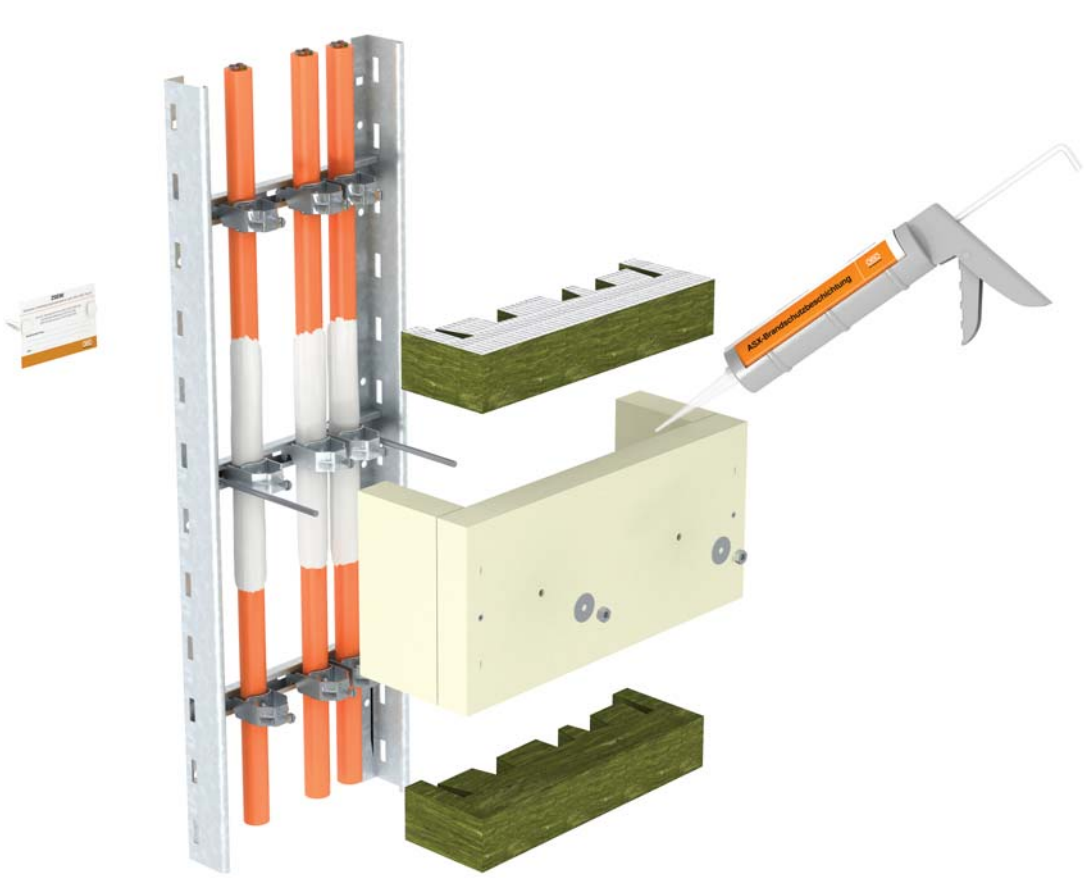


Certificates

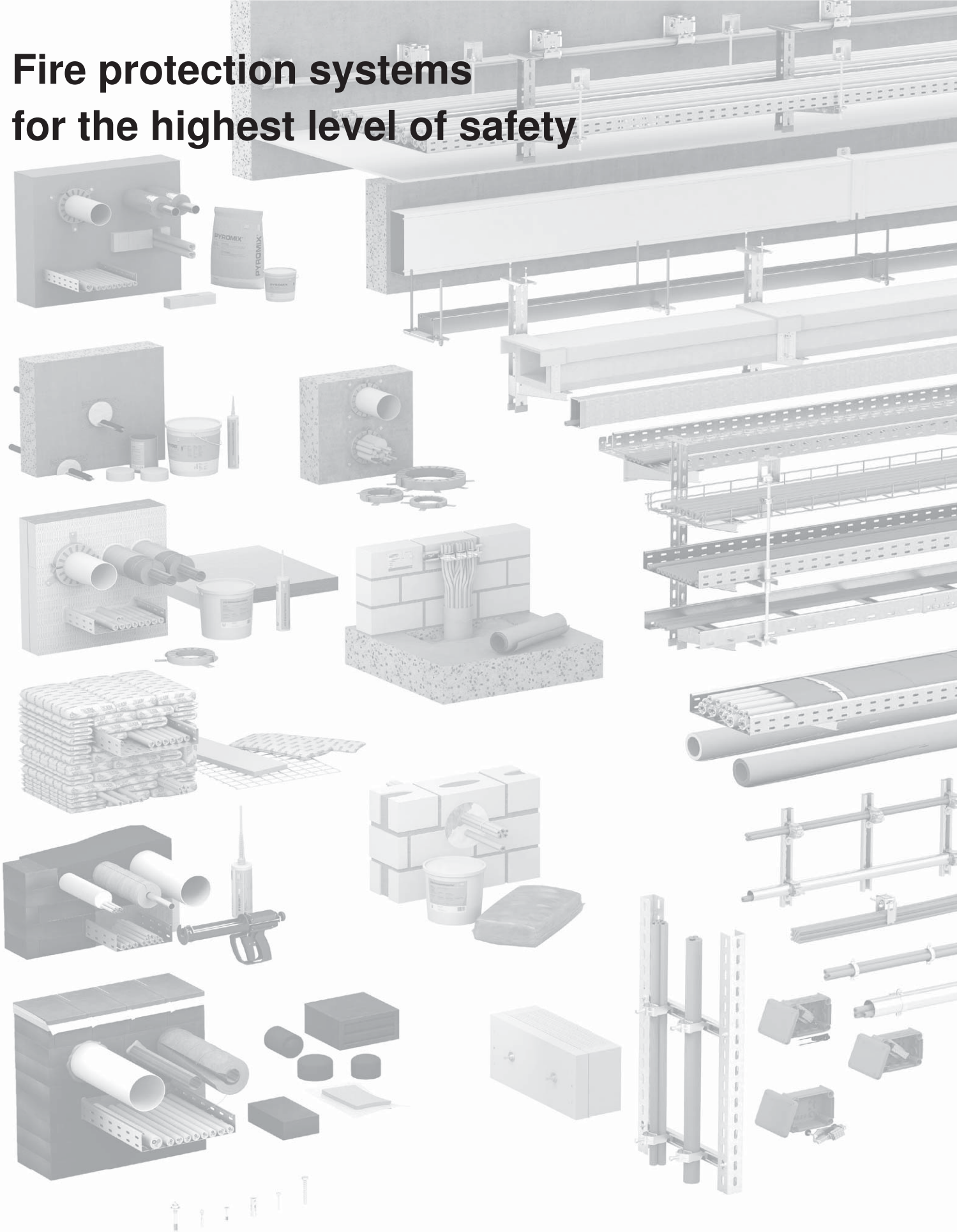
Maintaining electrical functionality

Effective support measures for verticable cable routing

Expert opinion no. GA-2023/116 - Nau, valid until 11-01-2029

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 No. GA-2023/116 -Nau dated 11.01.2024

Client:	OBO BETTERMANN Produktion Deutschland GmbH & Co. KG Hüingser Ring 52 D-58710 Menden
Order date:	14.11.2023
Order No.:	06O026893
Order receipt:	14.11.2023
Content of order:	Expert opinion regarding the fire behaviour of electric cable systems required to maintain circuit integrity according to DIN 4102-12: 1998-11 when using "standard support constructions" for vertical routing of cables in conjunction with effective support measures in terms of section 8.3 of DIN 4102-12.

This expert opinion has 6 pages cover sheet included and 4 annexes

Index

1 Order and occasion

IBB GmbH was commissioned by OBO BETTERMANN Produktion Deutschland GmbH & Co. KG, Menden, with e-mail dated 16 October 2023 to prepare an expert opinion on the reaction to fire behaviour of electric cable systems required to maintain circuit integrity in accordance with DIN 4102-12: 1998-11 when using “standard support constructions” for the vertical routing of cables in conjunction with effective support measures within the meaning of section 8.3 of DIN 4102-12.

The expert opinion is necessary because the electric cable systems required to maintain circuit integrity are not covered in all construction details with regard to effective support measures by fire protection verifications (e.g. “allgemeine bauaufsichtliche Prüfzeugnisse”).

2 Basis and documents of the expert opinion

Basis for the expert opinion on the cable support construction are

(1) various test certificates for the testing of electric cable systems required to maintain circuit integrity, issued to different manufacturers,
(2) expert opinions for vertical routing of cables from MPA Braunschweig issued for different manufacturers with regard to the assessment of the cable support system as „standard support construction“ for vertical routing of cables according to DIN 4102-12: 1998-11 and
(3) the construction drawings according to annexes 1 to 4.

In addition to these documents, the extensive experience concerning fire protection of the author of this expert opinion regarding electric cable systems required to maintain circuit integrity is incorporated into the assessment. The author of this expert opinion gained over 35 years of professional experience, among other things, in the context of managerial activities at approved testing laboratories.

3 Description of electric cable systems required to maintain circuit integrity

3.1 Effective support measures

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

Within the scope of this expert opinion, the variant described below for effective support of the functional integrity cables in accordance with DIN 4102-12:1998-11, section 8.3, when using "standard support constructions" for installation on profile rails with clamp clips, for single clip installation as well as for vertical routing of cables, is to be evaluated in terms of fire protection.

According to the information provided by the client, the fasteners of the cables (e.g. single clips or clamp clips) are protected by a 140 mm to 180 mm thick, max. 200 mm long and 740 mm wide housing. Depending on the functional integrity duration of the cable system the housing consists of fire protection boards and the mineral wool board penetration seal with additional mineral wool filling (non-combustible, melting point 1000° C, filling density or raw density ≥ 100 kg/m²) that is arranged around the cable entries and exits. The design of the mineral wool penetration seal is based on the applicable "allgemeine Bauartgenehmigung (aBG)" for mixed penetration seals with a fire resistance duration of 90 minutes (fire resistant). The mineral wool board is coated on the external surface with an intumescent or ablation coating in accordance with the specifications of the "allgemeine Bauartgenehmigung aBG)". The cables are also coated inside the housing area. The thickness and raw density of the mineral wool board also correspond to the "allgemeine Bauartgenehmigung (aBG)".

The mounting of the housing to the rigid wall can be carried out in three different ways. In variant 1 the fastening is made by threaded rods which are held on the vertical routing of cables or profile rail (see annex 2). In variant 2 the threaded rods are anchored directly into the rigid wall, each to the side of the cable system (see annex 3). In variant 3, steel angles are doweled to the rigid wall inside or outside the housing (see annex 4). Steel angles that are arranged on the outside must be covered with a 100 mm wide cover strip of the fire protection board.

Further construction details can be found in annexes 1 to 4 to this expert opinion, so that no further description is required.

3.2 Cable support constructions („standard support construction" for vertical routing of cables)

The cables are installed on profile rails with clamp clips, on vertical routings or with single clips in accordance with an "allgemeinen bauaufsichtlichen Prüfzeugnis" or in accordance with an expert opinion for vertical routing of cables.

No further description of the cable support constructions is given and reference is made to the corresponding "allemeine bauaufsichtliche Prüfzeugnisse" or to expert opinions for vertical routing of cables, as the electric cable systems are designed in accordance with the boundary conditions and construction principles of the corresponding verifications.

3.3 Cable construction types

According to the client, electric cable construction types with integrated functional integrity for the respective required functional integrity class for installation types for vertical routing of cables should be designed on the basis of “allgemeiner bauaufsichtlicher Prüfzeugnisse”, so that no deviations result from this.

4 Assessment with regard to fire protection

Based on the available test results and experiences, there are no concerns about the implementation of the effective support measures according to section 3 as well as the annexes 1-4 to this expert opinion compared to the specifications in section 8.3 of DIN 4102-12 in terms of functional integrity and fire protection, so that the strain relief of the electric cable systems required to maintain circuit integrity are fulfilled equally under fire exposure due to the cable sheathings otherwise burning down.

Based on the available test results as well as further testing experience on electric cable systems required to maintain circuit integrity of OBO BETTERMANN Produktion Deutschland GmbH & Co. KG, Menden, the electric cable system required to maintain circuit integrity of vertical routing of cables in conjunction with effective support measures according to section 3 can be classified in

Functional integrity classes „E30“, „E60“ or „E90“ according to DIN 4102-12 : 1998-11

in case of fire exposure according to the standard temperature-time curve (ETK), when

- a functional integrity class "E30", "E60" or "E90" (depending on the cables used) according to DIN 4102-12 : 1998-11 is available for the installed cable types for the installation type "vertical routing of cables", "profile rails with clamp clips" or "single clamp installation".
- an “allgemeines bauaufsichtliches Prüfzeugnis“ for the cable support constructions or an expert opinion for vertical routing of cables is available and
- otherwise, the boundary conditions and construction principles of the corresponding “allgemeine bauaufsichtliche Prüfzeugnisse” for electric cable systems required to maintain circuit integrity in conjunction with the expert opinions for vertical routing of cables ("standard support construction") are met.

The effective support measures of electric cable systems required to maintain circuit integrity which are described in section 2 and shown in annexes 1-4, do not represent a significant deviation from classified constructions if the above-mentioned boundary conditions are complied with.

This expert opinion can be used together with the corresponding “allgemeines bauaufsichtliches Prüfzeugnis” for electric cable systems required to maintain circuit integrity in conjunction with the expert opinions for vertical routing of cables ("standard support construction") in the building regulation procedure.

5 Special information

5.1 This expert opinion can be used in conjunction with the corresponding “allgemeines bauaufsichtliches Prüfzeugnis” in the building regulation procedure as basis for the certificate of conformity (Übereinstimmungsnachweis), as the deviations from the above-mentioned certificate are assessed as "not significant" in terms of fire protection. The issue of a certificate of conformity for the construction (with the note that the construction created is a "non-significant" deviation from the construction principles and boundary conditions in accordance with the above-mentioned fire protection certificate) is the responsibility of the manufacturer of the construction.

5.2 This expert opinion is only applying in the terms of functional integrity and fire protection. Further requirements may arise from the technical building regulations applicable to the electric cable systems required to maintain circuit integrity and the respective state building regulations (*Landesbauordnung*) or the regulations for special buildings -i.e. building physics, statics, electrical engineering, ventilation technology or similar.

5.3 The overall fire protection concept is not the subject of this expert opinion.

5.4 The above-mentioned fire protection assessment is only valid, if the load-bearing (load-distributing or reinforcing) building elements have at least the same fire resistance class as the electric cable systems required to maintain circuit integrity.

5.5 Changes and additions to construction details (derived from this expert opinion) are only possible after consultation with IBB GmbH.

5.6 The proper execution is the sole responsibility of the executing company.

5.7 The validity of this report ends on 11 January 2029 and can be extended upon request depending on the state of the art.

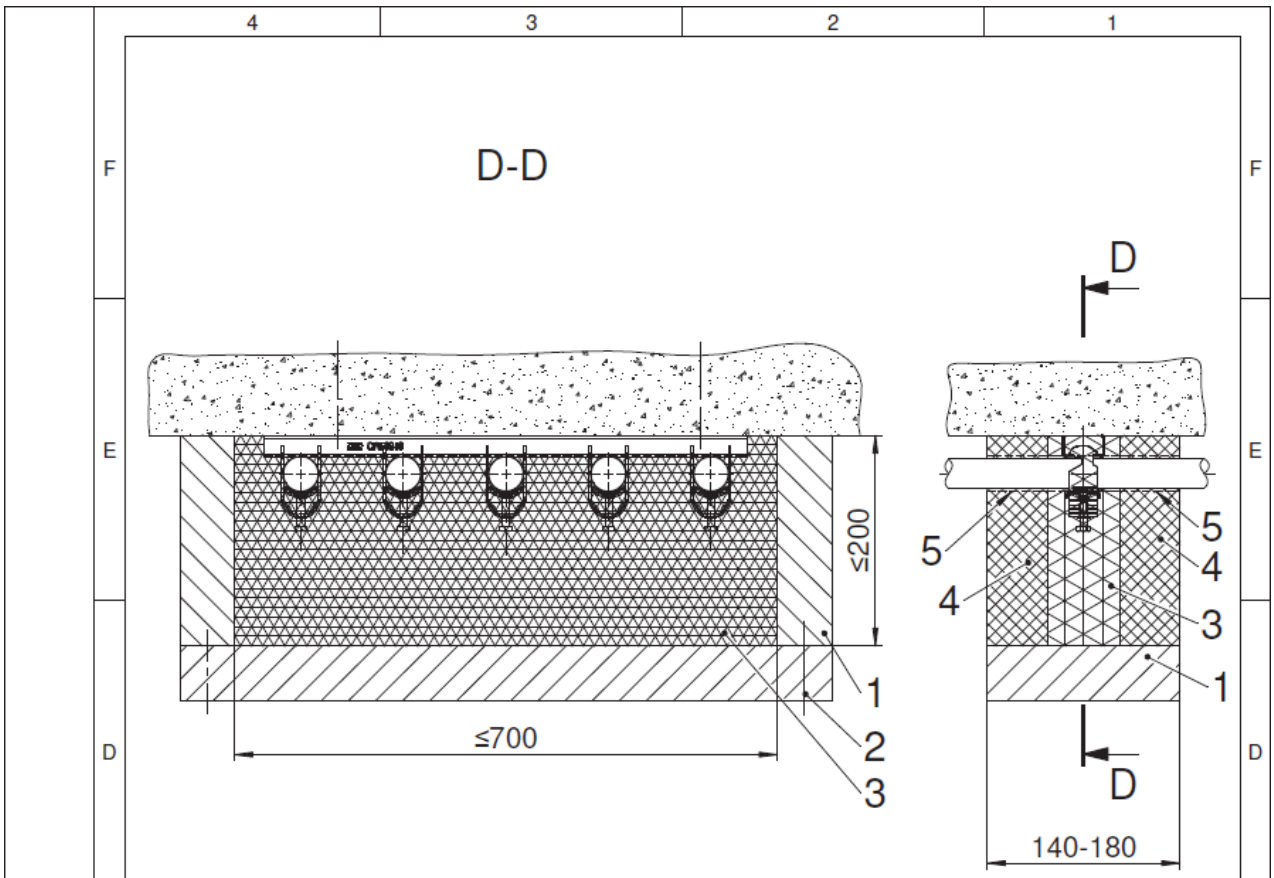
This document does not replace a declaration of conformity or proof of usability (*Konformitäts- oder Verwendbarkeitsnachweis)* within the meaning of the "Bauordnung" (*building regulations*) (National/European).

Best regards

Dr.-Ing. Peter Nause
Expert for fire protection

Translation of the original German version not checked by "IBB GmbH, Groß Schwülper". This translation was commissioned by OBO Bettermann Produktion Deutschland GmbH & Co. KG. This translation is only for better understanding in other countries. In cases of doubt, the original German version of the expert opinion applies exclusively.

Date of translation of this Expert Opinion: 25.03.2024



Pos. Pos.	Stck. Pcs.	Benennung Description	Art.- / Hafa-Nr. Art.- / Hafa-No.	Zchng.-Nr. / Normteil Drwg.-No. / Standard	Werkstoff / Bemerkung Material / Comment
5	-	fire protection compound	Insulation layer images or ablation coating		
4	2	mineral fibre plate	one-sided with fire protection compound coating		
3	1	mineral wool			meltingpoint > 1000°C
2	4	countersunk head screwe			4.8x80 steel
1	1	housing			fire protection panels

Oberflaeche: | Farbe: | zulaessige Abweichung: ISO 2768-mK | Gewicht:

Werkstoff:

Batch:

Freigegeben

OBO Bettermann Group

Baugruppenzeichnung
Zugentlastung
für senkrechte Kabelverlegung

zu:
Funktionserhalt-Systeme
Funktionserhalt n. DIN 4102 Teil 12

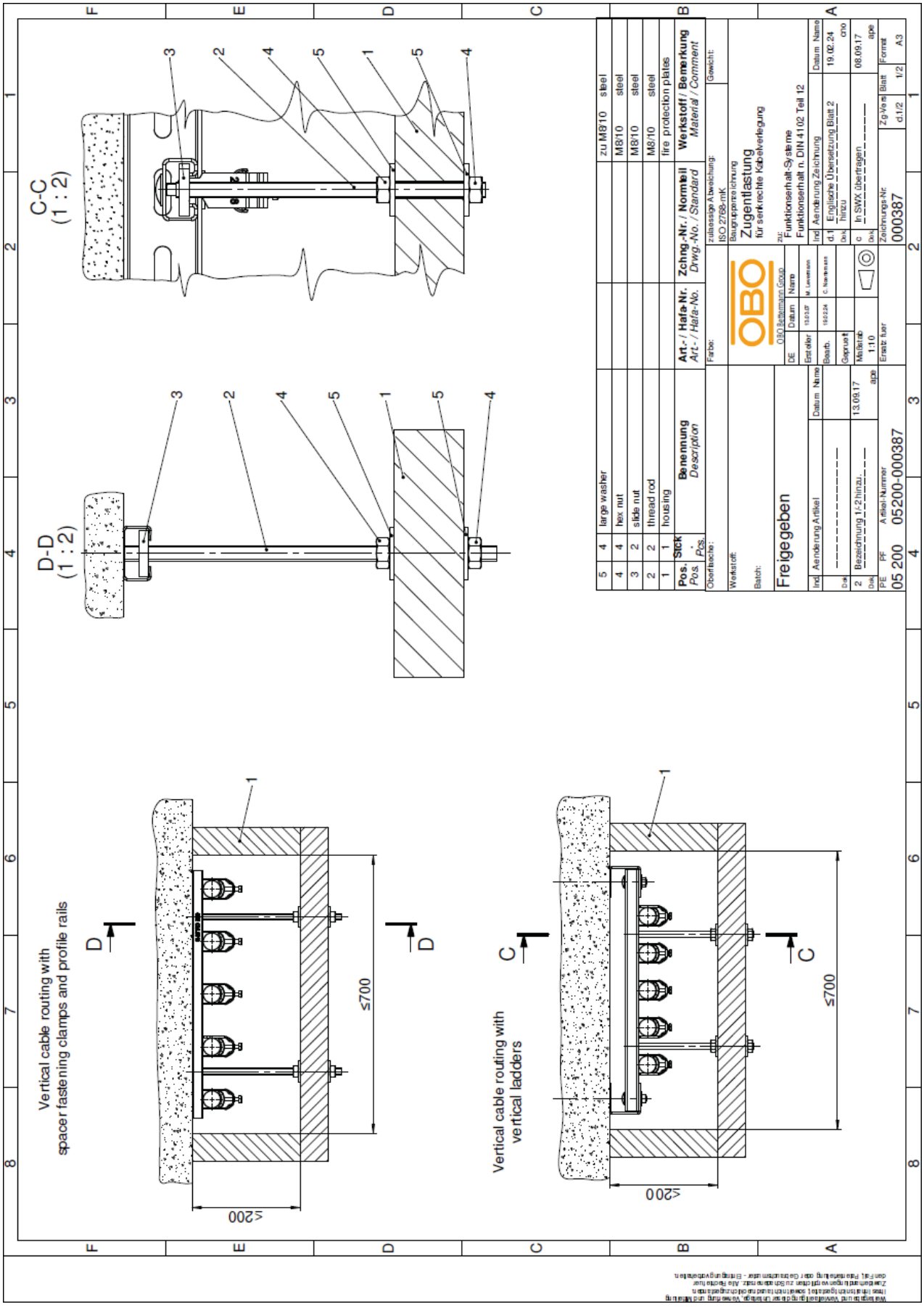
DE	Datum	Name
Ersteller	13.03.07	M. Levermann
Bearb.	19.02.24	C. Noortemann
Geprueft		

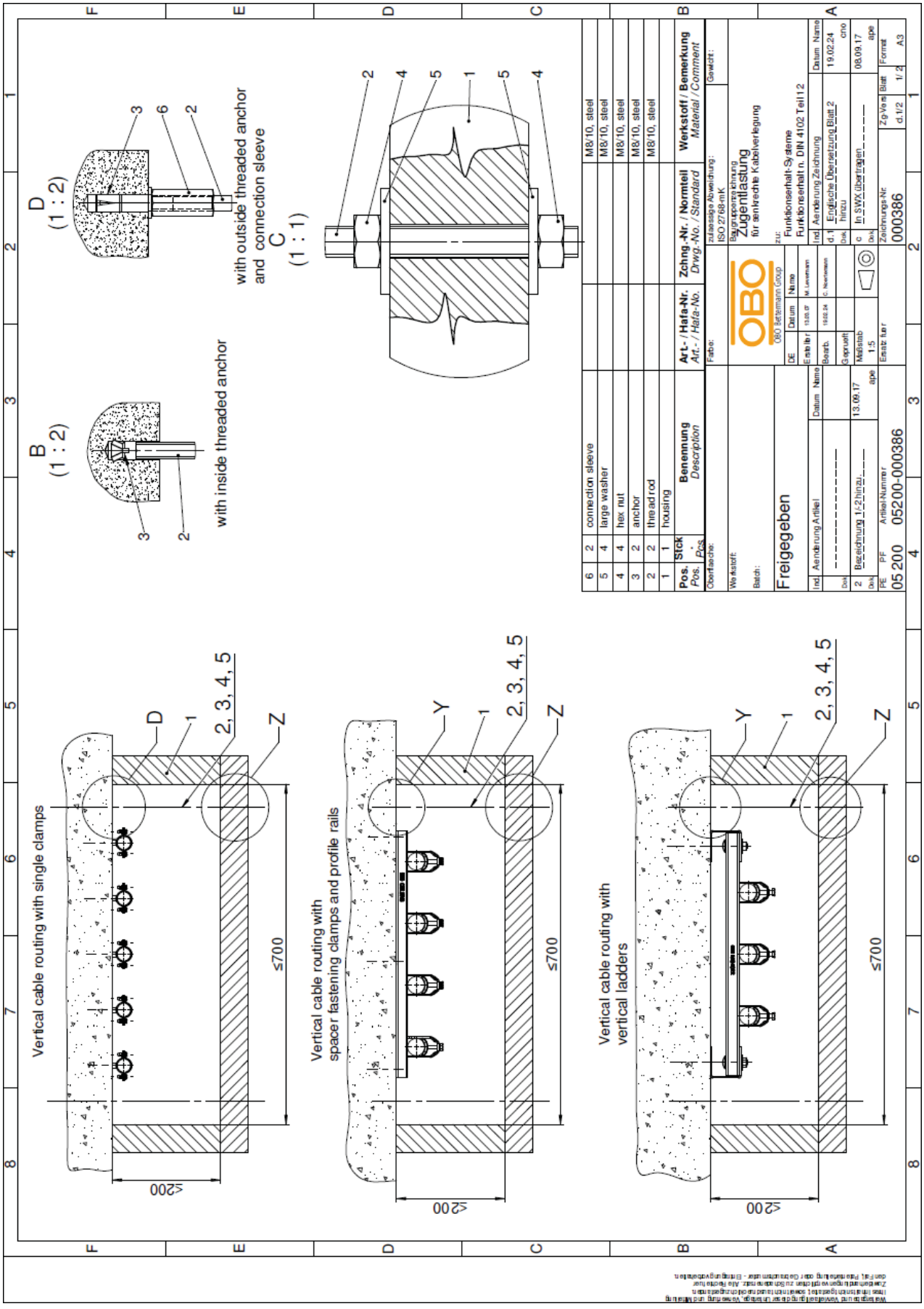
Maßstab 1:10

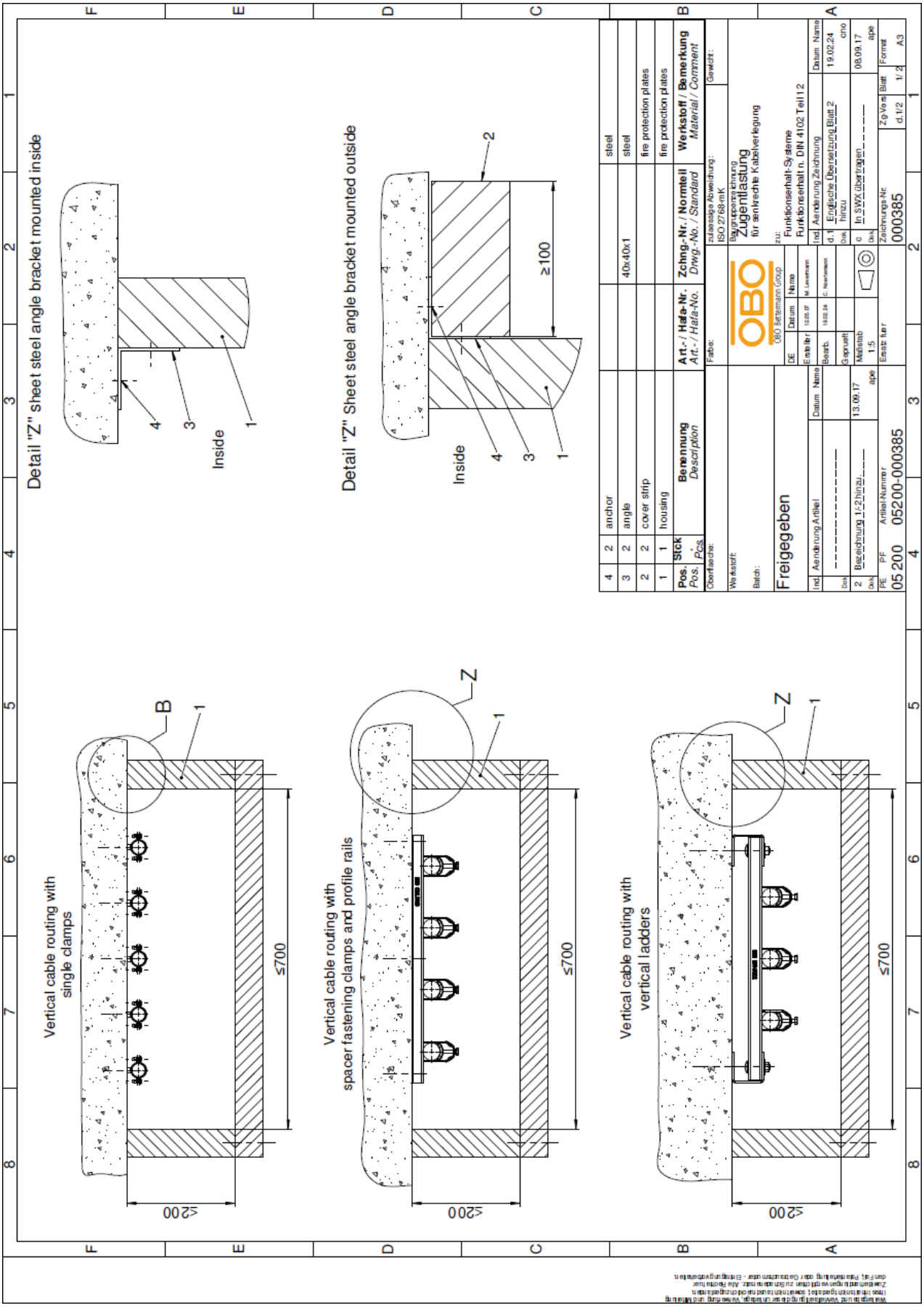
Ind.	Aenderung Artikel	Datum Name
Dok.	----------	
2 Dok.	Bezeichnung 1/-2 hinzu.	13.09.17 ape

Ind.	Aenderung Zeichnung	Datum Name
e.1 Dok.	Englische Übersetzung Blatt 2 hinzu	19.02.24 cno
d Dok.	In SWX übertragen	08.09.17 ape

PE 05 | PF 200 | Artikel-Nummer 05200-000388 | Ersatz fuer | Zeichnungs-Nr: 000388 | Zg-Vers e.1/2 | Blatt 1/2 | Format A4


C-C
(1 : 2)
D-D
(1 : 2)
Vertical cable routing with
spacer fastening clamps and profile rails
Vertical cable routing with
vertical ladders
≤700
≤200
Freigegeben
OBO
Zugentlastung
für senkrechte Kabelverlegung
Funktionserhalt-Systeme
Funktionserhalt n. DIN 4102 Teil 12
05 200 05200-000387
000387
Pos. Stck Benennung Description
5 4 large washer zu M8/10 steel
4 4 hex. nut M8/10 steel
3 2 slide nut M8/10 steel
2 2 thread rod M8/10 steel
1 1 housing fire protection plates


B (1 : 2)
with inside threaded anchor
D (1 : 2)
with outside threaded anchor and connection sleeve
C (1 : 1)
Vertical cable routing with single clamps
Vertical cable routing with spacer fastening clamps and profile rails
Vertical cable routing with vertical ladders
≤200
≤700
Freigegeben
OBO Bettermann Group
Zugentlastung
für senkrechte Kabelverlegung
Funktionserhalt-Systeme
Funktionserhalt n. DIN 4102 Teil 12
Pos. Stck Benennung Art.- / Hafa-Nr. Zchng.-Nr. / Normteil Werkstoff / Bemerkung
6 2 connection sleeve M8/10, steel
5 4 large washer M8/10, steel
4 4 hex nut M8/10, steel
3 2 anchor M8/10, steel
2 2 thread rod M8/10, steel
1 1 housing
05 200 05200-000386
Zeichnungs-Nr: 000386


Detail "Z" sheet steel angle bracket mounted inside
Inside
Detail "Z" Sheet steel angle bracket mounted outside
≥100
Inside
Vertical cable routing with single clamps
≤700
≤200
Vertical cable routing with spacer fastening clamps and profile rails
≤700
≤200
Vertical cable routing with vertical ladders
≤700
≤200
Freigegeben
OBO Bettermann Group
Funktionserhalt-Systeme
Funktionserhalt n. DIN 4102 Teil 12
Zugentlastung
für senkrechte Kabelverlegung
05200-000385
000385

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Building Connections