 12 mm | 43 mm |
| 1015/9 | 9 mm | 10 mm | 12 mm | 45 mm |
| 1015/10 | 10 mm | 1,05 mm | 12 mm | 47 mm |
| 1015/12 | 12 mm | 12 mm | 14 mm | 51 mm |
| 1015/14 | 14 mm | 14 mm | 14 mm | 55 mm |
| 1015/15 | 15 mm | 15 mm | 14 mm | 58 mm |
| 1015/16 | 16 mm | 16 mm | 14 mm | 60 mm |
| 1015/18 | 18 mm | 18 mm | 14 mm | 64 mm |
| 1015/20 | 20 mm | 21 mm | 14 mm | 69 mm |
| 1015/22 | 22 mm | 22 mm | 14 mm | 72 mm |
| 1015/25 | 25 mm | 25 mm | 14 mm | 79 mm |

# **Datenblatt** / *Data sheet*

## Befestigungsschelle Typ 1015 D OL
*Fastening clip type 1015 D OL*




| **Typ** / *Type* | **D** | **H** | **b** | **A** | **d** |
|---|---|---|---|---|---|
| 1015 D 6 OL G | 6 mm | 7 mm | 12 mm | 35 mm | 3 mm |
| 1015 D 7 OL G | 7 mm | 8 mm | 12 mm | 41 mm | 3 mm |
| 1015 D 8 OL G | 8 mm | 9 mm | 12 mm | 43 mm | 3 mm |
| 1015 D 9 OL G | 9 mm | 10 mm | 12 mm | 45 mm | 3 mm |
| 1015 D 10 OL G | 10 mm | 10,5 mm | 12 mm | 47 mm | 3 mm |
| 1015 D 12 OL G | 12 mm | 12 mm | 14 mm | 51 mm | 3 mm |

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