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CNBOP-PIB NATIONAL TECHNICAL ASSESSMENT CNBOP-PIB-KOT-2018/0056-3703 issue 1

Pursuant to the Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on national technical assessments (Dz. U. 2016, item 1968) as a result of the proceedings to issue a National Technical Assessment carried out in the Scientific and Research Centre for Fire Protection - National Research Institute (CNBOP-PIB) in Józefów near Otwock at the request of the company:

BAKS Wytwarzanie Osprzętu Instalacyjno – Elektrotechnicznego
Kazimierz Sielski
ul. Jagodne 5
05-480 Karczew

we hereby issue a positive assessment of the performance for the intended use of the construction product under the name:

BAKS cable systems
(cable support structures with electric conductors and cables) in the circuit integrity maintenance class
E30, E60, E90 according to DIN 4102-12
Manufacturer of support structures: BAKS

Manufacturers of conductors and cables: BITNER, DÄTWYLER, ELKOND, EUPEN, NEXANS, FACAB LYNEN, PRAKAB, STUDER, TECHNOKABEL, TELE-FONIKA KABLE, MADEX, KABLOTEK, ELPAR, NKT

with the purpose, scope, conditions and terms specified in the Annex, which is an integral part of this CNBOP-PIB National Technical Assessment.

Validity date

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Deputy Director
for certification and approvals

brig. dr inż. Jacek Zboina

Annex
General and technical provisions

Józefów, 29 May 2018

The CNBOP-PIB-KOT-2018/0056-3703 National Technical Assessment, Issue 1 contains 95 pages. Copying
the National Technical Assessment is only allowed in full. Copying, publishing or disseminating in any other form (also electronic) of the fragments of the National Technical Assessment requires a written agreement with the Scientific and Research Centre for Fire Protection - National Research Institute.

ANNEX

TABLE OF CONTENTS

1. Technical description of the Product
- 1.1 General technical characteristics of the product
- 1.2 Classification
- 1.3 Marking

2. Intended use of the product
- 2.1 Purpose
- 2.2 Usage scope and conditions, restrictions
- 2.3 Installation

3. Product performance characteristics and methods applied to their assessment
- 3.1 Design
- 3.2 Functional Requirements
- 3.3 Technical/environmental requirements

4. Packaging, transport, storage and method of marking of the product
- 4.1 Packaging
- 4.2 Storage
- 4.3 Transport
- 4.4 Marking

5. Assessment and verification of constancy of performance
- 5.1 General principles
- 5.2 Factory production control (FPC)
- 5.3 Initial type testing
- 5.4 End product testing
- 5.5 Test methods
- 5.6 Collection of samples for tests
- 5.7 Evaluation of test results

6. Legal instruction

7. List of documents used in the proceedings

Annexes

ADDITIONAL INFORMATION

GENERAL AND TECHNICAL PROVISIONS

1 TECHNICAL DESCRIPTION OF THE PRODUCT

1.1 General technical characteristics of the product

The subject of this National Technical Assessment are BAKS cable systems (cable supporti structures with electric conductors and cables) with the circuit integrity maintenance class E30, E60, E90 according to DIN 4102-12 – sets of products consisting of BAKS cable support structures and cables produced by the manufacturers indicated in Table 2.

BAKS cable systems ensure the **continuity of power supply in fire conditions** for the time required for starting up and operating fire[1] protection equipment and are classified in **the circuit integrity maintenance class E30, E60 or E90** according to DIN 4102-12, depending on the type and type of the cable support structure used and the type of cable used.

The maintenance of the integrity of the cable system is understood as its ability to maintain continuous transmission of electrical energy and IT signals (e.g. in emergency power supply circuits) at the fire temperature determined by the standard curve (ETK) for 30 or 90 minutes and under static rated load.

BAKS cable systems include:

- Standard systems which are constructed according to section 7.3.3.3 of DIN 4102-12:1998,
- Special (above-standard) systems which have parameters other than those specified in section 7.3.3.3 of DIN 4102-12:1998 with regard to the fixing method, material thickness, type of substrate, type of material and type of coating, e.g. mesh trays, structures with a larger spacing of suspension points, etc.

The assessment of BAKS cable systems in the scope of maintaining circuit integrity (continuity of electrical power supply or signal transmission), taking into account the type of substrate and expected fixing method, is performed in accordance with the conditions specified in the Polish Standard for Fire Resistance Testing PN-EN 1363-1 - Fire resistance tests - Part 1. General requirements and DIN 4102-12 Fire performance of construction materials and components – Part 12: Maintenance of the circuit integrity of cable systems – Requirements and tests. The test procedure for standard and special cable systems is compliant with the DIN 4102-12:1998 standard.

The scope of application of BAKS cable systems is limited to cables with a rated voltage of 1 kV.

BAKS cable systems may, **with reservation to section 2.2 of this National Technical Assessment**, include BAKS cable support structure elements listed in Table 1 and designated cable types produced by the manufacturers listed in Table 2.

Annex 1 contains the drawings of standard BAKS cable support structures and classifications of cable systems according to DIN 4102-12, depending on the used configuration of the standard cable supporting structure and cable.

Annex 2 contains the drawings of special BAKS cable support structures and classifications of cable systems according to DIN 4102-12, depending on the used configuration of the special cable supporting structure and cable.

Annex 3 contains connection drawings for BAKS trays, cable racks, channel sections and mesh trays and their fixing method to support structures.

[1]In accordance with the Regulation of the Minister of Infrastructure on technical conditions to be met by buildings and their location of 12 April 2002 (Dz. U. No. 75, item 690), as amended, in particular with amendments to the Regulation of 12 March 2009 (Dz. U. No. 56, item 461), which entered into force on 08.07.2009.

Table 1

TRAY SYSTEM		
No.	**Product name**	**Symbol**
1	Cable tray	KGL/KCL 50H60 KCL/KCOL100 - 300H60 KCJ/KCOJ100 - 400H60 KGL/KGOL100 - 300H60 KGJ/KGOJ100 - 400H60 KFL50H60 KFL100 – 300H60 KFJ100 - 400H60 KBL50 – 300H60 KBJ100 - 400H60 KCD/KCOD100 - 400H60 KCP/KCOP100 - 600H60
2	Tray connector	LPP/LPOPH60N LPLPH60 LKJ/LKOJH60 LKFJH60
3	Articulated tray connector	LGJH60, LGP/LGOPH60N LGFJH60
4	Connection plate	BL/BLO100 - 600N
5	End plate	BZK/BZKO100 - 600N
	System fittings for trays, such as: elbows, reduction elbows, tees, reduction tees, four-way pieces, reductions, bend elements, bends, bypasses, split connectors, etc. (fitting plate thickness not less than tray plate thickness)	KK… KR… TK… TR… CZK… RK… EL… , LL… , LU… OP… LR… etc.
7	Covers for trays and fittings (cover plate thickness not less than tray plate thickness)	PK… , PZK… PKK… , PZKK… PTK… , PZTK... PCZK… , PZCZK… PRK… , PTR..., PKR… etc.
8	Cover fastening	ZPN.. , ZPD.. , ZAP..
9	Cover latches	ZAMK…
10	Partitions for trays and fittings (partitions fixing with mushroom head screws + serrated face nut SGKM6x... max every 600 mm)	PG… PL… PGK…
11	Partition connector	LPG, LPKD
MESH TRAY SYSTEM		
12	Mesh tray	KDS/KDSO60 - 600H60 KDSZ60 – 400H60 KGS60 – 100H60 KSG60 – 600H60
13	Mesh tray connector	USSP USSN/USSO USSPW/USSPWO USSW USKS LKSUC, PKKS, PSKS, PDKS
14	Mesh tray fittings: - made by cutting rods and bolting with brackets - by using system fittings: elbows, tees	- number of cut-outs: 2-12, USSN/USSO, USSPW/USSPWO, ZS/ZSO, PLC.. - KKS… TKS… etc.
15	Partitions for mesh trays (partitions fixing with ZS/ZSO clamping pieces max every 600 mm)	PG…
16	Partition connector	LPG, LPD

RACK SYSTEM		
17	Cable rack	DGOD100 - 400H60N DGOP100 - 600H60N DUD100 - 400H60N DUP/DUOP100 - 600H60N DFP100 – 400H60 DSH100-400H80
18	Rack connector	LDC/LDOCH60N LKDC/LKDOCH60 LKUC2, LDDK..
19	Articulated rack connector	LGC/LGOCH60N, LDDCH60N
20	Rack fittings, such as: bend, vertical bend, articulated bend, tee, four-way piece, reduction, drop-out plate, etc.	LD… LPD… TD... CZ… RD… ZDK… etc.
21	Covers for racks and fittings (cover plate thickness not less than rack plate thickness)	PDD… , PZDD… PLD… , PZLD… PTD… , PZTD… PCZD… , PZCZD… PRD… , PZRD… PLPD… , PZLPD… etc.
22	Cover fastening	ZAP…
23	Partitions for racks (partitions fixing with SRM6x15 screws every 600 mm)	PG, PGD…
24	Partition connector	LPG, LPD
WALL TRUNKING SYSTEM		
25	Wall trunking	KS115-170H68
26	Wall trunking connector	LKS
27	Wall trunking fittings: elbows, tees, caps, plugs	KWKS… KZKS… KPKS… TSKS… NM… ZK… etc.
28	Wall trunking cover	PKS
29	Cover spring bracket	SU
ACCESSORIES		
30	Extension bracket	WMC/WMCO 100 – 600 WWS/WWSO 100 – 400 WWCT/WWCTO 100 – 400 WU/WUO 100 – 400 WPT/WPTO 100 WPTKO 100 – 400 WWCH 100 – 600
31	Hanger	WC50, WKS/WKSO60
32	Bracket	WFL/WFLO100 - 600 WFC/WFCO100 - 400
33	Triangular bracket	UTM/UTMO, UT
34	Mesh tray bracket	USK
35	Ceiling bracket	WPCW/WPCO… WPCE/WPCEO… WPCB…
36	Fastening clamp	ZM/ZMO
37	Screw clamp	ZS/ZSO
38	Clamp	ZSW
39	Reinforced channel, I-beam	CWP40H22/… CWP/CWOP40H40/…, CMP41H21/…, CMP41H41/…
40	Channel connector	LC…
41	Mounting profile	PMC/PMCO… PMCN…
42	I-beam	DPH…
43	I-beam fastening clamp	NKH

44	I-beam bracket adapter	OD
45	Bracket	UPW/UPWO UPWK/UPWKO
46	Cable clamp	UK1/UKO1… UK2/UKO2… UKZ1/UKZO1…
47	Cable tie	OPK
48	Rung	SDP/SDOP… SDC/SDOC…
49	Ceiling bracket	USV/USOV US12/USO12
50	Articulated rod hanger	WPPG,WPPGV/WPPOV
51	Angle rod hanger	WKPO
52	Cable clip	UDF… , UDFB… UEF… , UEFB…
53	Cable clamp	KSA…
54	Snap clamp	OZ/OZO OZS/OZSO OZM/OZMO
55	Thin-walled tubes	RU…
56	Clamp	ZK…, ZC…, ZSU3, ZSK1
57	Hold down clamp	UDC
58	Trapeze hanger	WT/WTO…
59	Pipe clamp	OBR…, OBS…, OBRK…
60	Tilting head plate	PSUN/PSUNO
61	Protection trough	RO1…
62	Pressure pin	KM6X15
63	Spacer washer	PD11
64	Expansion plate	BR…
	JUNCTION BOXES	
65	Box	PMO1/… , PMO1/…E PMO2/… , PMO2/…E PMO2B/…, PMO2B/…E PMO3/… , PMO3/…E PMO3B/… , PMO3B/…E PMO4BE
66	Box brackets	UP… UPU UPP… UPPO…
	SCREWED ELEMENTS	
67	Bolts/anchors/pins/screws*	SRO… (HK M6/4; KDM) SRBO… (HK M6/0) PSRO…(FBN II; R-HPTIIZF; MTP AP) PSRZ… (FAZ II) GSO…(FDN; DBZ 6/4,5; T-DN) KWBO…(FNA II) SBO…(FBS; HUS-P) SBSO…(FBS) KKG…(HM) MKR…(FMD) SKT… (SFI; SDU) KRN… KSKO…(FHY) KSSKO… WDB…
68	Expansion sleeves*	TRSO… (HKD; EA II; EM; DM-PRO) TRSK… (HKD; EA II)
69	Self-drilling screws*	SMD… (S-MD03PZ)
70	Anchor bolt*	SKT…
71	Cartridge nails*	GWT… (R-KNC), GWTS…
72	Chemical anchors*: Threaded rod, glass ampoule, injection mortar	PGS… (FTR) AS (FEB RM) ZIO300 (FIS VT 300 T)
73	Bolts	SGN… SGF… SGK… SGKF… SM…

		SRM...
74	Nuts	NS... NR...
75	Washers	PP... PW... PZZ...
76	Connection nuts	NL...
77	Threaded rods	PG...

* – trade name used by BAKS

Table 2

No.	Manufacturer	Cable types
1.	**Zakłady Kablowe BITNER Celina Bitner ul. Friedleina 3/3 30-009 Krakow Poland**	NHXH FE180/E30 MICA, NHXH FE180/E90 MICA, NHXCH FE180/E30 MICA, NHXCH FE180/E90 MICA, (N)HXH FE180/E30 CERAMIC, (N)HXH FE180/E90 CERAMIC, (N)HXCH FE180/E30 CERAMIC, (N)HXCH FE180/E90 CERAMIC JE-H(St)H E90 MICA, JE-H(St)H E90 CERAMIC JE-H(St)HRH E90 MICA, JE-H(St)HRH E90 CERAMIC HDGs, HDGSekw, HDGsekwf, HTKSH, HTKSHekw, HTKSHekwf, HLGs, HLGsekw, HLGs(żo), HLGsekwf(żo) BITflame S, BITflame S(St), BITfkame AS, BITflame AS(St), BITflame 1000, BITflame 1000C, BITservo FS, BITservo FS mika, Securi Flame F, PGI-H
2.	**DÄTWYLER Kabel+Systeme GmbH Lilienthalstrasse 17 DE-85399 Hallbergmoos Germany**	NHXH FE180/E90, (N)HXH FE180/E90, (N)HXH FE180/E30, (N)HXCH FE180/E90, (N)HXCH FE180/E30–E60 JE-H(St)H FE 180/E30-E90, JE-H(St)HRH FE 180 E30-E90
3.	**ELKOND HHK a.s. Oravicka 1228 028 01 Trstena Slovakia**	N2XH FE180/P30, N2XH FE180/P60, NHXH FE180/P90, JE-H(St)H FE180/P30, JE-H(St)H FE180/P90 1-CXKH-V, SHXKFH-V180
4.	**Kabelwerk EUPEN AG Malmedyer Str. 9 B-4700 Eupen Belgium**	NHXH-J FE 180/E90, NHXCH-J FE 180/E90, NHXCH FE 180/E90, (N)HXH FE 180/E90, (N)HXCH FE 180/E90 JE-H(St)H FE 180/E90,
5.	**Nexans Deutschland Industries GmbH Kabelkamp 20 30179 Hannover Germany**	N2XH E90, N2XH E30, N2XCH E90, N2XCH E90
6.	**FACAB Lynen Dürener Str. 340 D-52249 Eschweiler Germany**	NHXH FE 180/E90, NHXCH FE 180/E90, JE-H(St)H FE 180/E90, JE-H(St)HRH FE 180/E90
7.	**PRAKAB PRAŽSKÁ KABELOVNA a.s. Ke Bablu 278 102 09 Praha 15 Czech Republic**	(N)HXH, PRA FlaDur 1-CSKH-V180-0 P30-R, PH120-R B2ca s1d0, PRA FlaDur 1-CSKH-V180-0 P30-R
8.	**LEONI Studer AG Herrenmattstrasse 20 CH-4658 Däniken Switzerland**	BETAFLAM (N)HXCH FE 180/E90, BETAFLAM (N)HXCH FE 180/E30 – E60, BETAFLAM (N)HXH-J FE 180/E30-E60, JE-H(St)H…Bd FE 180/E30 – E90, JE-H(St)HRH…Bd FE 180/E30 - E90,
9.	**TECHNOKABEL S.A. Nasielska 55 04-343 Warsaw Poland**	NHXH FE180 PH90/E90 , (N)HXH FE180 PH30/E30-E60, (N)HXH FE180 PH90/E90, NHXCH FE180 PH90/E90, (N)HXCH FE180 PH30/E30-E60, (N)HXCH FE180 PH90/E90, (N)HXCH-J-SERVO FE180 PH90/E90, NHXHRHX FE180 PH90/E90 JE-H(St)H FE 180 PH90/E30-E90, HTKSH PH90/E30-E90, HTKSHekw PH90/E30-E90, HTKGs E30 HDGs FE180 PH90/E30-E90 300/500V, HDGsekw FE180 PH90/E30-E90 300/500V, HDGs-W FE180 PH90/E30-E90 300/500V, HDGszo-W FE180 PH90/E30-E90 300/500V,

		HLGs FE180 PH90/E30-E90 300/500V, HLGsekw FE180 PH90/E30-E90 300/500V, HLGsekw żo FE180 PH90/E30-E90 300/500V
10.	**TELE-FONIKA KABLE Sp. z o. o. S.K.A. ul. Wielicka 114 30-663 Krakow Poland**	NHXH FE 180/E90, (N)HXH-J FE 180/E90, (N)HXCH FE 180/E90 Flame-X 950 JE-H(St)H Bd FE180/E90 HTKSH E90 HDGs E90, HLGsekw E90,
11.	**Fabryka Kabli MADEX s.j. Stefanówka ul. Żurawia 96 05-462 Wiązowna Poland**	NHXH FE180 PH90/E90, NHXCH FE180 PH90/E90, HTKSH PH90, HTKSHekw PH90
12.	**KABLOTEK KABLO Alipasa mevkii Sanayi 12 Sokak No:7 Silivri-Istanbul Turkey**	NHXH-O FE180/E90, NHXCH-O FE180/E90, (N)HXH-O FE180/E30 JE-H(St)H FE180/E90, JE-H(St)H FE190/E30 LINCH FE180/E90
13.	**Fabryka Kabli ELPAR Sp. z o.o. Ul. Laskowska 1 21-200 Parczew Poland**	NHXH E90, NHXCH E90, (N)HXH E90, (N)HXCH E90 HDGs E90 PH90, HTKSH FE180/PH90
14.	**NKT Cables Group, Düsseldorfer Strasse 400, Chempark D-51061 Cologne Germany**	NHXH E30, NHXH E90

1.1.1 Name and address of the manufacturing site

BAKS cable support structures are manufactured in the production plant:

- BAKS Wytwarzanie Osprzętu Instalacyjno-Elektrotechnicznego, Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew

Cables and conductors are manufactured in the production plants:

- Zakłady Kablowe BITNER Celina Bitner, 32-353 Trzyciąż n/Krakow
- DÄTWYLER Kabel+Systeme GmbH, Lilienthalstrasse 17, DE-85399 Hallbergmoos,
- ELKOND HHK a.s., Oravicka 1228, 028 01 Trstena
- Kabelwerk EUPEN AG, Malmedyer Str. 9, B-4700 Eupen
- Nexans Deutschland Industries GmbH, Kabelkamp 20, 30179 Hannover
- FACAB Lynen, Dürener Str. 340, D-52249 Eschweiler
- PRAKAB PRAŽSKÁ KABELOVNA, a.s. Ke Bablu 278, 102 09 Praha 15
- STUDER Draht- und Kabelwerk AG, CH-4658 Däniken
- Fabryka Kabli TECHNOKABEL w Szreńsku, ul. Wiatraczna 28, 06-550 Szreńsk n/Mława
- TELE-FONIKA KABLE Sp. z o. o. S.K.A., ul. Wielicka 114, 30- 663 Krakow
- Fabryka Kabli MADEX Stefanówka ul. Żurawia 96, 05-462 Wiązowna
- KABLOTEK KABLO Alipasa mevkii Sanayi 12, Sokak No:7 Silivri – Istanbul
- Fabryka Kabli ELPAR Sp. z o.o. ul. Laskowska 1, 21-200 Parczew
- NKT cables s.r.o., Průmyslová 1130, 272 01 Kladno; NKT cables a/s, Toftegårdsvej 25, DK-4550 Asnaæs; NKT cables Vrchlabi s.r.o., Člen skupiny NKT, Českých bratří 509, 543 14 Vrchlabi,

1.2 Classification

The cable support structures included in BAKS cable systems are made of materials depending on the method of protection against corrosive atmosphere. In the E-30, E-90 systems, the products are available in four material versions:

- sheet metal and wire galvanised according to PN-EN ISO 2081;
- sheet metal galvanised according to the Sendzimir method, PN-EN 10327;
- sheet metal galvanised according to the immersion method, PN-EN 1461;
- acid-resistant sheet metal and wire in grades 1.4... (designation according to European standard PN-EN 10088).
- sheet metal galvanised according to the zinc flake method, PN-EN ISO 10683:2014-09

The above material versions can be additionally powder coated with polyurethane and epoxy paints or painted with acrylic paints.

There are the following types and designations of cables included in a BAKS cable system, as shown in Table 3.

Table 3

Designation	Cable name
HTKSH	Telecommunications (T) station (S) cable (K), unshielded with single wire copper conductors and halogen-free flame retardant low smoking insulation (H) as well as halogen-free flame retardant low smoking sheathing (H)
HTKSHekw	Telecommunications (T) station (S) cable (K), shielded (ekw) with single wire copper conductors and halogen-free flame retardant low smoking insulation (H) as well as halogen-free flame retardant low smoking sheathing (H)
NHXH	Power cable (N) with copper conductors and double insulation made of mica strip and cross-linked halogen-free flame retardant, low smoking (HX) material as well as halogen-free flame retardant low smoking (H) filling and sheathing
NHXCH	Power cable (N) with copper conductors and double insulation made of mica strip and cross-linked halogen-free flame retardant, low smoking (HX) material as well as halogen-free flame retardant low smoking (H) filling and sheathing, with coaxial conductor in the form of a spiral-shaped wrapping on the filling (C)
(N)HXH	Power cable (N) with copper conductors and cross-linked flame retardant low smoking (HX) silicone rubber insulation; filler and outer sheath made of halogen-free flame retardant low smoking (H) material
(N)HXCH	Power cable (N) with copper conductors and cross-linked flame retardant low smoking (HX) silicone rubber insulation; filler and outer sheath made of halogen-free flame retardant low smoking (H) material. Cable with additional coaxial conductor in the form of a spiral-shaped wrapping on the filling (C)
JE-H(St)H	Telecommunications installation cable (JE), insulation and sheath made of halogen-free, flame retardant, low smoking (H) material, with a shared screen in the centre (St)
N2XH	Power cable (N) with copper conductors and cross-linked polyethylene (2X) core insulation, halogen-free flame retardant low smoking (H) filling and sheath
N2XCH	Power cable (N) with copper conductors and cross-linked polyethylene (2X) core insulation, halogen-free flame retardant low smoking (H) filling and sheath, with coaxial conductor in the form of a spiral-shaped wrapping on the filling (C)
HDGs	Cable with single-wire copper conductors (D) with special silicone rubber insulation (Gs) and halogen-free flame retardant low smoking (H) sheath
HDGsekw	Cable with single-wire copper conductors (D) with special silicone rubber insulation (Gs) and halogen-free flame retardant low smoking (H) sheath as well as a shared screen in the centre (ekw)
HLGs	Cable with multi-wire copper conductors (D) with special silicone rubber insulation (Gs) and halogen-free flame retardant low smoking (H) sheath

Designation	Cable name
HLGsekw	Cable with multi-wire copper conductors (D) with special silicone rubber insulation (Gs) and halogen-free flame retardant low smoking (H) sheath as well as a shared screen in the centre (ekw)
PH 30 **PH 90**	Cable ability to maintain circuit integrity (actual current conductivity or signal transmission) according to PN-B-02851-1 expressed in minutes (test according to EN 50200)
E 30 **E 60** **E 90**	The ability of a cable together with a specified cable supporting structure (cable system) to maintain circuit integrity in minutes (test according to DIN 4102-12)
FE 180	Cable ability to maintain circuit integrity (actual current conductivity or signal transmission) expressed in minutes (test according to PN-IEC 60331-21 in static conditions at 750°C)

1.3. Marking

BAKS cable support structures are identified on the basis of the BAKS product catalogue. It is impossible to apply the product symbol on the elements due to the production technology; the products are mechanically marked only with the company logo or/and the product identification sticker.

Product marking appears on the component or on the packaging and provides the following information:

1. Name and address of the manufacturer.
2. Product symbol.
3. Product article number.
4. Packaging quantity.

Cable marking contains the following information:

- Cable symbol with the designation: (number of pairs) x (number of conductors in a pair) x (diameter of conductor),
- Trademark,
- Year of production.

2 INTENDED USE OF THE PRODUCT

2.1 Purpose

BAKS cable supporting structures together with power and telecommunication cables produced by the manufacturers listed in Table 2 of this National Technical Assessment can be used as cable systems in power supply and control systems for fire protection devices.

BAKS fire protection junction boxes for cable systems can be used to connect and branch power and telecommunication cables with fire resistance rating of E30-E90 according to DIN 4102-12:1998, designed for the transmission of signals and power supply of the fire protection equipment of the building.

The cable systems described in this national technical assessment are classified as E30, E60, E90 circuit integrity maintenance class according to DIN 4102-12, and according to § 187.3. of the Regulation of the Minister of Infrastructure of 12 April 2002 on the technical conditions to be met by buildings and their location (Dz. U. No. 75, item 690, as amended), as ensuring continuity of electricity supply or signal transmission for the time required to start and operate the device, determined respectively at 30, 60 and 90 minutes.

The assessment of cable systems in the scope of maintaining circuit integrity (continuity of electrical power supply or signal transmission), taking into account the type of substrate and expected fixing

method has been carried out in accordance with the conditions specified in the Polish Standard for fire resistance testing PN-EN 1363-1 - Fire resistance tests - Part 1. General requirements and DIN 4102-12 Fire performance of construction materials and components – Part 12: Maintenance of the circuit integrity of cable systems – Requirements and tests.

2.2 Usage scope and conditions, restrictions

Conductors and cables may be used in cable systems provided that:

- they meet the requirements of this national technical assessment, which should be verified by positive results of tests of the cable system (cable with fixing) according to the PN-EN 1363-1 and DIN 4102-12 standards, and
- cable manufacturers or suppliers performed conformity assessment of the product's performance, which resulted in the issuance of a certificate of conformity with the technical approval of the cable or a national certificate of constancy of performance in conformity with the national technical assessment of the cable

Anchors/bolts/screws/nails of verified fire resistance can be used in cable systems. The verification must be appropriately documented, depending on the assessment system (for system 1, a certificate of conformity or certificate of constancy of performance, for system 2+, an European technical approval or European technical assessment or national technical approval or national technical assessment).

Annex 1 contains the drawings of standard BAKS cable support structures and classifications of cable systems according to DIN 4102-12, depending on the used configuration of the standard cable supporting structure and cable.

Annex 2 contains the drawings of special BAKS cable support structures and classifications of cable systems according to DIN 4102-12, depending on the used configuration of the special cable supporting structure and cable.

Annex 3 contains connection drawings for BAKS trays, cable racks, channel sections and mesh trays and their fixing method to support structures.

2.3 Installation

BAKS cable systems must be fixed to a concrete substrate of class ≥ C25 or natural stone. It is permitted to mount the cable systems to other substrates of adequate strength confirmed by the certificate of load bearing capacity equal at least to the resistance of the cable systems.

Basic parameters for fixing trays are presented in Table 6

Basic parameters for fixing racks are presented in Table 7

Basic parameters for other fixing elements are presented in Table 8

Basic parameters for fixing wire mesh trays are presented in Table 9

Basic parameters for the application of junction boxes are presented in Table 10

The following boundary conditions must be observed:

- Brackets and extension brackets should be fixed to a solid ceiling or wall using steel bolts selected to fit the substrate in accordance with the manufacturer's instructions.
- M8, M10, M12 wall anchors and sleeves should be recessed in concrete at least 60 mm and M6 – at least 30 mm. The tension force per anchor should not exceed 500 N. Alternatively, anchors with verified fire safety specifications may be used. The installation instructions of the manufacturer of the approved anchors must be followed at all times,
- When mounting the cable system to a concrete floor, a channel section must be used as an intermediate element between the channel and the floor. The channel must be firmly fixed to the ground and additionally twisted with the cable route. Distance between channels according to tables 6 – 9.

- When laying cables or conductors with fire resistance rating E30 - E90 outside the building (outside a separated fire zone), it is necessary to use a weather-resistant cable routes that protect the cable installation against UV radiation. Cable segregation is to be maintained and the attachment to the ground is to ensure stability of the route.
- Tightening torques for bolts, nuts and other screwed elements should be in accordance with Table 4. Alternatively, screwed elements with a tightening torque different from that specified in Table 4 may be used but their fire safety performance must be documented. Support structures using PGM threaded rods... should be made taking into account the permissible strength of the rods (Table 4); for E90 (6N/mm^2) or E30-E60 (9N/mm^2) constructions

Table 4

TORQUES		PERMISSIBLE LOAD FOR PGM THREADED RODS			
d	T_{nom} [Nm]	Rod cross-section [mm^2]	E30	E60	E90
			Permissible PGM rod load [kg]		
M6	7.2	20.1	18	18	12
M8	17.4	36.6	33	33	22
M10	33.9	58	52	52	35
M12	58.2	84.3	76	76	50

- BAKS fire protection junction boxes can be used with cables or conductors manufactured by BITNER, EUPEN, KABLOTEK KABLO, MADEX, PRAKAB, STUDER, TECHNOKABEL, TELE-FONIKA KABLE as specified in Annex 2 Table 23.
- BAKS fire protection junction boxes may also be used with certified HTKSH FE180/PH90/E90, JE-H(St)H FE180/E90, HDGs FE180/E90, NHXH FE180/E90, NHXCH FE180/E90, (N)HXH FE180/E90, (N)HXCH FE180/E90 cables from other manufacturers, provided that these cables are of the E90 class for direct mounting to the ceiling on single brackets with 300 mm spacing (Annex 1 - structure B).
- Outside the fire protection junction boxes, the cable systems should be laid in accordance with the provisions of the Technical Approvals and National Technical Assessments issued by CNBOP-PIB for cable systems.
- It must be ensured that BAKS cable systems are not impaired in their circuit integrity maintenance class by falling construction elements.

BAKS cable systems can be made as suspended structures – fixed to ceilings and slab roofs, wall mounted horizontally, vertically or diagonally. Fastening to steel structures and trapezoidal sheets is also permitted.

Permitted for BAKS cable systems:

- fastening to another substrate of at least the same fire resistance class (fire resistance R30, R60, R90) as the cable system using certified anchors suitable for the substrate and load
- laying the cables in layers in a tray or rack while maintaining the permissible load for the E30-E90 cable route,
- fixing cables with metal brackets in halogen-free plastic strips and pipes,
- laying routes up to 400mm wide on horizontal CWP/CWOP40H40 or CMP41H41 channels with the maximum length of 2000 mm,
- laying routes up to 400mm wide on horizontal CWP40H22 or CMP41H21 channels with the maximum length of 500 mm,
- fixing PMO junction boxes by BAKS directly to the sides of racks, trays and channels or by means of system brackets (can be used with cables listed in Table 5 (fixing method no. 21 – 23),

- fixing fire protection system components not exceeding 3.5 kg (e.g. emergency lighting fittings) to the base of the CWP/CWOP40H40 or CMP41H41 channel below the maximum load for the structure
- fixing threaded rods directly to the ceiling by means of appropriate, certified anchoring elements, by means of USV/USOV ceiling brackets or by means of WPPG, WPPGV/WPPOV articulated rod brackets.
- use of halogen-free plastic cable ties to separate cables/conductors on trays, racks and wire mesh trays
- using, in place of a single tray or rack with the maximum width as shown in Annexes 1 and 2, two trays or racks, the total width of which should be equal to the maximum width as shown in the figures, while maintaining other structural parameters as shown in the figure (e.g. total load of both trays or racks must be less than or equal to the loads shown in the figure),
- connecting threaded rods together in order to extend them with connecting nuts NLM6, NLM8, NLM10, locked with at least one NSM nut
- making additional holes in KB-type solid trays in order to fix them to the support structure, connect them to other trays or fittings, attach a PMO junction box,
- use of NO protective caps to protect the sharp edges of channels, racks, brackets and extension brackets,
- angled route laying (elevation change) using a support structure as shown in the following figure

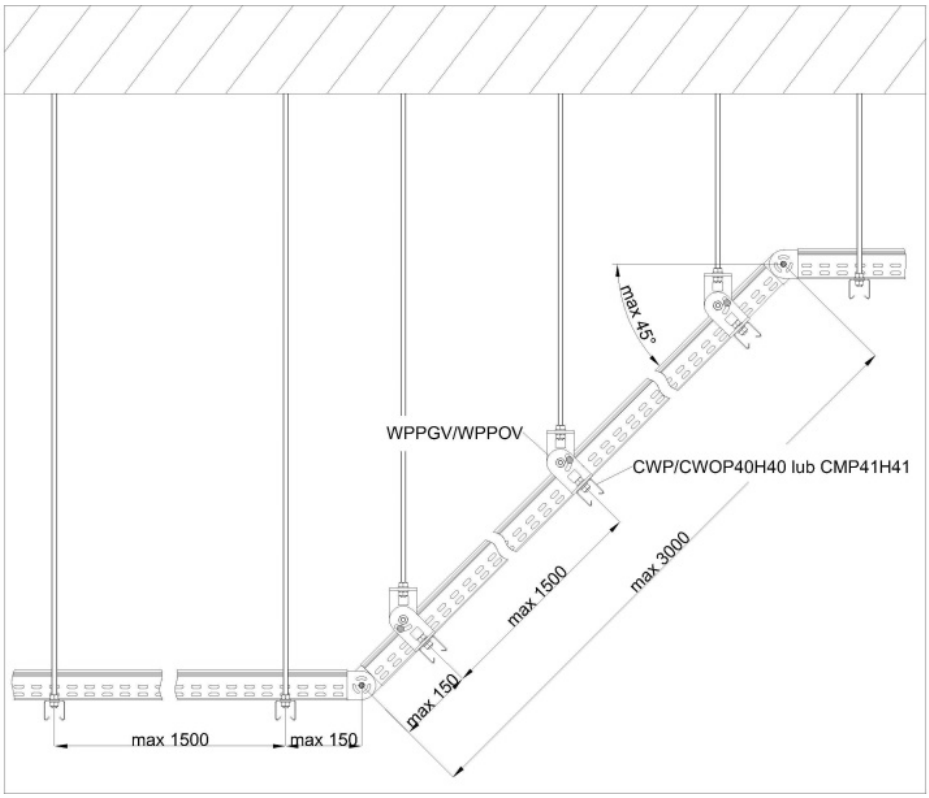

Figure 4: Angled route laying

- For special BAKS cable systems, it is permitted to use alternately trays/racks made of thicker sheet metal, according to Table 5.

Table 5

Tray/rack type	Sheet thickness [mm]	Tray/rack type	Sheet thickness [mm]	Tray/rack type	Sheet thickness [mm]	Tray/rack type	Sheet thickness [mm]
KGL/KCL50H60	0.7	KGJ/KCJ50H60	1.0				
KGL/KGOL100H60	0.7	KGJ/KGOJ100H60	1.0				
KGL/KGOL150H60	0.7	KGJ/KGOJ150H60	1.0				
KGL/KGOL200H60	0.7	KGJ/KGOJ200H60	1.0				
KGL/KGOL300H60	0.7	KGJ/KGOJ300H60	1.0				
KGL/KCL50H60	0.7	KCJ/KCOJ50H60	1.0	KCD50H60	1.2	KCP50H60	1.5
KCL/KCOL100H60	0.7	KCJ/KCOJ100H60	1.0	KCD100H60	1.2	KCP/KCOP100H60	1.5
KCL/KCOL150H60	0.7	KCJ/KCOJ150H60	1.0	KCD150H60	1.2	KCP/KCOP150H60	1.5
KCL/KCOL200H60	0.7	KCJ/KCOJ200H60	1.0	KCD200H60	1.2	KCP/KCOP200H60	1.5
KCL/KCOL300H60	0.7	KCJ/KCOJ300H60	1.0	KCD300H60	1.2	KCP/KCOP300H60	1.5
		KCJ/KCOJ400H60	1.0	KCD400H60	1.2	KCP/KCOP400H60	1.5
KFL50H60	0.7	KFJ50H60	1.0				
KFL100H60	0.7	KFJ100H60	1.0				
KFL150H60	0.7	KFJ150H60	1.0				
KFL200H60	0.7	KFJ200H60	1.0				
KFL300H60	0.7	KFJ300H60	1.0				
KBL50H60	0.7	KBJ50H60	1.0	KBD50H60	1.2	KBP50H60	1.5
KBL100H60	0.7	KBJ100H60	1.0	KBD100H60	1.2	KBP100H60	1.5
KBL150H60	0.7	KBJ150H60	1.0	KBD150H60	1.2	KBP150H60	1.5
KBL200H60	0.7	KBJ200H60	1.0	KBD200H60	1.2	KBP200H60	1.5
KBL300H60	0.7	KBJ300H60	1.0	KBD300H60	1.2	KBP300H60	1.5
		KBJ400H60	1.0	KBD400H60	1.2	KBP400H60	1.5
DUD100H60	1.2	DUP/DUOP100H60	1.5				
DUD200H60	1.2	DUP/DUOP200H60	1.5				
DUD300H60	1.2	DUP/DUOP300H60	1.5				
DUD400H60	1.2	DUP/DUOP400H60	1.5				
DGOD100H60	1.2	DGOP100H60	1.5				
DGOD200H60	1.2	DGOP200H60	1.5				
DGOD300H60	1.2	DGOP300H60	1.5				
DGOD400H60	1.2	DGOP400H60	1.5				

It is prohibited to:

- Use of a shared support structure for a route constituting an E90 cable system and a route without fire resistance functionalities,
- Lay ordinary/non-fire-resistant cables in the cable systems described in this National Technical Assessment,
- Configure routes using elements from Table 1 but not included in Annexes 1 and 2,
- Modify the shape of elements for making fittings (not applicable to wire mesh channels). Fittings for perforated and solid trays and cable racks must be made using the provided system elements. Changing route level (elevation change) should be carried out with the use of hinged connectors. Tray edges should be protected with end plates or protective tape,

The **permissible loads and technical parameters** of BAKS cable support structures should be in accordance with the BAKS catalogue and Tables 6-10.

Table 6

BASIC TRAY FIXING PARAMETERS		
	Symbol	**Sheet th.**
Tray types	KGL/KCL50H60 *	0.7 mm
	KCL/KCOL100 -300H60 *	0.7 mm
	KGL/KGOL100 - 300H60 *	0.7 mm
	KFL50H60 *	0.7 mm
	KFL100-300H60 *	0.7 mm
	KBL100-300H60 *	0.7 mm

	KCJ/KCOJ100 - 400H60 * KGJ/KGOJ100 - 400H60 * KFJ100-400H60 * KBJ100-400H60 * KCD/KCOD100 - 400H60 * KCP/KCOP100 - 600H60	1.0 mm 1.0 mm 1.0 mm 1.0 mm 1.2 mm 1.5 mm
Permitted tray perforation	15 ± 5% Not applicable to KB trays	
CONNECTING TRAYS		
Up to (including) 1,2 mm sheet thickness by means of insertion and screwing with M6 bolts (Annex 3)		
Up to (including) 1,2 mm sheet thickness by means of connectors, connecting plates and M6 bolts (Annex 3)		
Connector type	LPP/LPOPH60N, LPLPH60	
Type of connecting plate depending on the width of the tray	BL/BLO100 -600N	
Connecting bolt type	Bolts: SGNM6x12 or SGKM6x12 in cl.5.8	
TRAY FIXING DESIGN		
Max. tray load	5kg/mb *, 10kg/mb, 20kg/mb *. 25kg/mb *	
Max. support spacing	1.2 m; 1.5 m*; 1.7m*	
Method of fixing to the support structure	Fixing as shown in the drawings in Annex 3	
Max. number of route levels per structure	3 levels, 4 levels (for structure no 25 according to Annex 2)	
Max. tray width or sum of tray widths	600 mm *	
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system	
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *	
Fixing to substrate: - Concrete, Cracked concrete - Stone, Solid brick - Duct brick[LD11], duct concrete - SILKA brick, Porotherm - Aerated concrete	Expansion bolts PSROM…, SRO…, SRBO…, PSRZ…, SKT…, Concrete bolts SBO…, SBSO… Anchor bolts MKR…, KRN… Expansion sleeve TRSO…, TRSK…, KSKO… Anchors KSSKO…, GSO…, KWBO… Chemical anchors PGS..., AS, ZI300 Threaded rods PGM...	
Fixing to steel structure	Self-drilling screw SMD... Clamp ZK… Threaded rod PGM... Hold down clamp UDC Channel CWP/CWOP… Clamp OBRK… (In accordance with Annex 2)	
Fixing to trapezoidal sheet	Self-drilling screw SMD... Trapeze hanger WT... Threaded rod PGM... PGM... rod hanger pin (In accordance with Annex 2)	
Fixing to elevated floor structure	Pipe clamp OBR... Reinforced channel CWP/CWOP40H40 or/and CMP41H41 (In accordance with Annex 2)	
Max. load for bolts, threaded rods, sleeves and anchor bolts in E30, E60 system	9 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results	
Max. load for bolts, threaded rods, sleeves and anchor bolts in E90 system	6 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results	

* – special constructions

Table 7

BASIC RACK FIXING PARAMETERS		
	Symbol	**Sheet th.**
Rack types	DGOD100 - 400H60 * DUD100 – 400H60 * DUP/DUOP100-600H60 * DGOP100 - 600H60	1.2 mm 1.2 mm 1.5 mm 1.5 mm
Max. rungs spacing	150 mm; 300 mm*	
CONNECTING RACKS		
With connectors, screwed with M8 bolts (Annex 3)		
Connector type	LDC/LDOCH60N	

Connecting bolt type	Bolts: SGNM8x14 or SGKM8x14 in cl.5.8 - 4 pcs. per LDC/LDOCH60N connector
HORIZONTAL RACKS FIXING	
Max. rack load	20 kg/m; 25 kg/m*; 30 kg/m*, 40 kg/m*
Max. support spacing	1.2 m; 1.5 m*; 1.7 m*
Fixing rack to support structure	ZM/ZMO clamp as shown in the drawings (Annex 3) - 1 pc. for width of 100 mm - 2 pcs. for width of 200 – 600 mm
Number of route levels per structure	3 levels, 4 levels (for structure no 25 according to Annex 2)
Max. rack width or sum of rack widths	600 mm*
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *
Fixing to substrate: - Concrete, Cracked concrete - Stone, Solid brick - Duct brick, duct concrete - SILKA brick, Porotherm - Aerated concrete	Expansion bolts PSROM..., SRO..., SRBO..., PSRZ..., SKT..., Concrete bolts SBO..., SBSO... Anchor bolts MKR..., KRN... Expansion sleeve TRSO..., TRSK..., KSKO... Anchors KSSKO..., GSO..., KWBO... Chemical anchors PGS..., AS, ZI300 Threaded rods PGM...
Fixing to steel structure	Self-drilling screw SMD... Clamp ZK... Threaded rod PGM... Hold down clamp UDC Channel CWP/CWOP... Clamp OBRK... (In accordance with Annex 2)
Fixing to trapezoidal sheet	Self-drilling screw SMD... Trapeze hanger WT... Threaded rod PGM... PGM... rod hanger pin (In accordance with Annex 2)
Fixing to elevated floor structure	Pipe clamp OBR... Reinforced channel CWP/CWOP40H40 or/and CMP41H41 (In accordance with Annex 2)
Max. load for bolts, threaded rods, sleeves and anchor bolts in E30, E60 system	9 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results
Max. load for bolts, threaded rods, sleeves and anchor bolts in E90 system	6 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results
VERTICAL RACKS FIXING	
Bracket type	UTM/UTMO, UT,
Max. rack load	20 kg/m;
Max. bracket spacing	1.2 m; 1.5 m*
Fixing rack to bracket	Bolts: SGNM8x14 or SGKM8x14 in cl.5.8
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *
Fixing to substrate: - Concrete, Cracked concrete - Stone, Solid brick - Duct brick, duct concrete - SILKA brick, Porotherm - Aerated concrete - Plasterboard structure	Expansion bolts PSROM..., SRO..., SRBO..., PSRZ..., SKT..., Concrete bolts SBO..., SBSO... Anchor bolts MKR..., KRN... Expansion sleeve TRSO..., TRSK..., KSKO... Anchors KSSKO..., GSO..., KWBO... Chemical anchors PGS..., AS, ZI300 Threaded rods PGM...
Fixing to steel structure*	Threaded rod PGM... Hold down clamp UDC Triangular bracket UTM/UTMO or UTM Channel CWP/CWOP... or CMP41H41... (In accordance with Annex 2)
Fixing cables on rack	Fix the cables max. every 300mm or every 600mm* using brackets: UKO1...-max. number of cables in one bracket UKO1...-3 pcs. or 5 pcs. up to 20 mm diameter UKO2...-max. number of cables in one bracket UKO2...-3 pcs. or 5 pcs. up to 20 mm diameter

Max. load for bolts, threaded rods, sleeves and anchor bolts in E30, E60 system	9 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results
Max. load for bolts, threaded rods, sleeves and anchor bolts in E90 system	6 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results

* – special constructions

Table 8

BASIC MESH TRAY FIXING PARAMETERS*	
	Galvanised steel rod
Mesh tray types	KDS/KDSO60-600H60 KSG60-600H60 KDSZ100-400H60 KGS60-100H60
Wire diameter	Ø 4 – 5 mm
CONNECTING MESH TRAYS	
Connector type	Joint connector USS N/USSO Joint connector USSPW/SPWO Joint connector USSW/USSWO*
HORIZONTAL MESH TRAY FIXING	
Max. mesh tray load	20 kg/mb – KDS/KDSO100-600H60, KSG100-600H60, KDSZ100-400H60 2 kg/mb – KDS/KDSO60H60, KSG60H60 5 kg/mb – KGS60-100H60
Max. support spacing	1.5 m
Mesh tray fixing	- Clamp ZS/ZSO - Hanger WKS/WKSO60 - Clamp ZSW - Joint connector USSPW/SPWO - mounting profile PMC/PMCO - mesh tray bracket USK
Number of route levels per structure	3 levels, 4 levels (for structure no 25 according to Annex 2)
Max. mesh tray width or sum of mesh tray widths	600 mm
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *
Fixing to substrate: - Concrete, Cracked concrete - Stone, Solid brick - Duct brick, duct concrete - SILKA brick, Porotherm - Aerated concrete	Expansion bolts PSROM..., SRO..., SRBO..., PSRZ..., SKT..., Concrete bolts SBO..., SBSO... Anchor bolts MKR..., KRN... Expansion sleeve TRSO..., TRSK..., KSKO... Anchors KSSKO..., GSO..., KWBO... Chemical anchors PGS..., AS, ZI300 Threaded rods PGM...
Fixing to steel structure	Self-drilling screw SMD... Clamp ZK... Threaded rod PGM... Hold down clamp UDC Channel CWP/CWOP... (In accordance with Annex 2)
Fixing to trapezoidal sheet	Self-drilling screw SMD... Trapeze hanger WT... Threaded rod PGM... PGM... rod hanger pin (In accordance with Annex 2)
Fixing to elevated floor structure	Pipe clamp OBR... Reinforced channel CWP/CWOP40H40 or/and CMP41H41 (In accordance with Annex 2)
Max. load for bolts, threaded rods, sleeves and anchor bolts in E30, E60 system	9 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results
Max. load for bolts, threaded rods, sleeves and anchor bolts in E90 system	6 N/mm² of bolt (rod) cross-section – For standard solutions. For special solutions, loads according to test results

* – special constructions

Table 9

BASIC CABLE BRACKETS AND CLAMPS FIXING PARAMETERS CEILING OR WALL MOUNTING	
CABLE CLAMPS AND BRACKETS – VERTICAL AND HORIZONTAL CABLE/CONDUCTOR ROUTING	
Clamp/bracket types	UDF…, UDFB… UEF…, UEFB… KSA…
Cable diameters possible to install on brackets	Diameter: from Ø5mm to Ø42mm for: UDF…, UDFB…, UEF…, UEFB…; Diameter: from Ø5mm to Ø55mm for: KSA… max. number of cables per KSA clamp 3 pcs. with diameters from 20mm or 5 pcs. with diameters up to 20mm
Max. bracket spacing	300 mm, 600 mm*
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *
Fixing to substrate: - Concrete, stone, solid brick - Aerated concrete, Silicate - Plasterboard - Duct brick, duct concrete - SILKA brick, Porotherm	Anchor bolts SROM... Anchor bolts SRBOM... Expansion bolt PSROM... Sleeve TRSOM… + threaded rod PGM… Sleeve TRSK… + threaded rod PGM… Frame anchor KRN… Expansion anchor GSO... Nail anchor KWBO... Concrete bolts SBO…, SBSO… Concrete screw WDB... Anchor Bolt SKTO..., SKTZO... Metal anchor bolt MKR... Plasterboard anchor KKG... Anchor KSKO… , KSSKO….
Fixing to steel structure	Clamp ZK…, ZSU3 Self-drilling screw SMD... Cartridge nails GWT...
Fixing to sheet metal	Self-drilling screw SMD... Trapeze hanger WT... Threaded rod PGM... PGM... rod hanger pin
CABLE CLAMPS – HORIZONTAL CABLE/CONDUCTOR ROUTING	
Types of clamps	OZ/OZO OZS/OZSO OZM/OZMO
Max. load	OZ/OZO – 6kg/m OZS/OZSO – 2kg/m OZM/OZMO – 1kg/m
Max. clamp spacing	300 mm, 600 mm*
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *
Fixing to substrate: - Concrete, stone, solid brick - Aerated concrete, Silicate - Plasterboard - Duct brick, duct concrete - SILKA brick, Porotherm	Anchor bolts SROM... Anchor bolts SRBOM... Expansion bolt PSROM... Sleeve TRSOM… + threaded rod PGM… Sleeve TRSK… + threaded rod PGM… Frame anchor KRN… Expansion anchor GSO... Nail anchor KWBO... Concrete bolts SBO…, SBSO… Concrete screw WDB... Anchor Bolt SKTO..., SKTZO... Metal anchor bolt MKR... Plasterboard anchor KKG... Anchor KSKO… , KSSKO….
Fixing to steel structure	Clamp ZK… Self-drilling screw SMD... Cartridge nails GWT...

Fixing to sheet metal	Self-drilling screw SMD... Trapeze hanger WT... Threaded rod PGM... PGM... rod hanger pin
RACK RUNK FIXING	
Rung type	SDP/SDOP…, SDC/SDOC…
Rung lengths	Length from 100 mm to 1000 mm, according to BAKS catalogue (max. anchoring elements spacing 250 mm)
Max. rungs spacing	300 mm, 600 mm*
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *
Fixing cables on rung	Fix the cables max. every 300mm or every 600mm* using brackets: UKO1...-max. number of cables in one bracket UKO1...-3 pcs. or 5 pcs. up to 20 mm diameter UKO2...-max. number of cables in one bracket UKO2...-3 pcs. or 5 pcs. up to 20 mm diameter (permitted use of protection troughs RO1...)
Fixing to substrate: - Concrete, stone, solid brick - Aerated concrete, Silicate - Plasterboard - Duct brick, duct concrete - SILKA brick, Porotherm - steel structure elements	Anchor bolts SROM... Anchor bolts SRBOM... Expansion bolt PSROM... Frame anchor KRN… Expansion anchor GSO... Nail anchor KWBO... Concrete bolts SBO…, SBSO… Concrete screw WDB... Metal anchor bolt MKR... Plasterboard anchor KKG... Anchor KSKO… , KSSKO…. Self-drilling screw SMD...

* – special constructions

Table 10

BASIC PMO FIRE PROTECTION JUNCTION BOXES FIXING PARAMETERS	
Box types	**PMO1 5/6** - 5 ceramic blocks, 6 rubber/plastic twisted glands **PMO1 5/3** - 5 ceramic blocks, 3 rubber/plastic twisted glands **PMO1 3/3** - 3 ceramic blocks, 3 rubber/plastic twisted glands **PMO2 5/6** - 5 ceramic blocks, 6 rubber/plastic twisted glands **PMO2 5/3** - 5 ceramic blocks, 3 rubber/plastic twisted glands **PMO2 3/3** - 3 ceramic blocks, 3 rubber/plastic twisted glands **PMO3 6/4** - 6 ceramic blocks, 4 rubber/plastic twisted glands **PMO3B 6/4** - 6 ceramic blocks, 4 rubber/plastic twisted glands, fuse **PMO3 17/4** - 17 ceramic blocks, 4 rubber/plastic twisted glands PMO4BE - 2 ceramic blocks, 3 rubber/plastic twisted glands, fuse
Application	Pull boxes, junction boxes
Cross-sections and number of wires in one cube terminal	**PMO1**: 5 x 0.5 mm^2; 5 x 0.75 mm^2; 4 x 1 mm^2; 3 x 1.5 mm^2; 1 x 2.5 mm^2 + 1 x 1.5 mm^2; 1 x 4 mm^2; 1 x 6 mm^2; 1x 1.5 mm^2+ 1 x 2.5 mm^2 **PMO2**: 6 x 1 mm^2; 6 x 1.5 mm^2; 4 x 2.5 mm^2; 2 x 4 mm^2; 1 x 6 mm^2; 1 x 10 mm^2 **PMO3**: 1 x 16 mm^2 or for PMO3 17/4 box; 4 x 1 mm^2; 3 x 1.5 mm^2; 1 x 2.5 mm^2 + 1 x 1.5 mm^2; 1 x 4 mm^2; 1 x 6 mm^2; 1x 1.5 mm^2+ 1 x 2.5 mm^2 **PMO4**: 1x16
Colour	RAL 2003
Cable fixing	Max. 150 mm from the edge of the box; installation according to table 10
Cable routes location	The location of cable routes must be designed/installed in such a way as to exclude negative impacts from other building elements or equipment which could lead to damage to the cable system
Substrate type	Concrete class min. B20/C25 or other substrate with the required fire resistance *

Fixing to substrate: - Concrete, stone, solid brick - Aerated concrete, Silicate - Plasterboard - Duct brick, duct concrete - SILKA brick, Porotherm	Anchor bolts SROM... Anchor bolts SRBOM... Expansion bolt PSROM... Frame anchor KRN… Expansion anchor GSO... Nail anchor KWBO... Concrete bolt SBO… Metal anchor bolt MKR... Plasterboard anchor KKG... Anchor KSKO… , KSSKO…. Threaded rod PGM6 + washers + nuts
Fixing to steel structure	Self-drilling screw SMD... Bolt (set) SMM6…, SG…
Fixing to sheet metal	Self-drilling screw SMD...
Fixing to cable routes	Mushroom head screw SG... Bolt (set) SMM6x… Screw clamp ZS/ZSO USSPW/USSPWO Box bracket UP... Box bracket UPU... Box bracket UPP... Box bracket UPPO...

* – special constructions

3 PRODUCT PERFORMANCE CHARACTERISTICS AND METHODS APPLIED TO THEIR ASSESSMENT

3.1 Maintenance of the circuit integrity of cable systems

Table 11

No.	Properties	Requirements	Test methods
1.	Maintenance of the circuit integrity of cable systems (ensuring continuity of power supply or signal transmission for the time required for the starting and operation of the fire protection device)	Class E30, E60, E90 according to DIN 4102-12 30, 60 and 90 minutes according to Polish regulations	PN-EN 1363-1 and DIN 4102-12

4 PACKAGING, STORAGE, TRANSPORT AND THE METHOD OF MARKING THE PRODUCT

4.1 Packaging

BAKS cable support structures

The elements of BAKS cable support structures should be placed in unit or collective packaging protecting them against mechanical and environmental damage, and then transport packaging, limiting the possibility of free movement and protecting them against damage during handling and transport.

The following information should appear on the packaging:

— name of the manufacturer;

— product symbol;

— number of structural elements units in the package (for collective packaging).

Cables

Manufacturing sections of cables should be provided with tight ends.

Cables should be packaged in accordance with the requirements of the PN-E-79100 standard.

4.2 Storage

BAKS cable support structures

Store the components of BAKS support structures according to the following conditions:

1. Delivered state products (i.e. in original BAKS packaging) must be stored in dry and ventilated rooms.
2. During storage, protect against rapid changes in air humidity and temperature, which may cause condensation of water vapour. Failure to do so may result in white spots (zinc oxides).
3. If it is necessary to place the products in the open air for a short period of time, moisture drainage must be provided. Use a cover ensuring air circulation.
4. Should the products get wet, they must be dried (separate pieces, so that they do not come into contact with each other and placed in a dry, well-ventilated place until they are completely dry) before storage.

Cables

Cables should be packaged in accordance with the requirements of the PN-E-79100 standard.

4.3 Transport

BAKS cable support structures

The transport of BAKS support structure elements packed in accordance with point 4.1 may be carried out by any means of transport. The components of the support structure must be protected against mechanical damage and against relative humidity higher than 95 % at +40 °C in accordance with the requirements of the applicable transport regulations.

Cables

Cables should be transported in accordance with the requirements of PN-E-79100 standard.

4.4 Product marking method

BAKS cable support structures are identified on the basis of the BAKS product catalogue. Applying the product symbol on all elements is impossible due to the production technology, only selected products are mechanically marked with the product symbol or the company logo.

Product marking appears on the packaging and provides the following information:

1. Name of the manufacturer
2. Product symbol
3. Package quantity

Under the Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on the methods of declaring the performance of construction products and the method of marking them with a construction mark (Dz U. of 2016, item 1966):

§ 10. 1. The manufacturer shall mark the construction product with the construction mark before placing it in circulation or making it available on the national market.

2. The construction mark shall be affixed in a visible, readable and permanent manner either directly to the construction product or to a label affixed to that product.

3. Where it is not possible to affix the construction mark as specified in paragraph 2, due to the size or the nature of the construction product, that mark shall be affixed to the unit or collective packaging the or documents accompanying the construction product.

§ 11. 1. The marking of a construction product with a construction mark shall be accompanied by

the following information:

1) the last two digits of the year in which the construction mark was first affixed to the construction product;

2) the manufacturer's name and registered office or an identification mark enabling the manufacturer's name and registered office to be

clearly identified;

3) name and type designation of the construction product;

4) the number and year of issue of the national technical assessment according to which the performance was declared;

5) the number of the national declaration of performance;

6) the level or class of the declared performance;

7) the name of the certification body that participated in the assessment and verification of constancy of performance of the construction product;

8) the address of the manufacturer's website if the national declaration of performance is made available on it.

2. The information referred to in par. 1 shall be placed or attached to the construction product, applying the provisions of § 10 par. 2 and 3, respectively.

5 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

5.1 General principles

In accordance with Article 4, Article 5(2) and Article 8(1) of the Act of 16 April 2004 on construction products (Dz. U. No 92, item 881, as amended), a product to which this National Technical Assessment refers may be placed on the market and used in the performance of construction works to the extent corresponding to its functional properties and intended use, if the manufacturer has assessed and verified the constancy of performance and by issuing a national declaration of performance of the construction product has declared that, under his sole responsibility, the product performance complies with **the National Technical Assessment CNBOP–PIB Nr CNBOP-PIB-KOT-2018/0056-3703 Issue 1** and affixed the construction mark to the product.

In accordance with the Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on the methods of declaring the performance of construction products and the method of marking them with the construction mark (Dz. U. of 2016, item 1966), the assessment and verification of the constancy of performance of **BAKS cable systems (cable support structures with electric conductors and cables) with the circuit integrity maintenance class of E30, E60, E90 according to DIN 4102-12** is performed by the manufacturer using **system 1+ of assessment and verification of constancy of performance** meaning a certification of conformity of the product performance characteristics by an accredited certification body on the basis of:

1) the activities of the manufacturer, including the determination of the type of construction product and maintenance of:

a) factory production control system,

b) testing of samples collected at the factory by the manufacturer in accordance with a prescribed test plan;

2) the assessment and verification carried out by an accredited certification body shall include:

a) assessment of the performance of the construction product on the basis of testing of samples taken by the certification body, calculations, tabulated values or descriptive documentation of the product,

b) initial inspection of the manufacturing plant and factory production control,

c) issuance of a national certificate of constancy of performance,

d) continuous surveillance, assessment and evaluation of factory production control,

e) carrying out control tests on samples taken by the certification body at the manufacturing plant or in the manufacturer's storage facilities.

5.2 Factory production control (FPC)

5.2.1 General provisions

The manufacturer must establish, document and maintain a system of FPC to ensure that the products placed on the market conform to the prescribed performance.

The FPC system shall include written procedures, regular inspections and testing and/or assessment and the use of results to control raw materials and other incoming materials or components, equipment, the manufacturing process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic and orderly manner in the form of written policies and procedures. Such documentation of the production control system should ensure a common understanding of the conformity assessment and enable the required performance of the product to be achieved and should enable the effective operation of the production control system to be verified.

The factory production control simultaneously uses operating techniques and all the actions allowing to maintain and control the conformity of the product with this National Technical Assessment.

5.2.2 Requirements

The construction product subject to this National Technical Assessment should be manufactured according to the factory production control system.

The manufacturer must establish, document, implement and maintain a factory production control system in order to ensure the constancy of performance of the construction product as specified in this National Technical Assessment.

The documentation of the factory production control shall include:

a) organisational structure,

b) requirements for personnel (qualifications, authorisations, responsibility for particular elements of the factory production control, training),

c) management reviews performed by the management,

d) supervision of documentation and records,

e) plans for inspections and testing of raw materials, requirements,

f) plans for inspections and testing of the finished product,

g) supervision over the equipment used for production,

h) supervision over equipment used for the inspections and testing with the maintenance of measurement coherence,

i) supervision over the manufacturing process, including the conduct of inter-process tests and inspections,

j) description of subcontracted work and the procedure for its supervision,

k) handling of non-compliant product and complaints, implementation of corrective actions,

l) description of product packaging, transport, storage and marking methods.

The documentation of factory production control should be supplemented with technical documentation, technical specifications (product standards, test standards, European or national technical assessments, etc.), legal regulations.

The quality management system applied by the requirements of PN-EN ISO 9001 can be considered a factory production control system if the requirements of this National Technical Approval are also met.

5.3 Initial type testing

The initial type testing confirms the required performance of the construction product, carried out before placing it on the market and use of the product as well as whenever there is a change in the raw material or in the components or production technology, as well as changes in the FPC system, in situations where they affect the performance of the product.

On the basis of **system 1+ of assessment and verification of constancy of performance** adopted for the product covered by this National Technical Assessment, initial type testing shall be carried out by an accredited testing laboratory.

The scope of the initial type testing shall be all the tests prescribed in section 3 and Table 12.

Positive results of tests carried out in accredited laboratories which in the procedure of **National Technical Assessment CNBOP-PIB-KOT-2018/0056-3703, issue 1** were the basis for determining the performance of the product, may be considered as the initial type examination in the assessment and verification of the constancy of performance of the product.

5.4 End product testing

The testing plan for end products includes ongoing and periodic tests.

5.4.1 Periodic tests

The tests should be carried out in order to periodically check the quality of products and to confirm the stability of production, at least once every 3 years.

Testing scope according to Table 12.

Table 12

No.	Properties	Requirements	Test methods
1.	External appearance, dimensions, marking	According to the manufacturer's documentation	Check
2.	Product structure	According to the manufacturer's documentation	
3.	Maintenance of the circuit integrity of cable lines*	Ability to ensure the fastening of cables and conductors and to maintain the continuity of electricity supply in cable lines under fire conditions for 30, 60, 90 minutes.	According to DIN 4102-12

* The test must be carried out when changes are made to the design covered by this National Technical Assessment

5.4.2 Ongoing tests

Ongoing tests constitute an internal production control measure, as a result of which the manufacturer ensures compliance of the technical properties of the product with the findings of the National Technical Assessment.

The scope of ongoing testing for BAKS cable support structures includes the ongoing tests defined in Table 13.

Table 13

No.	Properties	Requirements	Test methods
1.	External appearance, dimensions, marking	According to the manufacturer's documentation	Check
2.	Product structure	According to the manufacturer's documentation	

The scope of ongoing testing for cables/conductors shall be the ongoing tests defined in the technical approvals and national technical assessments for cables/conductors.

The results of ongoing tests should be systematically recorded and the records of the register should confirm that the products meet the criteria of conformity assessment. Each batch should be uniquely identifiable in the test record.

The manufacturer shall declare the permissible defectiveness of his product in factory production control procedures. Ongoing testing should be carried out in accordance with the agreed testing plan, but at least once for each batch of the product. The size of the batch should be specified in the documentation of factory production control.

5.5 Test methods

Testing of the products should be carried out in accordance with the methods specified in section 3 of this National Technical Assessment. The obtained results shall be compared with the requirements set out in this point. During sample collection, sample preparation and testing, the environmental conditions specified in the normative documents listed in section 3 of this National Technical Assessment should be ensured.

5.6 Collection of samples for tests

Samples for testing should be taken at random, in accordance with PN-N-03010 or any other equivalent standard.

5.7 Evaluation of test results

Manufactured products should be considered compliant with the requirements of this National Technical Assessment if the results of all tests included in section 3 are positive. Results from previous tests carried out in accredited laboratories should also be taken into account in the evaluation of the results if the test methods and the exposure conditions are in accordance with the requirements of this National Technical Assessment.

6 LEGAL INSTRUCTION

6.1 The National Technical Assessment **CNBOP-PIB-KOT-2018/0056-3703 issue 1** is a document confirming the positive assessment of the performance for the intended use of the product named **BAKS cable systems (cable support structures with electric conductors and cables) with the circuit integrity maintenance class of E30, E60, E90 according to DIN 4102-12** in the scope resulting from the provisions of this National Technical Assessment.

6.2 The set of performance characteristics recorded in the National Technical Assessment and their required level constitute the basis for assessment and verification of constancy of performance by the manufacturer and for issuing, under his sole responsibility, a national declaration of performance.

6.3 The National Technical Assessment **CNBOP-PIB-KOT-2018/0056-3703 issue 1** confirms the positive assessment of the product as manufactured by the Applicant and submitted to the procedure for issuing the National Technical Assessment. The procedure for issuing the National Technical Assessment does not change or correct the product by assigning to it requirements other than those declared by the Applicant and other means of testing the performance than those which are actually used in the production process of the product in type testing and ongoing production control.

6.4 The National Technical Approval is not a document authorising the marking of the construction product before market introduction.

6.5 The product shall be delivered to the consignee in accordance with the packaging, storage and transport conditions specified in section 4 of this National Technical Assessment. This condition applies to the Supplier at all stages of product distribution from the manufacturer to the end user.

6.6 The National Technical Assessment does not relieve the manufacturer of products from responsibility for the proper quality of each batch and single unit, and contractors of construction works from responsibility for their proper use.

6.7 The guarantee for the construction product, which is the subject of this National Technical Assessment, shall be granted by the Supplier on the basis of separate regulations.

6.8 The content of leaflets, announcements and other documents related to the marketing and use of the product covered by this National Technical Assessment in the construction industry should include information about the National Technical Assessment issued for this product: **CNBOP-PIB-KOT-2018/0056-3703 issue 1.**

6.9 The CNBOP-PIB National Technical Assessment does not affect the rights resulting from the provisions on industrial property protection, and in particular from the announcement of the Marshal of the Sejm of the Republic of Poland of 17 September 2013 on the announcement of the uniform text of the Act – Industrial Property Law (Dz. U. 2013, No. 0, item 1410). The assurance of these rights is the responsibility of the users of this National Technical Assessment.

6.10 It is the responsibility of the manufacturer to check that the solution which is the subject of the National Technical Assessment does not infringe the rights of third parties.

6.11 Liability for damage caused to anyone by a defect in the product shall be borne by the Manufacturer.

6.12 In relation to the issue of this National Technical Assessment, CNBOP-PIB shall not be held liable for any possible infringement of exclusive and acquired rights.

6.13 CNBOP-PIB may make changes in the performance properties specified in this National Technical Assessment. This shall require a written request, supported by reasons, from the manufacturer and an investigation as appropriate to the changes in scope. It is unacceptable to introduce any changes to the content of the National Technical Assessment made in a manner other than that specified above.

6.14 The CNBOP-PIB National Technical Assessment may be waived by the CNBOP-PIB in case of changes in separate regulations, standards and regulations established by international organisations, if it results from the concluded contracts, significant changes in the scientific basis and the state of practical knowledge and if the positive assessment of the performance properties of the construction product used for its intended purpose is not confirmed in the course of its application. The National Technical Assessment may be repealed on the CNBOP-PIB's own initiative or at the request of the Chief Inspector of Construction Supervision, after an investigation with the participation of the applicant.

7 LIST OF DOCUMENTS USED IN THE PROCEEDINGS

Related documents and standards

PN-EN 1363-1	Fire resistance tests - Part 1: General requirements
DIN 4102-2	Fire performance of construction materials and components – Part 2: Construction components, definitions, requirements and tests
DIN 4102-4	Fire performance of construction materials and components – Part 4: Listing and use of classified construction materials, construction components and special construction components
DIN 4102-12	Fire performance of construction materials and components – Part 12:

Maintenance of the circuit integrity of cable systems – Requirements and tests.

Reports, test reports, assessments, classifications used in the procedure for issuing the National Technical Assessment

1. Test report No. 31/13 of 28.07.2004 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
2. Test report No. 31/15 of 31.08.2005 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
3. Test report No. 31/20 of 21.04.2006 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
4. Test report FIRES-FR-054-06-AUNE of 23.06.2006 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
5. Test report No. 31/22 of 31.07.2006 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
6. Test report FIRES-FR-109-06-AUNE of 09.10.2006 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
7. Test report No. 31/24 of 30.11.2006 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
8. Test report No. 31/25 of 30.11.2006 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
9. Test report No. 31/27 of 30.11.2006 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
10. Test report FIRES-FR-160-06-AUNE of 08.12.2006 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
11. Test report No. 31/29 of 31.01.2007 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
12. Test report No. 31/30 of 31.01.2007 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
13. Test report FIRES-FR-040-07-AUNE of 19.03.2007 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
14. Test report FIRES-FR-086-07-AUNE of 19.06.2007 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
15. Test report FIRES-FR-102-07-AUNE of 12.07.2007 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
16. Test report FIRES-FR-129-07-AUNE of 03.08.2007 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
17. Test report No. 31/34 of 22.08.2007 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
18. Test report FIRES-FR-162-07-AUNE of 20.09.2007 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
19. Test report FIRES-FR-202-07-AUNE of 22.11.2007 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
20. Test report LP-1369/06 of 18.12.2007 from BRI Fire Testing Laboratory, Ksawerów 21, 02-656 Warsaw, Poland.
21. Test report FIRES-FR-234-07-AUNE of 07.01.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
22. Test report FIRES-FR-235-07-AUNE of 14.01.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
23. Test report FIRES-FR-012-08-AUNE of 07.02.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
24. Test report FIRES-FR-061-08-AUNE of 27.05.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.

25. Test report FIRES-FR-063-08-AUNE of 27.05.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
26. Test report FIRES-FR-151-08-AUNE of 27.08.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
27. Test report FIRES-FR-198-08-AUNE of 29.10.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
28. Test report FIRES-FR-257-08-AUNS of 17.12.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
29. Test report FIRES-FR-256-08-AUNE of 19.12.2008 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
30. Test report FIRES-FR-004-09-AUNE of 25.02.2009 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
31. Classification FIRES-CR-020-09-AUPE of 25.05.2009 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
32. Test report FIRES-FR-057-09-AUNE of 09.06.2009 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
33. Classification FIRES-CR-043-09-AUPE of 17.06.2009 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
34. Test report FIRES-FR-094-09-AUNE of 17.07.2009 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
35. Test report No. 31/43 of 30.10.2009 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
36. Test report No. 31/44 of 30.10.2009 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
37. Test certificate No. P-1008 DMT DO of 01.11.2009 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
38. Test report FIRES-FR-198-08-AUNE of 20.01.2010 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
39. Test report No. 31/45 of 30.04.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
40. Test report No. 31/46 of 30.04.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
41. Test report No. 31/47 of 30.04.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
42. Test report No. 31/48 of 30.04.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
43. Test certificate No. P-1009 DMT DO of 18.01.2011 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
44. Test report FIRES-FR-198-08-AUNE of 23.06.2010 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
45. Classification FIRES-CR-043-09-AUPE of 17.08.2010 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
46. Test report No. DMT-DO 31/49 of 30.06.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
47. Test report FIRES-FR-198-08-AUNE of 30.07.2010 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
48. Classification FIRES-CR-043-09-AUPE of 17.10.2010 of Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
49. Test report FIRES-FR-198-08-AUNE of 22.10.2010 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
50. Classification FIRES-CR-043-09-AUPE of 30.11.2010 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
51. Test report No. DMT-DO 31/50 of 25.10.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
52. Test report No. DMT-DO 31/51 of 09.12.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.

53. Test report No. DMT-DO 31/52 of 20.12.2010 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
54. Test report FIRES-FR-044-11-AUNE of 20.05.2011 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
55. Test report FIRES-FR-086-11-AUNE of 21.05.2011 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
56. Test report FIRES-FR-126-11-AUNE of 27.06.2011 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
57. Classification FIRES-CR-114-11-AUPE of 08.07.2011 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
58. Test report FIRES-FR-196-11-AUNE of 26.10.2011 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
59. Test report FIRES-FR-266-11-AUNE of 23.02.2012 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
60. Test report FIRES-FR-020-12-AUNE of 29.02.2012 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
61. Test report FIRES-FR-102-12-AUNE of 18.05.2012 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
62. Classification FIRES-CR-086-12-AUPE of 21.05.2012 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
63. Test report FIRES-FR-135-12-AUNE of 21.07.2012 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
64. Test report FIRES-FR-217-12-AUNE of 27.09.2012 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
65. Test report FIRES-FR-245-12-AUNE of 14.12.2012 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
66. Test report FIRES-FR-005-13-AUNE of 24.01.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
67. Test report No. DMT-DO 31/55 of 31.01.2013 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
68. Test certificate No. P-1010 DMT DO of 07.08.2014 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
69. Test report FIRES-FR-030-13-AUNE of 28.02.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
70. Test report FIRES-FR-060-13-AUNE of 19.04.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
71. Test report FIRES-FR-079-13-AUNE of 06.06.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
72. Classification FIRES-JR-068-13-NURE of 07.06.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
73. Test report FIRES-FR-108-13-AUNE of 12.07.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
74. Classification FIRES-CR-157-13-AUPE of 15.07.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
75. Test report No. DMT 31-58 of 07.08.2013 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
76. Test report FIRES-FR-160-13-AUNE of 26.09.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
77. Classification FIRES-JR-103-13-NURE of 26.09.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
78. Test report FIRES-FR-183-13-AUNE of 25.10.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
79. Classification FIRES-JR-116-13-NURE of 25.10.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
80. Test report FIRES-FR-204-13-AUNE of 19.11.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.

81. Classification FIRES-JR-127-13-NURE of 19.11.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
82. Test report FIRES-FR-224-13-AUNE of 02.12.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
83. Classification FIRES-CR-232-13-AUPE of 13.12.2013 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
84. Test report DMT 31-53 of 19.12.2013 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
85. Test certificate No. P-1012 DMT DO of 17.04.2014 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
86. Test report DMT 31-57 of 19.12.2013 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
87. Test report DMT 31-60 of 15.01.2014 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
88. Test certificate No. P-1013 DMT DO of 17.04.2014 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
89. Test report FIRES-FR-016-14-AUNE of 30.01.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
90. Classification FIRES-JR-007-14-NURE of 13.04.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
91. Test report FIRES-FR-049-14-AUNE of 04.04.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
92. Classification FIRES-JR-022-14-NURE of 12.05.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
93. Test report DMT-31-59 of 25.04.2014 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
94. Test certificate No. P-1022 DMT DO of 17.05.2017 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
95. Test report DMT 31-61 of 20.05.2014 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
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97. Test report FIRES-FR-066-14-AUNE of 23.05.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
98. Classification FIRES-JR-038-14-NURE of 27.05.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
99. Test report FIRES-FR-098-14-AUNE of 27.05.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
100. Classification FIRES-JR-045-14-NURE of 30.05.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
101. Test report FIRES-FR-129-14-AUNE of 17.07.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
102. Classification FIRES-JR-070-14-NURE of 20.08.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
103. Test report DMT 31-70 of 04.08.2014 from DMT GmbH - Fachstelle Für Brandschutz in Tremoniastrasse 13, 44137 Dortmund, Germany.
104. Test report FIRES-FR-143-14-AUNE of 22.08.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
105. Classification FIRES-CR-104-14-AUPE of 07.10.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
106. Test report FIRES-FR-156-14-AUNE of 28.08.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
107. Test report FIRES-FR-174-14-AUNE of 21.11.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
108. Classification FIRES-JR-093-14-NURE of 12.12.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.

109. Test report MPA 3200/090/14 of 15/12/2017 from MPA Braunschweig, Beethovenstrasse 52, D-38103 Braunschweig
110. Test report MPA 3732/632/14 of 20/12/2017 from MPA Braunschweig, Beethovenstrasse 52, D-38103 Braunschweig
111. Test report FIRES-FR-243-14-AUNE of 26.01.2015 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
112. Classification FIRES-JR-110-14-NURE of 03.02.2015 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
113. Test report FIRES-FR-225-14-AUNE of 22.12.2014 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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115. Test report MPA 3593/674/14 of 18/07/2014 from MPA Braunschweig, Beethovenstrasse 52, D-38103 Braunschweig
116. Test report FIRES-FR-010-15-AUNE of 06.03.2015 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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124. Test report FIRES-FR-062-15-AUNE of 26.05.2015 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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126. Test report MPA 2400/062/15 of 20/12/2017 from MPA Braunschweig, Beethovenstrasse 52, D-38103 Braunschweig
127. Test report FIRES-FR-112-15-AUNE of 01.07.2015 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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137. Classification FIRES-JR-084-15-NURE of 22.06.2015 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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143. Test report FIRES-FR-202-15-AUNE of 12.01.2016 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
144. Classification FIRES-JR-108-15-NURE of 16.02.2016 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
145. Test report FIRES-FR-018-16-AUNE of 26.04.2016 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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147. Test report FIRES-FR-029-16-AUNE of 29.04.2016 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
148. Classification FIRES-CR-042-16-AUPE of 03.06.2016 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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164. Test report MPA 2401/117/16 of 15/02/2018 from MPA Braunschweig, Beethovenstrasse 52, D-38103 Braunschweig

165. Test report FIRES-FR-135-16-AUNE of 16.08.2016 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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172. Test report FIRES-FR-285-16-AUNE of 02.03.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
173. Classification FIRES-JR-009-17-NURE of 03.03.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
174. Test report FIRES-FR-015-17-AUNE of 29.03.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
175. Classification FIRES-CR-019-17-AUPE of 16.02.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
176. Test report FIRES-FR-037-17-AUNE of 25.04.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
177. Classification FIRES-CR-050-17-AUPE of 28.04.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
178. Test report FIRES-FR-100-17-AUNE of 02.06.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
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180. Test report FIRES-FR-131-17-AUNE of 27.11.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
181. Classification FIRES-JR-084-17-NURE of 28.11.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
182. Test report FIRES-FR-153-17-AUNE of 31.08.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
183. Classification FIRES-JR-096-17-NURE of 21.09.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
184. Test report FIRES-FR-189-17-AUNE of 16.11.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
185. Classification FIRES-JR-119-17-NURE of 19.12.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
186. Test report FIRES-FR-206-17-AUNE of 14.12.2017 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
187. Classification FIRES-JR-145-17-NURE of 12.01.2018 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
188. Test report FIRES-FR-241-17-AUNE of 25.01.2018 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
189. Classification FIRES-JR-161-17-NURE of 05.03.2018 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.
190. Test report FIRES-FR-068-18-AUNE of 14.05.2018 from Fires, s.r.o. Osloboditel, ov 282, 059 35 Batizovce, Slovakia.

Documentation

No.	Document name	Document no.	Date

No.	Document name	Document no.	Date
1.	Application for issuing a National Technical Assessment together with annexes	0033/DOT/KOT/2018	26.03.2018

ANNEXES

Annex 1 Standard support structures

Annex 2 Special support structures

Annex 3 Connection of cable trays and racks, channels and wire mesh trays

Annex 1

Standard support structures

<table>
<tr>
<td>KCP/KCOP…H60
Cable tray
- sheet thickness 1.5 mm
- max. width 300 mm
- horizontal mounting
- load capacity 10 kg/m
A1
 </td>
<td>DGOP…H60
Cable rack
- sheet thickness 1.5 mm
- max. width 400 mm
- vertical and horizontal mounting
- load capacity 20 kg/m
A2
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<tr>
<td colspan="2">Support spacing max. 1.2 m
Ceiling structures</td>
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 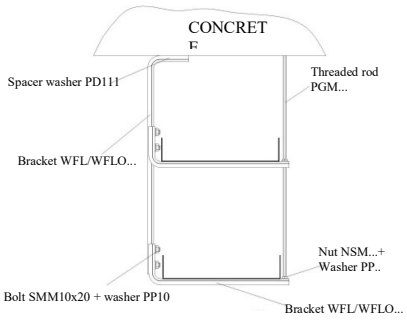

- maximum two route levels
- maximum load capacity of the structure 48 kg
- max. load per extension bracket 24 kg
- maximum extension bracket length 400 mm.</td>
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 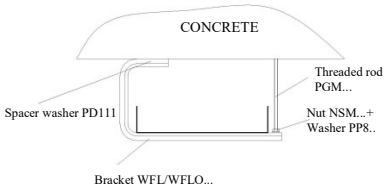

- maximum one route level
- maximum load capacity of the structure 24 kg
- maximum length of (extension) bracket 400mm</td>
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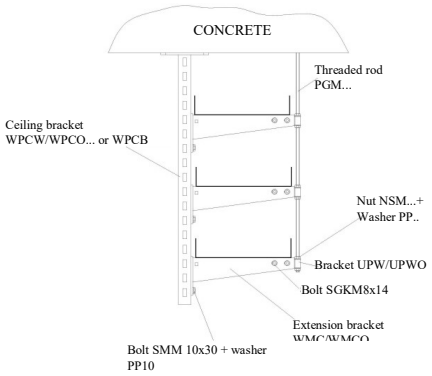
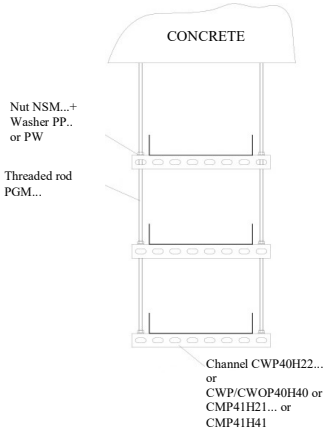
3



- maximum three route levels
- maximum load capacity of the structure 72 kg
- max. load per extension bracket 24 kg
- maximum extension bracket length 400 mm

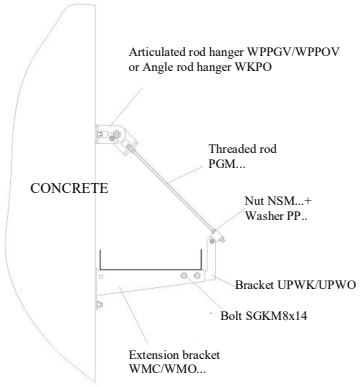
4



- maximum three route levels
- maximum load capacity of the structure 72 kg
- maximum load capacity per level 24 kg
- maximum channel length 500 mm

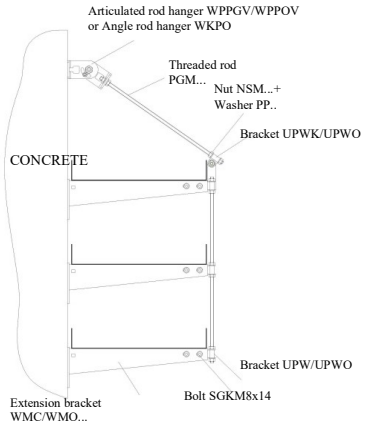
Support spacing max. 1.2 m
Wall structures

5



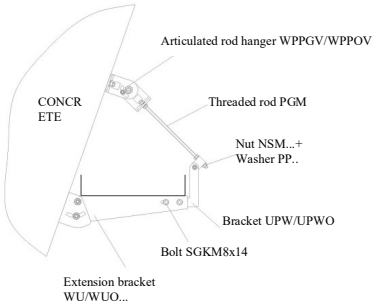
- maximum load capacity of the structure 24 kg
- maximum extension bracket length 400 mm

6



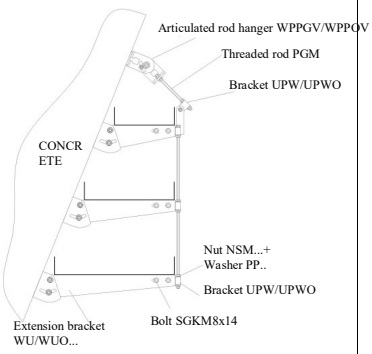
- maximum three route levels
- maximum load capacity of the structure 72 kg
- max. load per extension bracket 24 kg
- maximum extension bracket length 400 mm

7



- maximum load capacity of the structure 24 kg
- maximum extension bracket length 400 mm

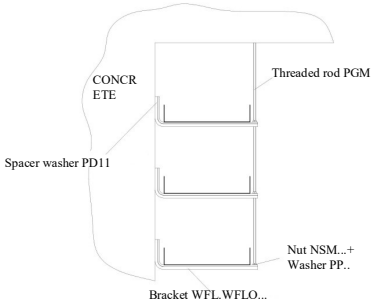
8



- maximum three route levels
- maximum load capacity of the structure 72 kg
- max. load per extension bracket 24 kg
- maximum extension bracket length 400 mm

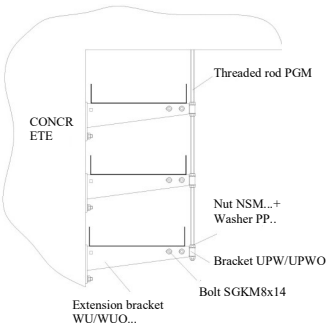
Support spacing max. 1.2 m
Wall and ceiling structures

9



- maximum three route levels
- maximum load capacity of the structure 72 kg
- maximum load per bracket/boom 24 kg
- maximum length of (extension) bracket 400 mm

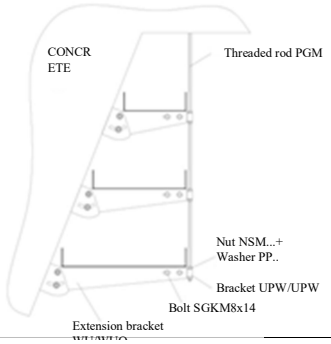
10



- maximum three route levels
- maximum load capacity of the structure 72 kg
- maximum load per bracket/boom 24 kg
- maximum length of (extension) bracket 400mm

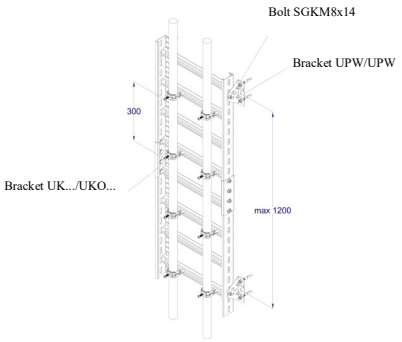
11

- maximum three route levels
- maximum load capacity of the structure 72 kg
- maximum load per bracket/boom 24 kg
- maximum length of (extension) bracket 400mm

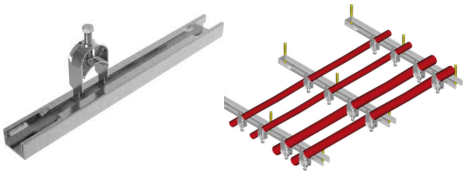


Support spacing max. 1.2 m
Vertical structures

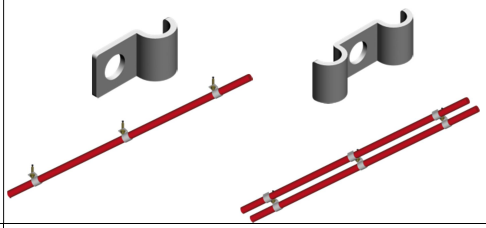
12



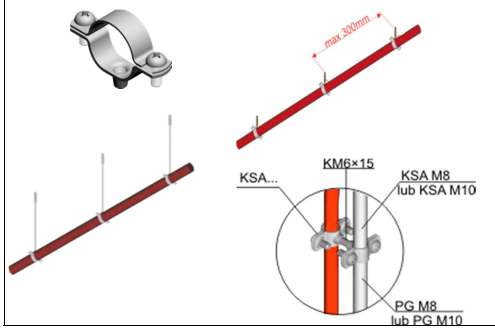
SD/SDO... + UK/UKO...
B1
Rung + bracket
- rung spacing max. 300 mm
- cable/conductor routing
vertical and horizontal
- cable routing on walls and ceilings



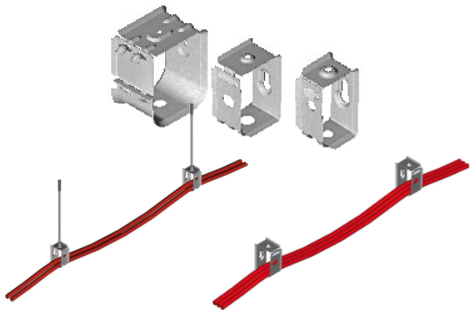
UDF..., UEF...
B2
Cable clip
- bracket spacing max. 300 mm
- cable/conductor routing
vertical and horizontal
- cable routing on walls and ceilings



KSA...
B3
Cable clamp
- spacing between clamps max. 300 mm
- cable/conductor routing
vertical and horizontal
- cable routing on walls and ceilings



OZ/OZO, OZS/OZSO, OZM/OZMO
B4
Cable clamp
- spacing between clamps max. 300 mm
- cable/conductor routing
level
- cable routing on walls and ceilings



CLASSIFICATION OF CABLE ASSEMBLIES ON STANDARD CABLE SUPPORTING STRUCTURES

	Cable type	A1	A2	B1	B2	B3	B4
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90
	(N)HXH = (N)HXH-J	E90	E90	E60	E90	E90	
	NHXCH	E90	E90	E90	E90	E90	E90
	(N)HXCH	E90	E90	E60	E90		
	JE-H(St)H	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90		E90
	HDGsekwf	E90	E30	E90	E90		E30
	HTKSH	E90	E90	E90	E90		E90
	HTKSHekw	E90	E90	E90	E90		E90
	HLGsekwf	E60	E90	E30	E90		
	PGI-H	E90	E60		E90		
DÄTWYLER	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	(N)HXH	E90	E90	E60	E60	E30	E90
	(N)HXCH	E90		E60		E90	E90
	JE-H(St)H	E90	E60	E30		E30	
	JE-H(St)HRH	E30	E90				
ELKOND	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	NHXH = NHXH-J (1.5-10mm²)	E90	E90				
	N2XH P30	E90	E90		E60		
	N2XH P60	E90	E90				
	JE-H(st)H	E90	E90		E90		
	1-CXKH-V (1.5-10mm²)	E90	E90		E90		E90
	SHXKFH-V180	E90	E90		E90		E90
ELPAR	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	NHXH = NHXH-J	E90	E30	E90	E90		
	(N)HXH = (N)HXH-J	E90	E90	E90	E90		
	NHXCH	E90	E90	E90	E90		
	(N)HXCH	E60	E90	E90	E90		
	HDGs	E90	E90	E90	E90		
	HTKSH	E90	E30	E90	E90		
EUPEN	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	(N)HXH = (N)HXH-J	E90	E90	E90		E90	
	(N)HXH = (N)HXH-J	E90	E90	E90		E90	
	JE-H(st)H	E90	E90	E90		E90	
CABLOT	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	NHXH = NHXH-J	E90	E90	E90		E90	
	NHXCH	E90	E90	E90		E90	
	JE-H(St)H	E90	E90	E90		E90	
	LINCH		E90				
MADEX	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	NHXH - NHXH-J	E90	E60	E60	E90	E60	
	NHXCH	E90	E90	E90	E90	E90	
	HTKSH	E90	E90	E90	E90	E90	
	HTKSHekw	E30	E90	E60	E90	E90	
NKT	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90
PRAKAB	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	PRAFlaDur 1-CCXKH-V180	E90	E90	E90	E90	E90	E90
	NHXH = NHXH-J				E90		
LEONI STUDER	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	(N)HXH = (N)HXH-J	E90	E90	E90	E90		
	(N)HXCH	E90	E90	E90	E90		E90
	(N)HXCH E30	E30					E60
	JE-H(St)H	E90	E60	E90	E90		E90
	JE-H(St)HRH	E90	E30	E90	E90		E90
TECHNOKABEL	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	NHXH = NHXH-J	E90	E90	E90		E90	E90
	NHXH E30 = NHXH-J E30	E90	E60	E90	E90		E90
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90
	(N)HXH E30 = (N)HXH-J E30	E90	E90	E60			
	NHXCH	E90	E90	E90			E90
	NHXCH E30	E90	E60	E90			E60
	(N)HXCH	E90	E90	E90			

	(N)HXCH E30	E90	E90	E90			
	(N)HXCH-J SERVO	E90			E90	E90	E90
	NHXHRHX = NHXHRHX-J				E90		
	JE-H(St)H	E90	E90	E90	E30		E90
	HDGs	E90	E90		E90		E90
	HDGszo	E90	E90	E90	E90		
	HDGszo-W	E90			E90		E90
	HDGsekw		E30				
	HDGsekwżo	E30		E90	E90		
	HTKSH	E90	E90	E90	E90	E90	E90
	HTKSH E30	E90	E90	E60	E30		E90
	HTKSHekw	E90	E90	E90	E90	E90	E90
	HTKSHekw E30	E90	E90	E30	E60		E60
	HTKGs E30						E90
	HLGs	E90	E90	E90	E90		
	HLGszo	E90	E30				
	HLGsekw	E30	E30	E90			E90
TELEFONIKA	**Typ kabla**	**A1**	**A2**	**B1**	**B2**	**B3**	**B4**
	NHXH = NHXH-J	E90	E90	E90	E90		
	NHXCH	E90	E90	E90	E90		
	(N)HXH = (N)HXH-J	E60	E90			E90	E90
	(N)HXCH	E90	E60			E90	E90
	N2XH	E90	E90				
	JE-H(St)H	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90			E90	
	HTKSH	E90	E90				E60
	HLGsekw						E30

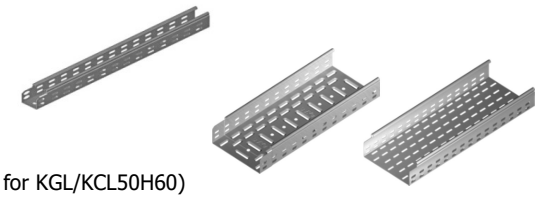
On the basis of DIN 4102-12:1998-11, it is possible to transfer the results of the maintenance tests for electric cables or wires laid on standardized load-bearing structures in accordance with DIN 4102-12:1998-11 to standardized cable bearing structures of other manufacturers.

The classifications of the cable assemblies according to DIN 4102-12, depending on the standardized cable supporting structure and the cable used, are described in the CNBOP-PIB Technical Approvals and National Technical Assessments for the cable assemblies.

Annex 2

Special load-bearing structures

KGL/KGOL...H60
KCL/KCOL...H60
KGL/KCL50H60
Cable tray
- sheet thickness 0.7 mm
- width 50 - 300 mm
- horizontal mounting
- load capacity 20 kg/m (5 kg for KGL/KCL50H60)

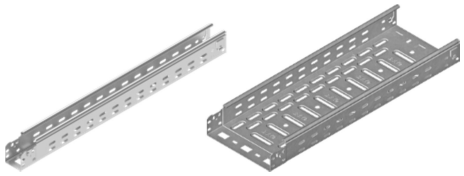


C

CWP/CWOP40H40 Perforated section
- channel sheet thickness 1.5 mm
- horizontal mounting
- load capacity 5 kg/m

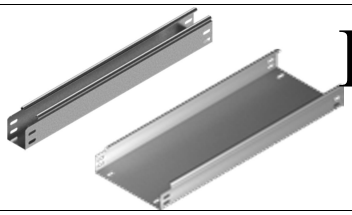
D

KFL...H60
Cable tray
- sheet thickness 0.7 mm
- width 50 - 300 mm
- horizontal mounting
- load capacity 20 kg/m
(5 kg for KFL50H60)



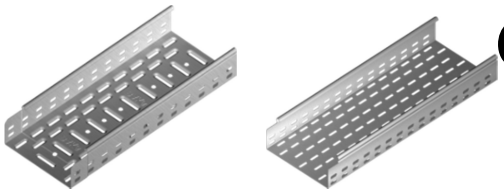
E

KBL...H60
Cable tray
- sheet thickness 0.7 mm
- width 50 - 300 mm
- horizontal mounting
- load capacity 20 kg/m (5[kg/m] for KBL50H60)



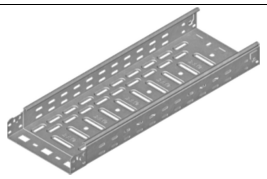
F

KGJ/KGOJ...H60
KCJ/KCOJ...H60
Cable tray
- sheet thickness 1 mm
- width 100 - 400 mm
- horizontal mounting
- load capacity 20 kg/m

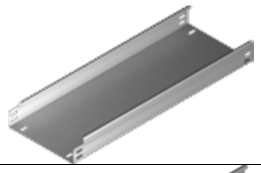
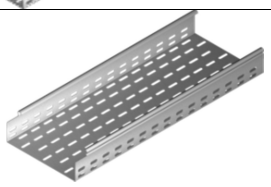
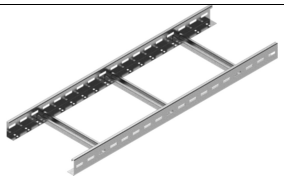
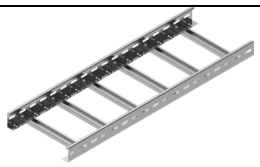
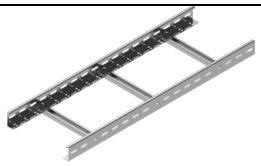
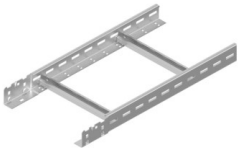


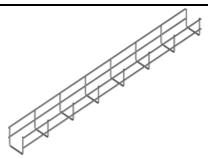
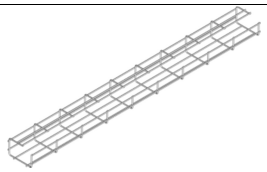
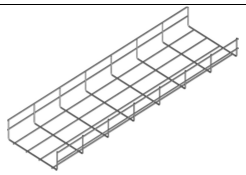
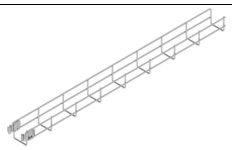
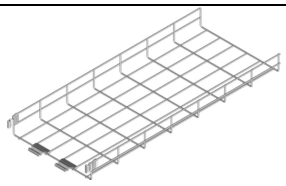
G

KFJ...H60
Cable tray
- sheet thickness 1 mm
- width 100 - 400 mm
- horizontal mounting
- load capacity 20 kg/m



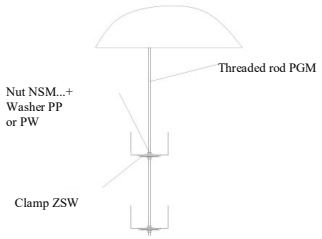
H

KBJ...H60 Cable tray - sheet thickness 1 mm - width 100 - 400 mm - horizontal mounting - load capacity 20 kg/m		**I**
KCD/KCOD...H60 Cable tray - sheet thickness 1.2 mm - width 100 - 400 mm - horizontal mounting - load capacity 10 kg/m		**J**
KCP/KCOP...H60 Cable tray - sheet thickness 1.5 mm - width 100 - 600 mm - horizontal mounting - load capacity 25 kg/m		**K**
DUD Cable rack - sheet thickness 1.2 mm - width 100 - 400 mm - vertical and horizontal mounting - load capacity 25 kg/m		**L**
DGOD Cable rack - sheet thickness 1.2 mm - width 100 - 400 mm - vertical and horizontal mounting - load capacity 20 kg/m		**M**
DUP/DUOP...H60 **DUP...H60** Cable rack - sheet thickness 1.5 mm - width 100 - 600 mm - vertical and horizontal mounting - load capacity 30 kg/m (40 kg/m)		**N**
DGOP Cable rack - sheet thickness 1.5 mm - width 100 - 600 mm - vertical and horizontal mounting - load capacity 20 kg/m		**O**
DFP Cable rack - sheet thickness 1.5 mm - width 100 - 400 mm - horizontal mounting - load capacity 20 kg/m		**P**

KDS/KDSO60H60 **KSG60H60** Mesh tray - vertical and horizontal mounting - load capacity 2 kg/m		**R**
KGS...H60 Mesh tray - horizontal mounting - load capacity 5 kg/m - width 60-100mm		**S**
KDS/KDSO...H60 **KSG...H60** Mesh tray - width 100 - 600 mm - vertical and horizontal mounting - load capacity 20 kg/m		**T**
KDSZ60H60 Mesh tray - horizontal mounting - load capacity 2 kg/m		**U**
KDSZ...H60 Mesh tray - width 100 - 400 mm - horizontal mounting - load capacity 20 kg/m		**W**

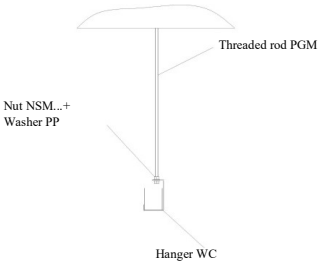
Ceiling structures

1



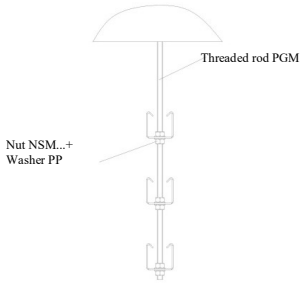
- maximum two route levels
- maximum load capacity of the structure 15 kg
- maximum load capacity per level 15 kg
- maximum tray width 100 mm
- maximum support spacing 1.5 m

2



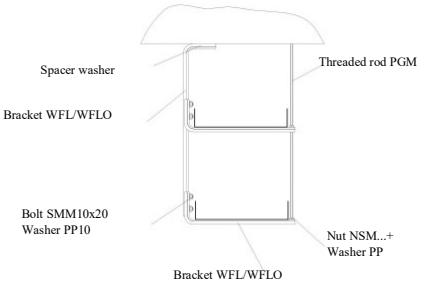
- maximum load capacity of the structure 7.5 kg
- maximum support spacing 1.5 m

3



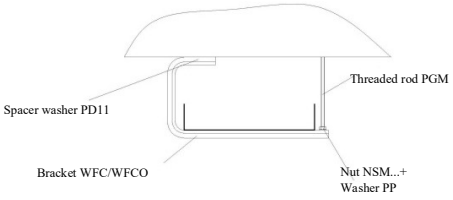
- maximum three route levels
- maximum load capacity of the structure 22.5 kg
- maximum load capacity per level 7.5 kg
- maximum support spacing 1.5 m
- possibility of fixing devices of the fire safety system to the channel base

4



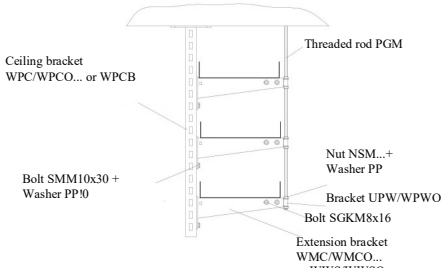
- maximum two route levels
- maximum load capacity of the structure 60 kg
- max. load per extension bracket 30 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

5



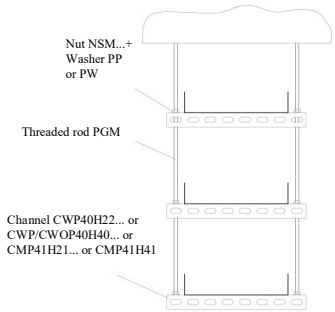
- maximum one route level
- maximum load capacity of the structure 30 kg
- maximum length of (extension) bracket 400mm
- maximum support spacing 1.5 m

6



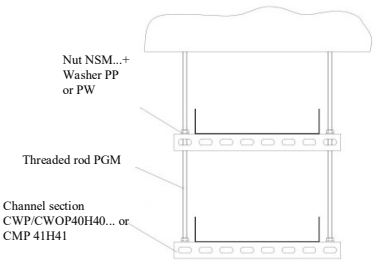
- maximum three route levels
- maximum load capacity of the structure 97.5 kg
- maximum extension bracket load capacity 37,5 kg
- maximum extension bracket length 400mm (600mm for WMC/WMCO)
- it is possible to run routes on both sides of the support
- maximum support spacing 1.5 m

7



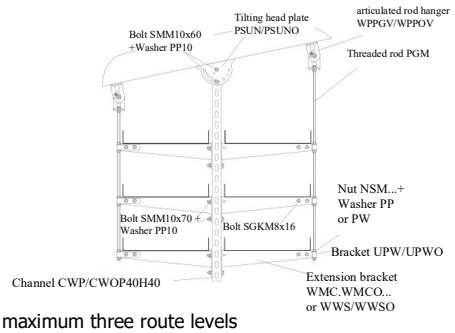
- maximum three route levels
- maximum load capacity of the structure 100 kg
- maximum load per channel 45 kg
- maximum channel length 700mm
- maximum support spacing 1.5 m

8



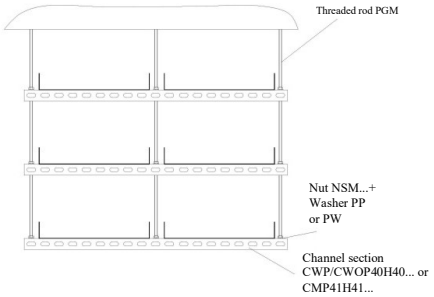
- maximum two route levels
- maximum load capacity of the structure 68 kg
- maximum load per channel 34 kg
- maximum channel length 500mm
- maximum support spacing 1.7 m

9



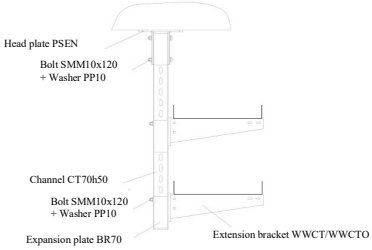
- maximum three route levels
- maximum load capacity of the structure 150 kg
- max. load per extension bracket 30 kg
- maximum extension bracket length 400mm (600mm for WMC/WMCO)
- maximum support spacing 1.5 m

10



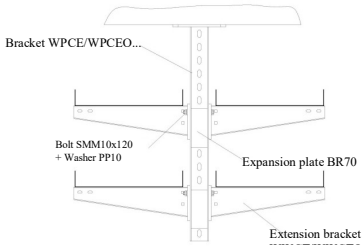
- maximum three route levels
- maximum load capacity of the structure 150 kg
- maximum load per route 30 kg
- maximum PGM rods spacing 650 mm
- maximum support spacing 1.5 m

11



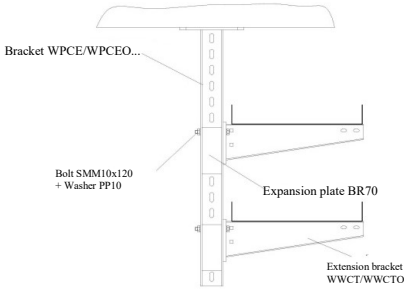
- maximum two route levels
- maximum load capacity of the structure 60 kg
- max. load per extension bracket 30 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

12



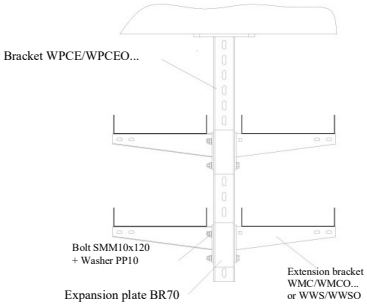
- maximum two route levels
- maximum load capacity of the structure 120 kg
- max. load per extension bracket 30 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

13



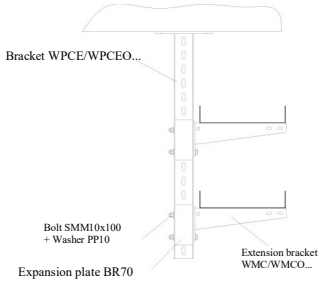
- maximum two route levels
- maximum load capacity of the structure 60 kg
- max. load per extension bracket 30 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

14



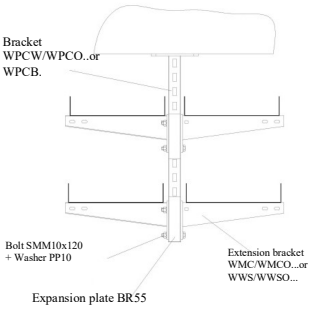
- maximum two route levels
- maximum load capacity of the structure 60 kg
- max. load per extension bracket 15 kg
- maximum extension bracket length 300 mm
- maximum support spacing 1.5 m

15



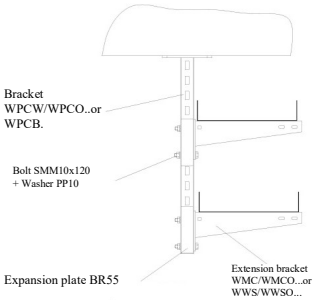
- maximum two route levels
- maximum load capacity of the structure 30 kg
- max. load per extension bracket 15 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

16



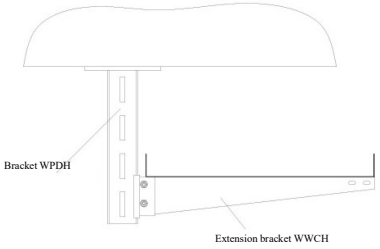
- maximum two route levels
- maximum load capacity of the structure 60 kg
- max. load per extension bracket 15 kg
- maximum extension bracket length 300 mm
- maximum support spacing 1.5 m

17



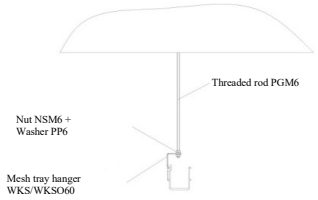
- maximum two route levels
- maximum load capacity of the structure 30 kg
- max. load per extension bracket 15 kg
- maximum extension bracket length 300 mm
- maximum support spacing 1.5 m

18



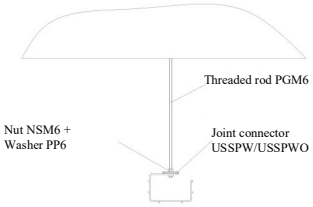
- maximum one route level
- max. load of the structure / extension bracket 30 kg
- maximum extension bracket length 600 mm
- maximum support spacing 1.5 m

19



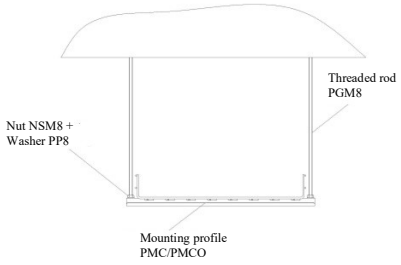
- maximum load capacity of the structure 3 kg
- it is possible to fix the hanger directly to the ceiling
- maximum support spacing 1.5 m

20



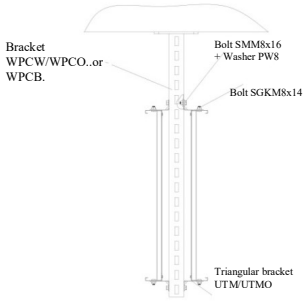
- maximum load capacity of the structure 7.5 kg
- it is possible to fix the tray directly to the ceiling
- maximum support spacing 1.5 m

21



- maximum one route level
- maximum load capacity of the structure 30 kg
- maximum length of PMC/PMCO profile - 400 mm
- maximum support spacing 1.5 m

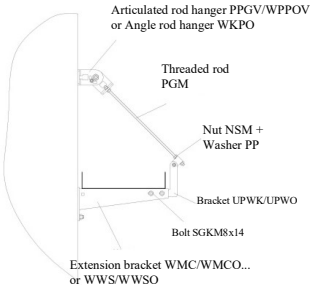
22



- maximum load capacity of the structure 60 kg
- maximum load capacity per rack 30 kg
- single-sided construction (with one rack) possible
- maximum support spacing 1.5 m
- the cables should be fixed with UK/UKO brackets... max every 600 mm
- maximum rack width 600 mm

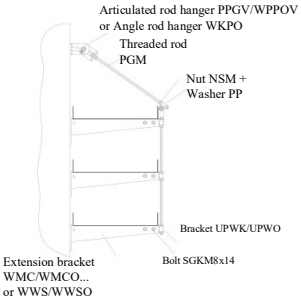
Wall structures

23



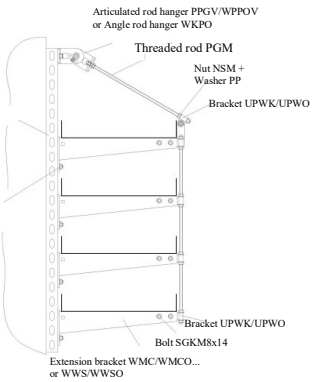
- maximum extension bracket load capacity 30 kg
- maximum extension bracket length 400mm (600mm for WMC/WMCO)
- maximum support spacing 1.5 m

24



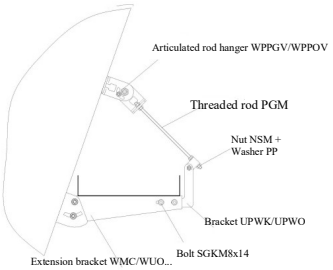
- maximum three route levels
- maximum extension bracket load capacity 30 kg
- maximum load capacity of the structure 90 kg
- maximum extension bracket length 400mm (600mm for WMC/WMCO)
- maximum support spacing 1.5 m

25



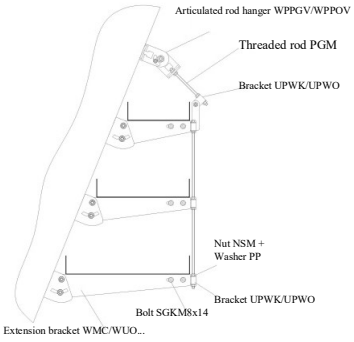
- maximum four route levels
- maximum extension bracket load capacity 30 kg
- maximum load capacity of the structure 120 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

26



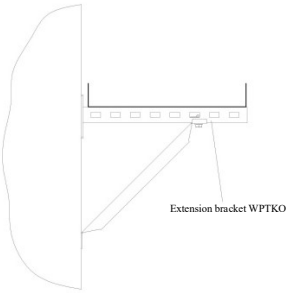
- maximum extension bracket load capacity 30 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

27



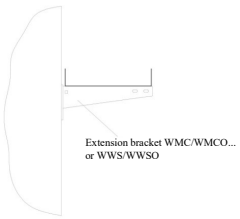
- maximum three route levels
- maximum extension bracket load capacity 30 kg
- maximum load capacity of the structure 90 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

28



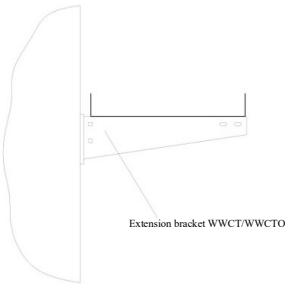
- maximum extension bracket load capacity 30 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

29



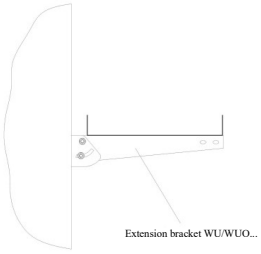
- maximum extension bracket load capacity 15 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

30



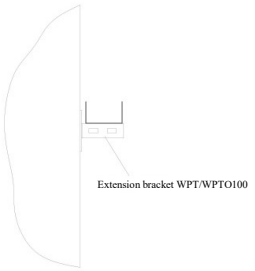
- maximum extension bracket load capacity 15 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

31



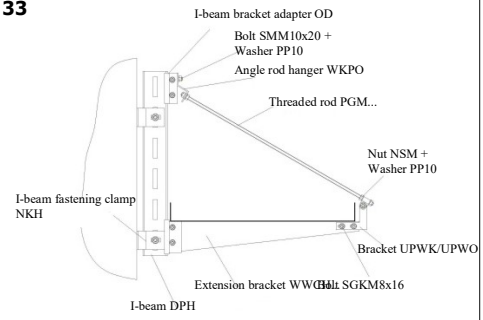
- maximum extension bracket load capacity 15 kg
- maximum extension bracket length 300 mm
- maximum support spacing 1.5 m

32



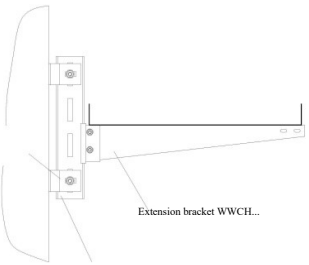
- maximum extension bracket load capacity 15 kg
- maximum extension bracket length 100 mm
- maximum support spacing 1.5 m

33



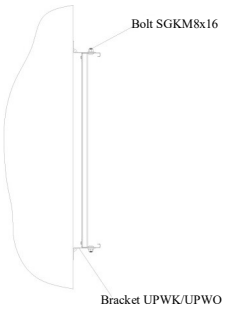
- maximum extension bracket load capacity 30 kg
- maximum extension bracket length 600 mm
- maximum support spacing 1.5 m

34



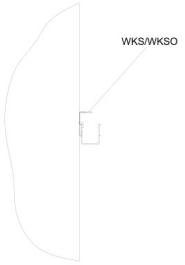
- maximum extension bracket load capacity 30 kg
- maximum extension bracket length 600 mm
- maximum support spacing 1.5 m

35



- maximum load capacity of the structure 30 kg
- maximum support spacing 1.5 m
- the cables should be fixed with UK/UKO brackets... max every 600 mm
- maximum rack width 600 mm

36



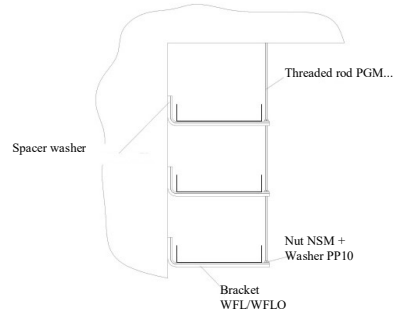
- maximum load capacity of the structure 3 kg
- maximum support spacing 1.5 m

37

- maximum load capacity of the structure 3 kg
- maximum support spacing 1.5 m

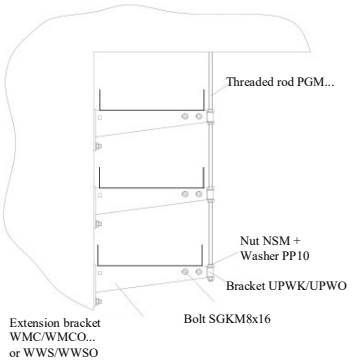
Wall and ceiling structures

38



- maximum three route levels
- maximum load per (extension) bracket 30 kg
- maximum load capacity of the structure 90 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m

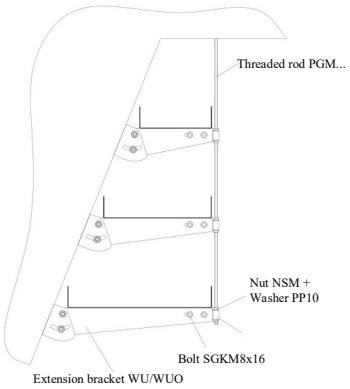
39



- maximum three route levels
- maximum extension bracket load capacity 37,5 kg
- maximum load capacity of the structure 97.5 kg
- maximum extension bracket length 400 mm
(600 mm for WMC/WMCO)
- maximum support spacing 1.5 m

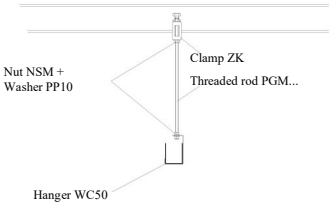
40

- maximum three route levels
- maximum load per (extension) bracket 30 kg
- maximum load capacity of the structure 90 kg
- maximum extension bracket length 400 mm
- maximum support spacing 1.5 m



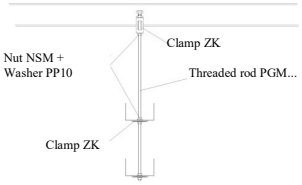
Fixing to steel structure

41



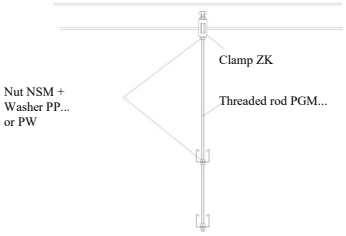
- maximum load per hanger 7.5 kg
- maximum support spacing 1.5 m

42



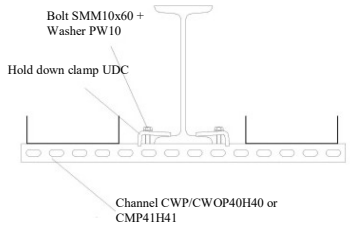
- maximum two route levels
- maximum load capacity per level 15 kg
- maximum load capacity of the structure 15 kg
- maximum tray width 100 mm
- maximum support spacing 1.5 m

43



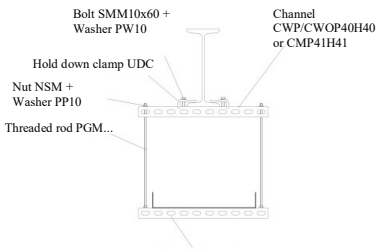
- maximum two route levels
- maximum load capacity of the structure 15 kg
- maximum load capacity per level 7.5 kg
- maximum support spacing 1.5 m
- possibility of fixing devices of the fire safety system to the channel base

44



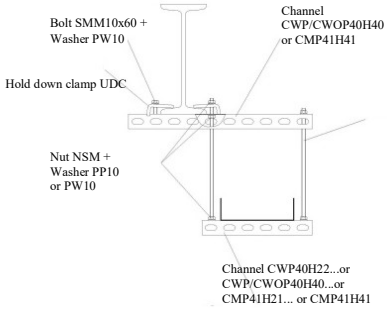
- maximum one-sided load capacity of the channel 15kg
- maximum load capacity of the structure 30 kg
- maximum route width 200 mm
- maximum support spacing 1.5 m

45



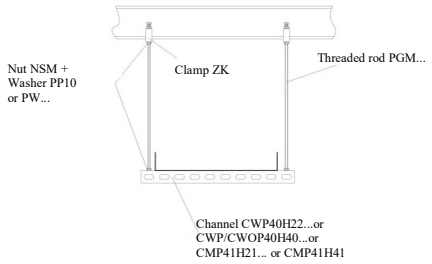
- maximum one route level
- maximum load capacity of the structure 15 kg
- maximum support spacing 1.5 m
- maximum route width 400 mm

46



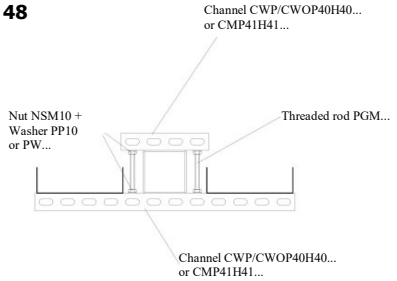
- maximum one route level
- maximum load capacity of the structure 15 kg
- maximum support spacing 1.5 m
- maximum route width 200 mm

47



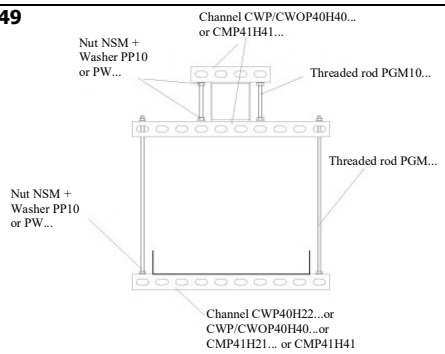
- maximum one route level
- maximum load capacity of the structure 30 kg
- maximum support spacing 1.5 m
- maximum route width 400 mm

48



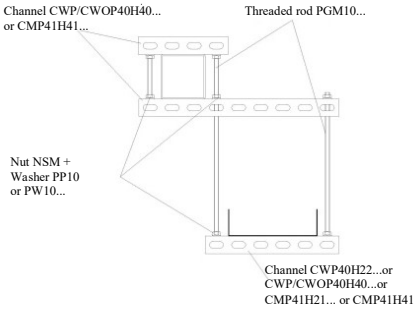
- maximum one-sided load capacity of the channel 15kg
- maximum load capacity of the structure 30 kg
- maximum route width 200 mm
- maximum support spacing 1.5 m

49



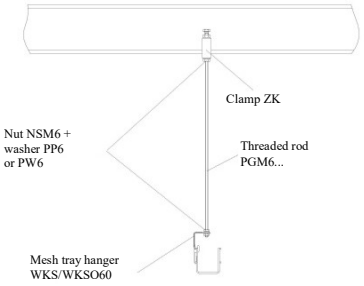
- maximum one route level
- maximum load capacity of the structure 15 kg
- maximum support spacing 1.5 m
- maximum route width 400 mm

50



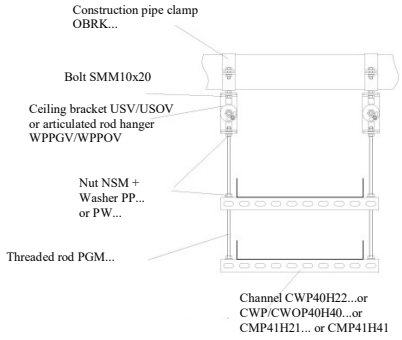
- maximum one route level
- maximum load capacity of the structure 15 kg
- maximum support spacing 1.5 m
- maximum route width 200 mm

51



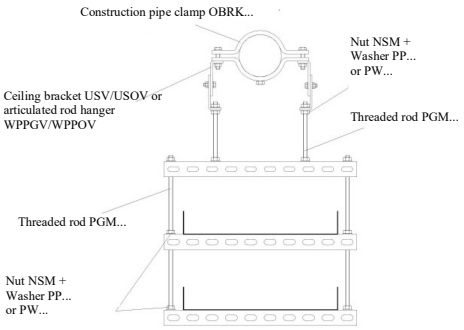
- maximum load capacity of the structure 3 kg
- maximum support spacing 1.5 m

52



- maximum two route levels
- maximum load capacity per level 15 kg
- maximum load capacity of the structure 30 kg
- maximum support spacing 1.5 m
- maximum route width 400 mm

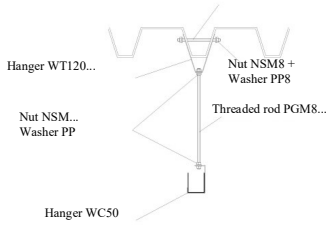
53



- maximum two route levels
- maximum load capacity per level 15 kg
- maximum load capacity of the structure 30 kg
- maximum support spacing 1.5 m
- maximum route width 400 mm

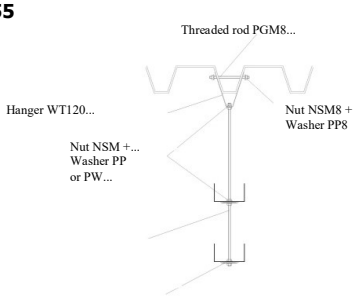
Fixing to trapezoidal sheet

54



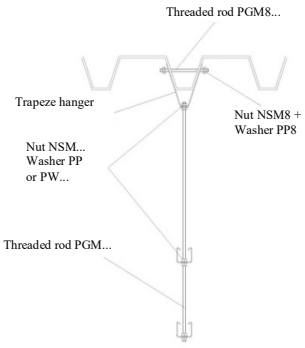
- maximum load per hanger 7.5 kg
- maximum support spacing 1.5 m

55



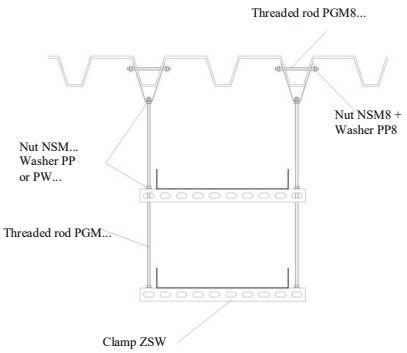
- maximum two route levels
- maximum load capacity per level 15 kg
- maximum load capacity of the structure 15 kg
- maximum tray width 100 mm
- maximum support spacing 1.5 m

56



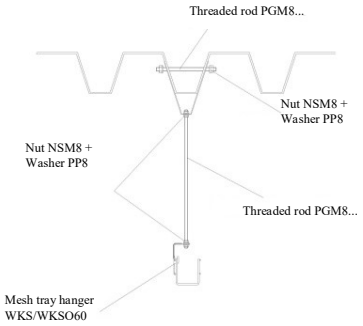
- maximum two route levels
- maximum load capacity of the structure 15 kg
- maximum load capacity per level 7.5 kg
- maximum support spacing 1.5 m
- possibility of fixing devices of the fire safety system to the channel base

57



- maximum two route levels
- maximum load capacity per level 15 kg
- maximum load capacity of the structure 30 kg
- maximum support spacing 1.5 m
- maximum route width 400 mm

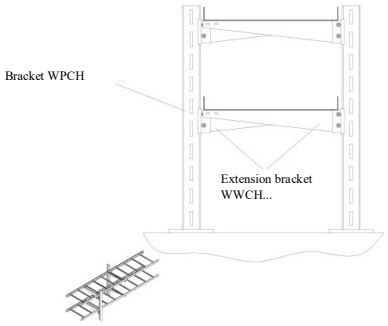
58



- maximum load capacity of the structure 3 kg
- maximum support spacing 1.5 m

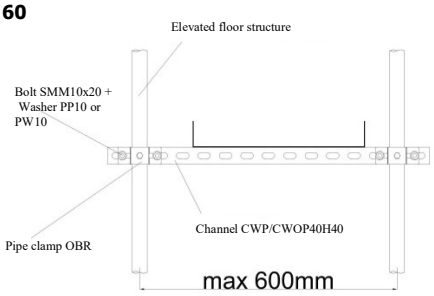
Fixing to floor or elevated floor structure

59



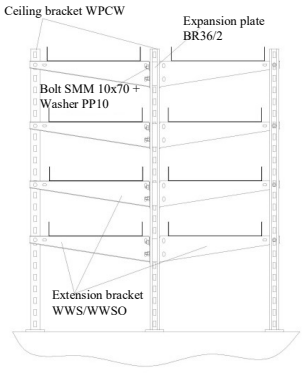
- maximum two route levels
- maximum load capacity per level 40 kg
- maximum load capacity of the structure 80 kg
- maximum support spacing 1.0 m
- maximum route width 600 mm

60



- maximum load capacity of the structure 24 kg
- maximum support spacing 1.2 m

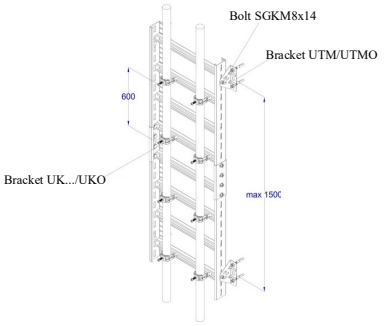
61



- maximum four route levels
- maximum load capacity per level 30 kg
- maximum load capacity of the structure 240 kg
- maximum support spacing 1.5 m
- maximum route width 400 mm
- maximum height of the brackets 1,5 m
- it is possible to run routes on one side of the structure

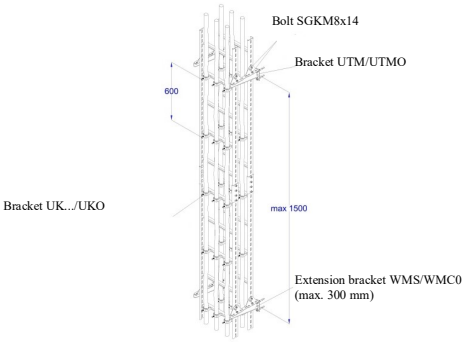
Vertical structures

62



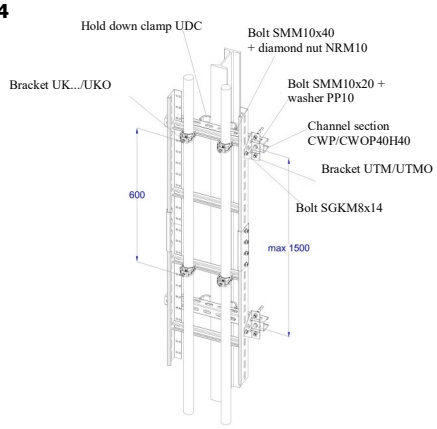
- maximum load capacity of the support structure 30 kg
- maximum rack width 400 mm

63



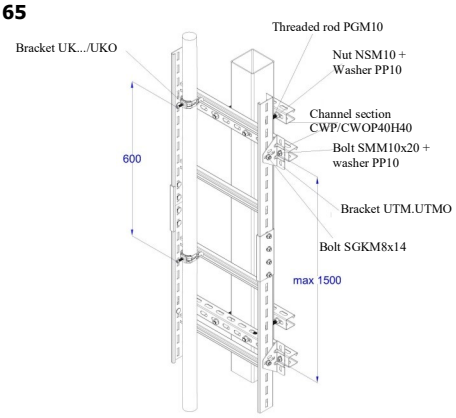
- maximum load capacity of the support structure 60 kg
- maximum load capacity per rack 30 kg
- maximum rack width 400 mm

64



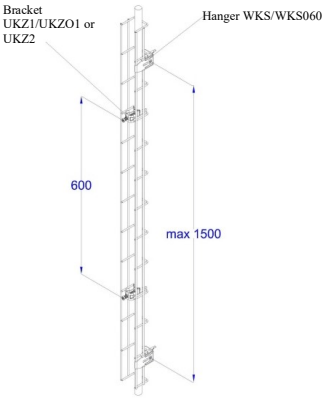
- maximum load capacity of the support structure 30 kg
- maximum rack width 400 mm

65



- maximum load capacity of the support structure 30 kg
- maximum rack width 400 mm

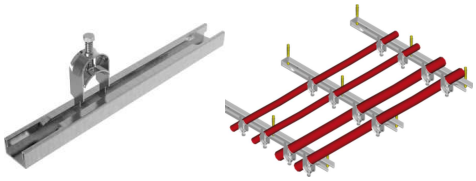
67



- maximum load capacity of the structure 3 kg

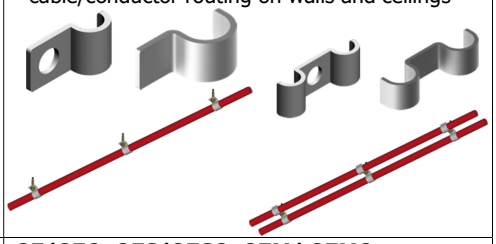
SD/SDO... + UK/UKO...
Rung + bracket
- rung spacing max. 600 mm
- cable/conductor routing vertical and horizontal
- cable routing on walls and ceilings

X1



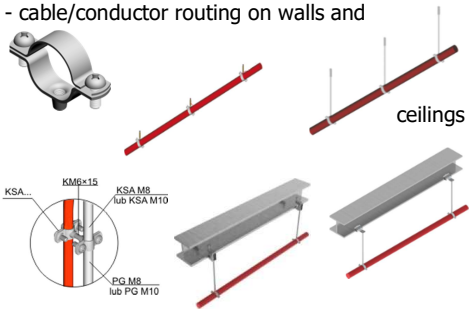
UDF..., UEF...
Cable clip
- bracket spacing max. 600 mm
- cable/conductor routing vertical and horizontal
- cable/conductor routing on walls and ceilings

X2



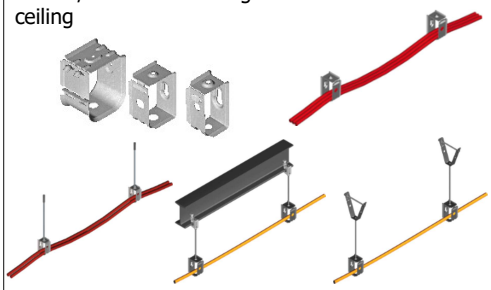
KSA...
Cable clamp
- clamps spacing max. 600 mm
- cable/conductor routing vertical and horizontal
- cable/conductor routing on walls and ceilings

X3



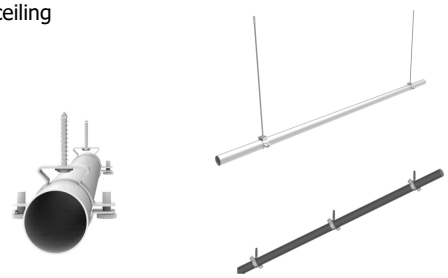
OZ/OZO, OZS/OZSO, OZM/ OZMO
Cable clamp
- clamps spacing max. 600 mm
- cable/conductor routing level
- cable/conductor routing on walls and ceiling

X4



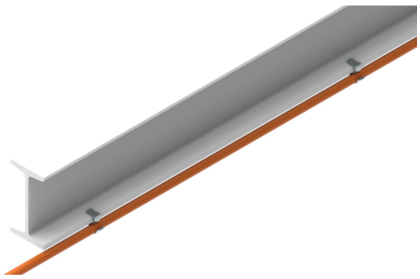
RU... + KSA/OBS
Thin-walled pipe
- Clamps spacing max. 1.5 m
- cable/conductor routing horizontal
- cable/conductor routing on walls and ceiling

X5



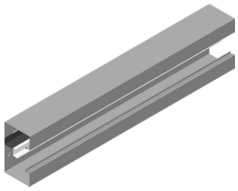
ZSK1
Clamp
- clamps spacing max. 600 mm
- cable/conductor routing, horizontal
- fixing to steel structure

X6



KS...H68
Wall trunking
- width 115 – 170 mm
- mounting every 0.8 m

Y

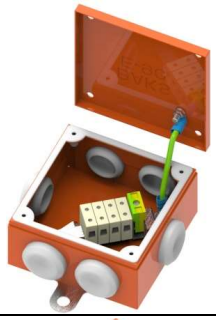


PMO1

Z1

PMO2

Z2

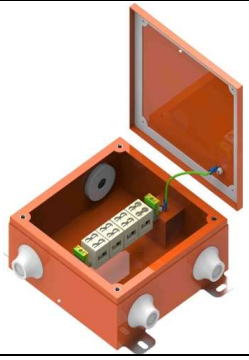


PMO2B

Z3

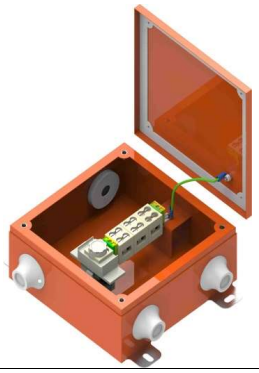
PMO3

Z4



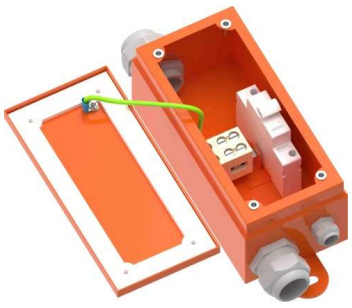
PMO3B

Z5



PMO4BE

Z6



CLASSIFICATION OF CABLE SYSTEMS ON SPECIAL CABLE SUPPORT STRUCTURES

Annex 2 Table 1. **Group C** cables classification - Special support structures - **KGL/KGOL, KCL/KCOL**

	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
BITNER	NHXH = NHXH-J			E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
	(N)HXH = (N)HXH-J			E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
	NHXCH			E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
	(N)HXCH			E60	E60	E60	E60	E60	E60									E60	E60	E60								E60	E60				E60	E60	E60	E60	E60	E60	E60			E60
	BiTflame 1000	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90		E90	E90
	BiTservo FS			E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30	E30	E30			E30
	HDGs	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90		E90	E90
	HDGsekwf	E90								E90	E90	E90	E90	E90	E90	E90	E90						E90	E90	E90	E90	E90					E90								E90	
	HTKSH	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90		E90	E90
	HTKSHekw	E90		E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			E60	E60	E60	E60	E60	E60	E60			E90	E60	E60	E60	E60	E60	E60	E60		E90	E60
	HLGs									E30	E30	E30	E30	E30	E30	E30	E30						E30	E30	E30	E30	E30															
	HLGs(żo)			E60	E60	E60	E60	E60	E60									E60	E60	E60								E60	E60				E60	E60	E60	E60	E60	E60	E60			E60
	BiTflame S			E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90				E90	E90	E90	E90	E90	E90	E90			E90

	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
DÄTWYLER	(N)HXH			E60	E60	E60	E60	E60	E60	E30	E30	E30	E30	E30	E30	E30	E30	E60	E60	E60								E60	E60				E60	E60	E60	E60	E60	E60	E60			E60
	(N)HXCH			E60	E60	E60	E60	E60	E60	E30	E30	E30	E30	E30	E30	E30	E30	E60	E60	E60								E60	E60				E60	E60	E60	E60	E60	E60	E60			E60

	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
ELKOND	JE-H(st)H									E90	E90	E90	E90	E90	E90	E90	E90						E90	E90	E90	E90	E90															
	1-CXKH-V (1.5-10mm²)			E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
	SHXKFH-V180			E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90	E90	E90			E90

	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
ELPAR	(N)HXH = (N)HXH-J									E60	E60	E60	E60	E60	E60	E60	E60						E60	E60	E60	E60	E60															
	NHXCH									E30	E30	E30	E30	E30	E30	E30	E30						E30	E30	E30	E30	E30															
	HDGs									E30	E30	E30	E30	E30	E30	E30	E30						E30	E30	E30	E30	E30															
	HTKSH									E30	E30	E30	E30	E30	E30	E30	E30						E30	E30	E30	E30	E30															

	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
EUPEN	(N)HXH = (N)HXH-J			E30	E30	E30	E30	E30	E30									E30	E30	E30								E30	E30				E30	E30	E30	E30	E30	E30	E30			E30
	(N)HXCH			E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
KABLOTEK	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
	NHXCH			E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
MADEX	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
	NHXH - NHXH-J			E60	E60	E60	E60	E60	E60									E60	E60	E60								E60	E60				E60	E60	E60	E60	E60	E60	E60			E60
	NHXCH			E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
NKT	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
	NHXH = NHXH-J			E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
PRAKAB	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
	(N)HXH			E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
	SSKFH-V180			E60	E60	E60	E60	E60	E60	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E60			E90	E90	E90	E90	E90	E60	E60				E60	E60	E60	E60	E60	E60	E60			E60
TECHNOKABEL	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
	NHXH = NHXH-J	E90		E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90	E90	E90	E90	E90	E90		E90	E90
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXCH									E90	E90	E90	E90	E90	E90	E90	E90				E90	E90								E90											
	JE-H(St)H		E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90		E90		E90	E90	E90	E90	E90	E90	E90	E90		E90
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs-W																				E90	E90								E90											
	HDGsekw	E30																														E30									E30	
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw			E90	E90	E90	E90	E90	E90									E90	E90	E90	E90	E90						E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90
TELEFONIKA	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	41	42	45	46	47	49	50	52	53	54	55	57
	(N)HXH = (N)HXH-J			E60	E60	E60	E60	E60	E60									E60	E60	E60	E90	E90						E60	E60				E60	E60	E60	E60	E60	E60	E60			E60
	(N)HXCH	E60		E90	E90	E90	E90	E90	E90									E90	E90	E90	E60	E60						E90	E90			E60	E90	E90	E90	E90	E90	E90	E90		E60	E90
	JE-H(St)H	E30		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90	E90						E90	E90			E30	E90	E90	E90	E90	E90	E90	E90		E30	E90
	HDGs			E90	E90	E90	E90	E90	E90									E90	E90	E90	E90	E90						E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
	HTKSH			E90	E90	E90	E90	E90	E90									E90	E90	E90	E90	E90						E90	E90				E90	E90	E90	E90	E90	E90	E90			E90
	HTKSHekw			E60	E60	E60	E60	E60	E60									E60	E60	E60	E90	E90						E60	E60				E60	E60	E60	E60	E60	E60	E60			E60

Annex 2 Table 2. **Group D** cable classification - Special support structures - **CWP/CWOP40H40**

	Cable type	3	43	56
BITNER	HDGs	E90	E90	E90
	HDGsekwf	E90	E90	E90
	HTKSH	E90	E90	E90
	HTKSHekw	E90	E90	E90
TECHNOKABEL	**Cable type**	**3**	**43**	**56**
	HDGs	E90	E90	E90
	HTKSH	E90	E90	E90
	HTKSHekw	E60	E60	E60
TELEFONIKA	**Cable type**	**3**	**43**	**56**
	JE-H(St)H	E90	E90	E90

Annex 2 Table 3. **Group E** cable classification - Special support structures - **KFL**

	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	41	42	45	46	47	49	51	52	53	54	55	57
BITNER	(N)HXH = (N)HXH-J		E90							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30			E90									E90		
	BiTflame 1000		E90							E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90			E90									E90		
	HDGs		E90							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30			E90									E90		
	HTKSH		E90							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30			E90									E90		
DÄTWYLER	**Cable type**	**1**	**2**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**41**	**42**	**45**	**46**	**47**	**49**	**51**	**52**	**53**	**54**	**55**	**57**
	(N)HXH		E60	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E60		E30	E30	E30	E30	E30	E30	E30	E60		E30
	(N)HXCH									E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90														
	JE-H(St)H									E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30														
ELKOND	**Cable type**	**1**	**2**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**41**	**42**	**45**	**46**	**47**	**49**	**51**	**52**	**53**	**54**	**55**	**57**
	1-CXKH-V (1.5-10mm²)	E90																											E90									E90	

	SHXKFH-V180	E90																											E90									E90		
LEONI STUDER	**Cable type**	**1**	**2**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**41**	**42**	**45**	**46**	**47**	**49**	**51**	**52**	**53**	**54**	**55**	**57**			
	(N)HXH = (N)HXH-J									E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																		
	(N)HXCH									E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																		
	(N)HXCH E30									E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																		
	JE-H(St)H									E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																		
	JE-H(St)HRH									E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																		
TECHNOKABEL	**Cable type**	**1**	**2**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**41**	**42**	**45**	**46**	**47**	**49**	**51**	**52**	**53**	**54**	**55**	**57**			
	NHXH = NHXH-J		E90							E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90			E90										E90					
	(N)HXH = (N)HXH-J	E90								E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90				E90										E90				
	NHXCH	E90																											E90									E90				
	(N)HXCH-J SERVO									E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90																		
	HDGs		E90							E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90			E90										E90					
	HDGs-W									E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90																		
	HDGsżo-W									E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90																		
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSHekw	E90								E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90				E90										E90				

	Cable type	1	2	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	41	42	45	46	47	49	51	52	53	54	55	57
TELEFONIKA	NHXH = NHXH-J									E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90													
	(N)HXH = (N)HXH-J			E60	E60	E60	E60	E60	E60	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E60	E90	E90	E90	E90	E90	E60	E60			E60	E60	E60	E60	E60	E60	E60			E60
	(N)HXCH		E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60		E60	E60	E60	E60	E60	E60	E60		E60
	JE-H(St)H			E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90
	HDGs		E90							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30			E90									E90		
	HTKSH		E30							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30			E30									E30		

Annex 2 Table 4. **Group F** cable classification - Special support structures - **KBL**

	Cable type	4	5	6	7	9	10	23	24	25	26	27	38	39	40	45	46	47	49	50	52	53	57
BITNER	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90		E90	E90	E90	E90	E90	E90	E90	E90
	BiTflame 1000	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	Cable type	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**26**	**27**	**38**	**39**	**40**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
TECHNOKABEL	NHXH = NHXH-J	E30	E30	E30	E30	E30	E30	E30	E30	E30			E30	E30		E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E90	E90	E60	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E90	E90	E60	E90	E90	E90	E90	E90	E90	E90	E90
	Cable type	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**26**	**27**	**38**	**39**	**40**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
TELEFONIKA	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E30	E30	E90	E90	E30	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXCH	E30	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E30	E30	E90	E30	E30	E30	E30	E30	E30	E30	E30
	JE-H(St)H	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	HDGs	E30	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E30	E30	E90	E30	E30	E30	E30	E30	E30	E30	E30
	HTKSH	E30	E30	E30	E30	E30	E30	E30	E30	E30	E60	E60	E30	E30	E60	E30	E30	E30	E30	E30	E30	E30	E30
	HTKSHekw	E30	E30	E30	E30	E30	E30	E30	E30	E30	E60	E60	E30	E30	E60	E30	E30	E30	E30	E30	E30	E30	E30

Annex 2 Table 5. **Group G** cable classification - Special support structures - **KGJ/KGOJ, KCJ/KCOJ**

	Cable type	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57	59	60	61
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	NHXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXCH	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	BiTflame 1000	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	BiTflame 1000 C	E60	E60	E60	E60	E60	E60	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E60	E90	E90	E90	E90	E90	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	BiTservo FS	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	BiTservo FS mika	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
	HDGs	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
	HDGsekwf	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSHekw	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSHekwf	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HLGs(żo)	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	BiTflame AS	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	BiTflame AS(St)	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	BiTflame S	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
DÄTWYLER	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	(N)HXH	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXCH	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	JE-H(St)H	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
ELKOND	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	1-CXKH-V (1.5-10mm²)	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	SHXKFH-V180	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
ELPAR	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	NHXCH	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HDGs	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			

	HTKSH	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
EUPEN	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	JE-H(st)H	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
CABLOT	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	JE-H(St)H	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	LINCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
MADEX	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	NHXH - NHXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSH	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
	HTKSHekw	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
NKT	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
PRAKAB	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	PRAFlaDur 1-CCXKH-V180	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
	(N)HXH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	SSKFH-V180	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
LEONI STUDER	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	JE-H(St)H	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	JE-H(St)HRH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
TECHNOKABEL	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXHX	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXCH-J SERVO	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	NHXHRHX = NHXHRHX-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			

	JE-H(St)H	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HDGs-W	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGszo	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HDGszo-W	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	HTKSH	E90	E90	E90	E90	E90	E90	E60	E60	E60	E60	E60	E60	E60	E60	E90	E90	E90	E60	E60	E60	E60	E60	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	Cable type	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
TELEFONIKA	NHXH = NHXH-J	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90
	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E90	E90	E90
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	HLGsekwf	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			

Annex 2 Table 6. **Group H** cable classification - Special support structures - **KFJ...**

	Cable type	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	BiTflame 1000	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	BiTservo FS	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HLGs(żo)	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
DÄTWYLER	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	(N)HXH	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXCH	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
LEONI STUDER	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	(N)HXCH							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30										
	(N)HXCH E30							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30										
TECHNOKABEL	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	NHXH = NHXH-J	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXCH	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXCH-J SERVO	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
TELEFONIKA	**Cable type**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90

Annex 2 Table 7. **Group I** cable classification - Special support structures - **KBJ...**

	Cable type	4	5	6	7	9	10	23	24	25	38	39	45	46	47	49	50	52	53	57	59	60	61
BITNER	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	Cable type	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
TECHNOKABEL	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E30	E30	E30
	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	(N)HXH E30 = (N)HXH-J E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXCH-J SERVO	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	HDGs	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90
	HDGszo-W	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
	HTKSH	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HLGsekwżo	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			
	Cable type	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**
TELEFONIKA	NHXH = NHXH-J	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	(N)HXH = (N)HXH-J	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXCH	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60			
	JE-H(St)H	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E30	E30	E30
	HDGs	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E30	E30	E30
	HTKSH	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30			

Annex 2 Table 8. **Group J** cable classification - Special support structures - **KCD/KCOD**..

	Cable type	4	5	6	7	9	10	23	24	25	38	39	45	46	47	49	50	52	53	57
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXCH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	Cable type	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
ELKOND	NHXH = NHXH-J (1.5-10mm²)	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	N2XH P30	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	N2XH P60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	JE-H(st)H	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	Cable type	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
TECHNOKABEL	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXCH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXCH E30	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGsekwżo	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90

Annex 2 Table 9. **Group K** cable classification - Special support structures - **KCP/KCOP**..

	Cable type	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	23	24	25	26	27	28	29	30	31	32	38	39	40	44	45	46	47	48	49	50	52	53	57
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	NHXCH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	BiTflame 1000	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	BiTflame 1000 C	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	BiTservo FS	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90			E30	E30	E30	E30	E30	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HDGsekwf	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HLGsekwf	E30	E30	E30	E30	E30	E30	E30									E30	E30	E30								E30	E30			E30	E30	E30		E30	E30	E30	E30	E30
DÄTWYLER	**Cable type**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**40**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**52**	**53**	**57**
	(N)HXH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	JE-H(St)HRH	E30	E30	E30	E30	E30	E30	E30									E30	E30	E30								E30	E30			E30	E30	E30		E30	E30	E30	E30	E30
EUPEN	**Cable type**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**40**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**52**	**53**	**57**
	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60	E60									E60	E60	E60								E60	E60			E60	E60	E60		E60	E60	E60	E60	E60
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	JE-H(st)H	E60	E60	E60	E60	E60	E60	E60									E60	E60	E60								E60	E60			E60	E60	E60		E60	E60	E60	E60	E60
CABLOT	**Cable type**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**40**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**52**	**53**	**57**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
MADEX	**Typ kabla**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**40**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**52**	**53**	**57**
	NHXH - NHXH-J	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	NHXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90

	HTKSH	E30	E30	E30	E30	E30	E30	E30									E30	E30	E30								E30	E30			E30	E30	E30		E30	E30	E30	E30	E30
	HTKSHekw	E30	E30	E30	E30	E30	E30	E30									E30	E30	E30								E30	E30			E30	E30	E30		E30	E30	E30	E30	E30
TECHNOKABEL	**Typ kabla**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**40**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**52**	**53**	**57**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90			E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXH E30 = NHXH-J E30	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90		E60	E90	E90	E90	E60	E90	E90	E90	E90	E90
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	(N)HXHX	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	NHXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	NHXCH E30	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90	E90						E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90
	(N)HXCH-J SERVO	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E60	E60						E90	E90	E60		E90	E90	E90		E90	E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90			E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E30	E30	E90	E90	E90	E90	E90	E90	E90	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs-W	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HDGsżo-W	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90			E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E30	E30	E90	E90	E90	E90	E90	E90	E90	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HLGs	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
TELEFONIKA	**Typ kabla**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**40**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**52**	**53**	**57**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90	E90						E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90
	NHXCH																			E90	E90								E90										
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	N2XH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90	E90						E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90								E90	E90			E90	E90	E90		E90	E90	E90	E90	E90

Annex 2 Table 10. **Group L** cable classification - Special support structures - **DUD**...

	Typ kabla	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	(N)HXH = (N)HXH-J							E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90														E90	E90	E90	E90
	NHXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	(N)HXCH	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60							
	BiTflame 1000	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	BiTflame 1000 C	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	BiTservo FS	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90
	HDGsekwf	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90				E60	E60	E60	E60
	HTKSHekwf	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	HLGs(żo)	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30							

	Typ kabla	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
DÄTWYLER	(N)HXH							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																	
	(N)HXCH							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																	
	JE-H(St)H							E30	E30	E30	E30	E30	E30	E30	E30				E30	E30	E30	E30	E30																	

	Typ kabla	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
ELPAR	NHXH = NHXH-J	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30							
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	NHXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	HDGs	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30							
	HTKSH	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30							

	Typ kabla	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
TECHNOKABEL	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	NHXHX	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXH E30 = (N)HXH-J E30	E30	E30	E30	E30	E30	E30	E60	E60	E60	E60	E60	E60	E60	E60	E30	E30	E30	E60	E60	E60	E60		E30	E30	E30	E30	E30	E30	E30	E30	E30	E30							
	NHXCH	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30				E60	E60	E60	E60

	NHXCHX	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90								
	(N)HXCH	E60	E60	E60	E60	E60	E60	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E60	E90	E90	E90	E90		E60	E60	E60	E60	E60	E60	E60	E60	E60	E60								
	(N)HXCH-J SERVO	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30								
	HDGs	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30								
	HDGs-W																															E90	E90	E90							
	HTKSH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90					
TELEFONIKA	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**	**62**	**63**	**64**	**65**
	NHXH = NHXH-J																																	E90	E90	E90				
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXCH	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90				
	HDGs	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90				
	HTKSH	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60								
	HLGsekwf	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30								

Annex 2 Table 11. **Group M** cable classification - Special support structures - **DGOD**...

	Typ kabla	4	5	6	7	9	10	23	24	25	26	27	38	39	40	45	46	47	49	50	52	53	57
BITNER	NHXH = NHXH-J	E30	E30	E30	E30	E30	E30	E30	E30	E30			E30	E30		E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXH = (N)HXH-J										E90	E90			E90								
	NHXCH	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90		E90	E90	E90	E90	E90	E90	E90	E90
	BiTflame 1000										E90	E90			E90								
	HDGs										E90	E90			E90								
	HTKSH										E90	E90			E90								
	Typ kabla	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**26**	**27**	**38**	**39**	**40**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
TECHNOKABEL	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXH = (N)HXH-J										E90	E90			E90								
	NHXCH										E90	E90			E90								
	(N)HXCH-J SERVO										E90	E90			E90								
	JE-H(St)H	E60	E60	E60	E60	E60	E60	E60	E60	E60	E90	E90	E60	E60	E90	E60	E60	E60	E60	E60	E60	E60	E60
	HDGs										E30	E30			E30								
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	Typ kabla	**4**	**5**	**6**	**7**	**9**	**10**	**23**	**24**	**25**	**26**	**27**	**38**	**39**	**40**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
TELEFONIKA	NHXH = NHXH-J										E90	E90			E90								
	(N)HXH = (N)HXH-J										E90	E90			E90								
	(N)HXCH										E60	E60			E60								
	HDGs										E90	E90			E90								
	HTKSH										E90	E90			E90								
	HTKSHekw										E90	E90			E90								

Annex 2 Table 12. **Group N** cable classification - Special support structures - **DUP/DUOP...**

	Typ kabla	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	22	23	24	25	28	29	30	31	32	33	34	35	38	39	44	45	46	47	48	49	50	52	53	57	59	60	61	62	63	64	65
BITNER	NHXH = NHXH-J	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90		E30	E30	E30	E90	E90	E90	E90	E90				E30	E30		E30	E30	E30		E30	E30	E30	E30	E30							
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E60	E60	E60	E60	E60	E60	E60	E60	E30	E90	E90	E90	E60	E60	E60	E60	E60			E30	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30
	NHXCH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90				E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90									E30	E90	E90	E90								E30	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30
	BiTflame 1000	E90	E90	E90	E90	E90	E90	E90	E60	E60	E60	E60	E60	E60	E60	E60	E60	E90	E90	E90	E60	E60	E60	E60	E60			E60	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E60	E60	E60				
	BiTflame 1000 C	E30	E30	E30	E30	E30	E30	E30	E60	E60	E60	E60	E60	E60	E60	E60	E60	E30	E30	E30	E60	E60	E60	E60	E60			E60	E30	E30		E30	E30	E30		E30	E30	E30	E30	E30	E90	E90	E90				
	BiTflame FS	E30	E30	E30	E30	E30	E30	E30										E30	E30	E30									E30	E30		E30	E30	E30		E30	E30	E30	E30	E30							
	BiTservo FS	E30	E30	E30	E30	E30	E30	E30										E30	E30	E30									E30	E30		E30	E30	E30		E30	E30	E30	E30	E30							
	JE-H(St)H								E30	E30	E30	E30	E30	E30	E30	E30					E30	E30	E30	E30	E30																					
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E30	E90	E90	E90	E90	E90	E90	E90	E90			E30	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E60	E60	E60	E30	E30	E30	E30
	HDGsekwf	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E30	E30	E30	E90	E90	E90	E90	E90			E90	E30	E30		E30	E30	E30		E30	E30	E30	E30	E30	E90	E90	E90				
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90				
	HLGs								E60	E60	E60	E60	E60	E60	E60	E60	E30				E60	E60	E60	E60	E60			E30													E30	E30	E30	E30	E30	E30	E30

	Typ kabla	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	22	23	24	25	28	29	30	31	32	33	34	35	38	39	44	45	46	47	48	49	50	52	53	57	59	60	61	62	63	64	65
ELPAR	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60	E60										E60	E60	E60									E60	E60		E60	E60	E60		E60	E60	E60	E60	E60							
	NHXCH	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	HDGs	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	HTKSH	E30	E30	E30	E30	E30	E30	E30										E30	E30	E30									E30	E30		E30	E30	E30		E30	E30	E30	E30	E30							

	Typ kabla	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	22	23	24	25	28	29	30	31	32	33	34	35	38	39	44	45	46	47	48	49	50	52	53	57	59	60	61	62	63	64	65
LEONI STUDER	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60	E60										E60	E60	E60									E60	E60		E60	E60	E60		E60	E60	E60	E60	E60							
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	JE-H(St)H	E30	E30	E30	E30	E30	E30	E30										E30	E30	E30									E30	E30		E30	E30	E30		E30	E30	E30	E30	E30							
	JE-H(St)HRH	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							

	Typ kabla	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	22	23	24	25	28	29	30	31	32	33	34	35	38	39	44	45	46	47	48	49	50	52	53	57	59	60	61	62	63	64	65
TECHNOK ABEL	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90

	NHXH E30 = NHXH-J E30	E30	E30	E30	E30	E30	E30	E30										E30	E30	E30									E30	E30		E30	E30	E30		E30	E30	E30	E30	E30							
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E60	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E60	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E30	E30	E30	E90	E90	E90	E90
	(N)HXH E30 = (N)HXH-J E30	E30	E30	E30	E30	E30	E30	E30										E30	E30	E30									E30	E30		E30	E30	E30		E30	E30	E30	E30	E30							
	NHXCH	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90								E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90				
	NHXCH E30	E60	E60	E60	E60	E60	E60	E60										E60	E60	E60									E60	E60		E60	E60	E60		E60	E60	E60	E60	E60							
	(N)HXCH																E90											E90																			
	(N)HXCH-J SERVO	E60	E60	E60	E60	E60	E60	E60										E60	E60	E60									E60	E60		E60	E60	E60		E60	E60	E60	E60	E60							
	NHXHRHX = NHXHRHX-J	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	HDGs	E90	E90	E90	E90	E90	E90	E90									E60	E90	E90	E90							E90	E60	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E30	E30	E30	E90	E90	E90	E90
	HDGsżo																																											E90	E90	E90	E90
	HDGsżo-W	E60	E60	E60	E60	E60	E60	E60										E60	E60	E60									E60	E60		E60	E60	E60		E60	E60	E60	E60	E60							
	HDGsekw																E30											E30																			
	HTKSH	E90	E90	E90	E90	E90	E90	E90								E30	E90	E90	E90	E90						E90	E60	E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90								E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90				
	HTKGs E30																																								E30	E30	E30				
TELEFONIKA	**Typ kabla**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**22**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**38**	**39**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**	**62**	**63**	**64**	**65**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90										E90	E90	E90									E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90									E30	E90	E90	E90								E30	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	(N)HXCH	E90	E90	E90	E90	E90	E90	E90									E60	E90	E90	E90								E60	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90								E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	HDGs	E90	E90	E90	E90	E90	E90	E90									E30	E90	E90	E90								E30	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	HTKSH	E90	E90	E90	E90	E90	E90	E90									E60	E90	E90	E90								E60	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90							
	HLGsekwf																E30											E30																			

Annex 2 Table 13. **Group O** cable classification - Special support structures - **DGOP**...

	Typ kabla	4	5	6	7	9	10	22	23	24	25	26	27	28	29	30	31	32	35	38	39	40	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	NHXCH	E30	E30	E30	E30	E30	E30		E30	E30	E30									E30	E30		E30	E30	E30	E30	E30	E30	E30	E30							
	BiTflame 1000	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	BiTflame 1000 C	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	JE-H(St)H	E60	E60	E60	E60	E60	E60		E60	E60	E60									E60	E60		E60	E60	E60	E60	E60	E60	E60	E60							
	HDGs	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	HDGsekwf	E30	E30	E30	E30	E30	E30		E30	E30	E30									E30	E30		E30	E30	E30	E30	E30	E30	E30	E30							
	HTKSHekw	E60	E60	E60	E60	E60	E60		E60	E60	E60									E60	E60		E60	E60	E60	E60	E60	E60	E60	E60							

	Typ kabla	4	5	6	7	9	10	22	23	24	25	26	27	28	29	30	31	32	35	38	39	40	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
DÄTWYLER	(N)HXH	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	JE-H(St)H	E60	E60	E60	E60	E60	E60		E60	E60	E60									E60	E60		E60	E60	E60	E60	E60	E60	E60	E60							
	JE-H(St)HRH	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							

	Typ kabla	4	5	6	7	9	10	22	23	24	25	26	27	28	29	30	31	32	35	38	39	40	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
ELKOND	NHXH = NHXH-J (1.5-10mm²)	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	N2XH P30	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	N2XH P60	E60	E60	E60	E60	E60	E60		E60	E60	E60									E60	E60		E60	E60	E60	E60	E60	E60	E60	E60							
	JE-H(st)H P30	E30	E30	E30	E30	E30	E30		E30	E30	E30									E30	E30		E30	E30	E30	E30	E30	E30	E30	E30							
	JE-H(st)H P90	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	1-CXKH-V (1.5-10mm²)	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							

	Typ kabla	4	5	6	7	9	10	22	23	24	25	26	27	28	29	30	31	32	35	38	39	40	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
EUPEN	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	(N)HXCH	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	JE-H(st)H	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							

	Typ kabla	4	5	6	7	9	10	22	23	24	25	26	27	28	29	30	31	32	35	38	39	40	45	46	47	49	50	52	53	57	59	60	61	62	63	64	65
TECHNOKABEL	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	NHXH E30 = NHXH-J E30	E60	E60	E60	E60	E60	E60		E60	E60	E60									E60	E60		E60	E60	E60	E60	E60	E60	E60	E60							
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E30	E30	E30	E30	E30		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90							
	(N)HXHX	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90							
	NHXCH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90

	NHXCH E30	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90											
	(N)HXCH	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90											
	JE-H(St)H	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90											
	HDGs	E90	E90	E90	E90	E90	E90		E90	E90	E90			E90	E90	E90	E90	E90		E90	E90		E90	E90	E90	E90	E90	E90	E90	E90											
	HDGs-W	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90							E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90											
	HDGszo							E90											E90																							
	HDGsekwżo																																					E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90											
	HTKSHekw	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90
	HLGs	E30	E30	E30	E30	E30	E30		E30	E30	E30									E30	E30		E30	E30	E30	E30	E30	E30	E30	E30											
TELEFONIKA	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**35**	**38**	**39**	**40**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**	**59**	**60**	**61**	**62**	**63**	**64**	**65**				
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90								
	(N)HXCH	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90								
	N2XH	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90											
	JE-H(St)H	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90								
	HDGs	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90											
	HTKSH	E90	E90	E90	E90	E90	E90		E90	E90	E90									E90	E90		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90								

Annex 2 Table 14. **Group P** cable classification - Special support structures - **DFP...**

	Typ kabla	4	5	6	7	9	10	11	12	13	14	15	16	17	18	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57
BITNER	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60	E90	E90	E90	E90	E90	E90	E90	E90	E60	E60	E60	E90	E90	E90	E90	E90	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	BiTservo FS	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
DÄTWYLER	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	(N)HXCH	E90	E90	E90	E90	E90	E90									E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
TECHNOKABEL	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	NHXH = NHXH-J							E60	E60	E60	E60	E60	E60	E60	E60				E60	E60	E60	E60	E60										
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXH E30 = (N)HXH-J E30	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXCH	E60	E60	E60	E60	E60	E60									E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	(N)HXCH-J SERVO	E30	E30	E30	E30	E30	E30	E60	E60	E60	E60	E60	E60	E60	E60	E30	E30	E30	E60	E60	E60	E60	E60	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	HDGs							E90	E90	E90	E90	E90	E90	E90	E90				E90	E90	E90	E90	E90										
	HDGszo-W	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
TELEFONIKA	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	(N)HXH = (N)HXH-J	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXCH	E30	E30	E30	E30	E30	E30									E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	JE-H(St)H	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30

Annex 2 Table 15. **Group R** cable classification - Special support structures - **KDS/KDSO60H60, KSG60H60**

	Typ kabla	4	5	6	7	9	10	19	23	24	25	36	38	39	45	46	47	49	50	51	52	53	57	58	67
BITNER	(N)HXCH																								E90
	JE-H(St)H							E90				E90								E90				E90	
	HDGs							E90												E90				E90	E90
	HDGsekwf							E30												E30				E30	
	HTKSH							E90												E90				E90	E90
	HTKSHekw							E90				E30								E90				E90	
	BiTflame AS(St)							E90												E90				E90	
DÄTWYLER	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**19**	**23**	**24**	**25**	**36**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**51**	**52**	**53**	**57**	**58**	**67**
	JE-H(St)H							E60												E60				E60	
	JE-H(St)HRH							E60												E60				E60	
ELKOND	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**19**	**23**	**24**	**25**	**36**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**51**	**52**	**53**	**57**	**58**	**67**
	NHXH = NHXH-J (1,5-10mm²)							E90				E90								E90				E90	
	N2XH P30							E90				E90								E90				E90	
	JE-H(st)H P30							E60				E30								E60				E60	
	JE-H(st)H P90							E90				E90								E90				E90	
MADEX	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**19**	**23**	**24**	**25**	**36**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**51**	**52**	**53**	**57**	**58**	**67**
	HTKSH							E60												E60				E60	
	HTKSHekw							E30												E30				E30	
TECHNOKABEL	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**19**	**23**	**24**	**25**	**36**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**51**	**52**	**53**	**57**	**58**	**67**
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90	E90	E90		E90
	JE-H(St)H							E60												E60				E60	
	HDGs																								E90
	HDGsżo-W	E60	E60	E60	E60	E60	E60		E60	E60	E60		E60	E60	E60	E60	E60	E60	E60		E60	E60	E60		
	HTKSH							E60				E60								E60				E60	E90
	HTKSHekw							E60												E60				E60	
	HTKSHekw E30																								E90
TELEFONIKA	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**19**	**23**	**24**	**25**	**36**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**51**	**52**	**53**	**57**	**58**	**67**
	HTKSH	E90	E90	E90	E90	E90	E90		E90	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90	E90	E90		

Annex 2 Table 16. **Group S** cable classification - Special support structures - **KGS..**

	Cable type	20
TECHNOKABEL	NHXH = NHXH-J	E90
	(N)HXH = (N)HXH-J	E30
	HDGs	E90
	HTKSH	E90
	HTKSHekw	E90

Annex 2 Table 17. **Group T** cable classification - Special support structures - **KDS/KDSO ...H60, KSG...H60**

	Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
BITNER	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	(N)HXH = (N)HXH-J		E90	E90	E90	E90	E90	E90	E60	E60	E60	E60	E60	E60	E60	E60	E90	E90	E90	E90	E60	E60	E60	E60	E60	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	NHXCH		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	(N)HXCH		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	BiTflame 1000	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	BiTflame 1000 C		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	JE-H(St)H		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	HDGs	E90	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HDGsekwf	E90	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HTKSHekw		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	HTKSHekwf	E90																										E90							E90					
	HLGs	E90																										E90							E90					
	HLGsekwf	E90																										E90							E90					
	BiTflame AS(St)		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	Typ kabla	**1**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**21**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**42**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**55**	**57**	**59**	**60**	**61**
DÄTWYLER	(N)HXH		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	(N)HXCH		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	JE-H(St)H		E60	E60	E60	E60	E60	E60	E30	E30	E30	E30	E30	E30	E30	E30	E60	E60	E60	E60	E30	E30	E30	E30	E30	E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
	JE-H(St)HRH		E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			

ELKOND

Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
NHXH = NHXH-J (1.5-10mm²)		E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
N2XH P30		E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
N2XH P60		E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
JE-H(st)H P30		E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			
JE-H(st)H P90		E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			
1-CXKH-V (1.5-10mm²)	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
SHXKFH-V180	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			

ELPAR

Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
NHXH = NHXH-J		E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			
(N)HXH = (N)HXH-J		E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
NHXCH		E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
(N)HXCH		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
HDGs		E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			
HTKSH		E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			

CABLOT

Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
NHXH = NHXH-J		E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
NHXCH		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			

MADEX

Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
NHXH - NHXH-J		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
NHXCH		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
HTKSH		E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			

NKT

Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
NHXH = NHXH-J		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			

PRAKAB

Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
(N)HXH		E30	E30	E30	E30	E30	E30	E60	E60	E60	E60	E60	E60	E60	E60	E30	E30	E30	E30	E60	E60	E60	E60	E60	E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			
SSKFH-V180		E60	E60	E60	E60	E60	E60	E30	E30	E30	E30	E30	E30	E30	E30	E60	E60	E60	E60	E30	E30	E30	E30	E30	E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			

TECHNOKABEL

Typ kabla	1	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	42	45	46	47	49	50	52	53	55	57	59	60	61
NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
NHXH E30 = NHXH-J E30		E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30		E30	E30	E30	E30	E30	E30	E30		E30			
NHXHX		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			

	(N)HXH = (N)HXH-J		E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90	E30	E30	E30
	NHXCH		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	(N)HXCH		E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	(N)HXCH-J SERVO		E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60		E60	E60	E60	E60	E60	E60	E60		E60			
	HDGs	E90	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90			
	HDGs-W																																					E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
TELEFONIKA	**Typ kabla**	**1**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**21**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**42**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**55**	**57**	**59**	**60**	**61**
	NHXH = NHXH-J		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90	E60	E60	E60
	NHXCH		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90			
	(N)HXH = (N)HXH-J		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90	E90	E90	E90
	(N)HXCH	E60	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E60	E90	E90	E90	E90	E90	E90	E90	E60	E90	E90	E90	E90
	JE-H(St)H	E60	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E60	E90	E90	E90	E90	E90	E90	E90	E60	E90	E90	E90	E90
	HDGs	E60	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E60	E90	E90	E90	E90	E90	E90	E90	E60	E90	E90	E90	E90
	HTKSH		E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90		E90	E90	E90	E90	E90	E90	E90		E90	E60	E60	E60

Annex 2 Table 18. **Group U** cable classification - Special support structures - **KDSZ60H60**

	Typ kabla	19	51	58
BITNER	(N)HXH = (N)HXH-J	E90	E90	E90
	BiTflame 1000	E90	E90	E90
	HDGs	E90	E90	E90
	HTKSH	E90	E90	E90
TECHNOKABEL	**Typ kabla**	**19**	**51**	**58**
	NHXH = NHXH-J	E90	E90	E90
	HDGs-W	E90	E90	E90
	HTKSH	E90	E90	E90
TELEFONIKA	**Typ kabla**	**19**	**51**	**58**
	(N)HXCH	E60	E60	E60
	HDGs	E90	E90	E90
	HTKSH	E30	E30	E30

Annex 2 Table 19. **Group W** cable classification - Special support structures - **KDSZ...H60**

	Typ kabla	4	5	6	7	9	10	11	12	13	14	15	16	17	18	21	23	24	25	28	29	30	31	32	38	39	45	46	47	49	50	52	53	57
BITNER	BiTflame 1000 C	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	BiTservo FS	E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	HLGs(żo)	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
DÄTWYLER	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**21**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	(N)HXH	E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXCH	E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
TECHNOKABEL	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**21**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	(N)HXCH	E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	(N)HXCH-J SERVO	E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30
	JE-H(St)H							E90	E90	E90	E90	E90	E90	E90	E90					E90	E90	E90	E90	E90										
	HDGs	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGsżo-W	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw							E90	E90	E90	E90	E90	E90	E90	E90					E90	E90	E90	E90	E90										
TELEFONIKA	**Typ kabla**	**4**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**21**	**23**	**24**	**25**	**28**	**29**	**30**	**31**	**32**	**38**	**39**	**45**	**46**	**47**	**49**	**50**	**52**	**53**	**57**
	(N)HXH = (N)HXH-J	E60	E60	E60	E60	E60	E60									E60	E60	E60	E60						E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	(N)HXCH	E60	E60	E60	E60	E60	E60	E30	E30	E30	E30	E30	E30	E30	E30	E60	E60	E60	E60	E30	E30	E30	E30	E30	E60	E60	E60	E60	E60	E60	E60	E60	E60	E60
	JE-H(St)H	E90	E90	E90	E90	E90	E90	E30	E30	E30	E30	E30	E30	E30	E30	E90	E90	E90	E90	E30	E30	E30	E30	E30	E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HDGs	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSH	E90	E90	E90	E90	E90	E90									E90	E90	E90	E90						E90	E90	E90	E90	E90	E90	E90	E90	E90	E90
	HTKSHekw	E30	E30	E30	E30	E30	E30									E30	E30	E30	E30						E30	E30	E30	E30	E30	E30	E30	E30	E30	E30

Annex 2 Table 20. **Group X** cable classification - Special fixture for **cable clamps and brackets**

	Typ kabla	X1	X2	X3	X4	X5	X6
BITNER	NHXH = NHXH-J	E90	E90	E90	E90		
	(N)HXH = (N)HXH-J		E90			E60	
	NHXCH	E90	E90	E90	E90		
	(N)HXCH		E90				
	BiTflame 1000	E90	E90				
	BiTflame 1000 C	E90	E90				
	BiTservo FS	E90	E60				
	JE-H(St)H	E90	E90	E90	E90		
	HDGs	E90	E90		E90	E30	
	HDGsekwf		E90		E30		
	HTKSH		E90		E90		
	HTKSHekw	E90	E90		E90		
	HTKSHekwf		E90				
	HLGs		E90			E60	
	HLGsekwf		E90				
	Securi Flame F		E90				
	BiTflame AS				E90		
DÄTWYLER	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	(N)HXH	E60	E60	E30	E90	E60	
	(N)HXCH	E60		E90	E90	E60	
	JE-H(St)H	E30		E30			
ELKOND	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	NHXH = NHXH-J (1,5-10mm²)		E90				
	N2XH P30		E60				
	N2XH P60		E60				
	JE-H(st)H P30		E30				
	JE-H(st)H P90		E90				
	1-CXKH-V (1.5-10mm²)		E90		E90		

	SHXKFH-V180		E90		E90		
ELPAR	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	NHXH = NHXH-J	E90	E60				
	(N)HXH = (N)HXH-J	E60	E90				
	NHXCH	E90	E90				
	(N)HXCH	E30	E90				
	HDGs	E60	E90				
	HTKSH	E90	E60				
EUPEN	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	(N)HXH = (N)HXH-J	E90					
	(N)HXCH	E90					
	JE-H(st)H	E90					
KABLOTEK	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	NHXH = NHXH-J	E90		E90			
	NHXCH	E90		E90			
	JE-H(St)H	E90		E90			
MADEX	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	NHXH - NHXH-J	E60	E90				
	NHXCH		E90				
	HTKSH	E90	E90				
	HTKSHekw		E90				
NKT	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	NHXH = NHXH-J	E90	E90	E90	E90		
PRAKAB	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	PRAFlaDur 1-CSKH-V180			E90	E90		
	(N)HXH		E90		E30		
	SSKFH-V180		E90		E90		
TECHNI STUDE	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**

	(N)HXCH				E90		
	(N)HXCH E30				E60		
	JE-H(St)H				E60		
	JE-H(St)HRH				E30		
TECHNOKABEL	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
	NHXH = NHXH-J	E90	E90	E90	E90	E90	
	NHXH E30 = NHXH-J E30	E90			E90		
	(N)HXH = (N)HXH-J	E90	E90	E90	E90	E90	E90
	(N)HXH E30 = (N)HXH-J E30	E60					
	NHXCH	E90	E90		E90	E90	
	NHXCH E30	E90			E60		
	(N)HXCH	E90	E90			E90	
	(N)HXCH-J SERVO		E90	E90	E60		
	(N)HXCH-J SERVO-W				E90		
	NHXHRHX = NHXHRHX-J		E90				
	JE-H(St)H	E90	E90		E90		
	HDGs		E90	E90	E90	E90	E90
	HDGs-W		E90				
	HDGszo	E90	E90	E90			
	HDGszo-W		E90		E90		
	HDGsekwżo	E90	E90				
	HTKSH	E90	E90	E90	E90	E90	E90
	HTKSH E60	E60	E90		E90		
	HTKSHekw		E90	E90	E90	E90	
	HTKSHekw E30	E30	E60		E60		
	HTKSHekw E60	E60	E60		E60		
	HTKGs E30				E90		
	HLGs	E90	E90				
	HLGszo		E90				
	HLGsekw	E90	E90		E90		
TELEFONIKA	**Typ kabla**	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**

	NHXH = NHXH-J	E90	E90				
	NHXCH	E90	E90				
	(N)HXH = (N)HXH-J		E90	E90	E90	R90	
	(N)HXCH			E90	E90		
	JE-H(St)H	E90	E90	E90	E90	R60	
	HDGs		E90	E90	E90	R90	
	HTKSH		E90		E90		
	HLGsekwf				E30		

Annex 2 Table 21. **Group X** cable and fixture test results - Special fixture for **cable clamps and brackets**
Since the DIN 4102-12 standard does not provide for an E120 classification, the table gives the result of the test in the form of the achieved time for circuit integrity maintenance under fire conditions (test report No FIRES-FR-257-08-AUNS of 17.12.2008 (Prakab), FIRES-FR-077-16-AUNE of 30.05.2016 (TECHNOKABEL),

	Typ kabla	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
PRAKAB	PRAFlaDur 1-CSKH-V180			120 min	120 min		
	Typ kabla	**X1**	**X2**	**X3**	**X4**	**X5**	**X6**
TECHNOKABEL	(N)HXH = (N)HXH-J 4x1.5	120 min					
	(N)HXCH 4x50	120 min					
	HDGsżo		120 min	120 min			
	HTKSH		120 min				
	HTKSHekw		120 min				
	HLGs		120 min				
	HLGsżo						

Annex 2 Table 22. **Group Y** cable classification - Special support structures **KS...H68**

	Typ kabla	Y
BITNER	(N)HXH = (N)HXH-J	E90
	HDGs	E90
	HTKSH	E90
	BiTflame AS	E90
	BiTflame S	E90
	Typ kabla	**Y**
TECHNOKABEL	NHXH = NHXH-J	E90
	HDGs	E90
	HTKSH	E90
	HTKSHekw	E90
	Typ kabla	**Y**
TELEFONIKA	(N)HXH = (N)HXH-J	E90
	(N)HXCH	E60
	JE-H(St)H	E60
	HTKSH	E90
	HLGsekwf	E60

Annex 2 Table 23. **Group Z*** cable classification - junction boxes **PMO...**

Box type	Cables Manufacturer Type	Fixing method	Fire resistance classification acc. to DIN 4102-12:1998
PMO 1 **PMO 1 E**	**KABLOTEK KABLO** JE-H(St)H...Bd FE180/E90 n x 2 x ≥ 0.8 mm; n ≥ 2 NHXH FE180/E90 4x1.5 mm^2	**1. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**TELE-FONIKA KABLE** HTKSH PH90 n x 2 x ≥ 1.0 mm; n ≥ 1 JE-H(St)H Bd FE180/E90 n x 2 x ≥ 0.8 mm; n ≥ 2 (N)HXH-J FE180/E90 4x1.5 mm^2 RE	**2. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**BITNER** HTKSH FE180/PH90/E90 n x 2 x ≥ 0.8 mm; n ≥ 1 JE-H(St)H FE180/E90 n x 2 x ≥ 0.8 mm; n ≥ 2 (N)HXH-J FE180/E90 n x 1.5 – 6 mm^2; n ≥ 2 HDGs FE180 PH90/E30-E90 n x ≥ 1.0 mm; n ≥ 2	**3. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**TECHNOKABEL** NHXH FE180 PH90/E90 n x 1.5 - 6 mm^2; n ≥ 2 (N)HXH FE180 PH90/E90 n x 1.5 – 4 mm^2; n ≥ 2 HDGs FE180 PH90/E30-E90 n x 1 mm^2; n ≥ 2	**4. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**PRAKAB PRAZSKA KABELOVNA** PRAFlaDur 90 (N)HXH n x 1.5 – 6 mm^2; n ≥ 2	**5. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**EUPEN** JE-H(St)H FE180/E90 n x 2 x ≥ 0.8 mm^2; n ≥ 2	**6. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**MADEX** HTKSH PH90 n x 2 x ≥ 1.0 mm; n ≥ 1	**7. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**STUDER** JE-H(St)H FE180/E90 n x 2 x ≥ 0.8 mm; n ≥ 2	**8. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E30**
PMO 2 **PMO 2 E**	**KABLOTEK KABLO** JE-H(St)H...Bd FE180/E90 n x 2 x ≥ 0.8 mm; n ≥ 2 NHXH FE180/E90 4x1.5 mm^2	**9. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**

PMO 2 **PMO 2 E**	**TELE-FONIKA KABLE** (N)HXH-J FE180/E90 4x1.5 mm^2 RE JE-H(St)H Bd FE180/E90 n x 2 x ≥ 0.8 mm; n ≥ 2	**10. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 2 **PMO 2 E**	**BITNER** (N)HXH-J FE180/E90 n x 1.5 – 6 mm^2; n ≥ 2 HTKSH FE180/PH90/E90 n x 2 x ≥ 0.8 mm; n ≥ 1 JE-H(St)H FE180/E90 n x 2 x ≥ 0.8 mm; n ≥ 2 HDGs FE180 PH90/E30-E90 n x ≥ 1.0 mm^2; n ≥ 2	**11. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 2 **PMO 2 E**	**TECHNOKABEL** NHXH-J FE180 PH90/E90 n x 1.5 – 10 mm^2; n ≥ 2 HDGs FE180 PH90/E30-E90 n x ≥ 1.0mm^2; n ≥ 2	**12. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 2 **PMO 2 E**	**PRAKAB PRAZSKA KABELOVNA** PRAFlaDur 90 (N)HXH n x 1.5 – 10 mm^2; n ≥ 2	**13. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 2 **PMO 2 E**	**EUPEN** (N)HXH FE180/E90 n x 1.5 – 10 mm^2; n ≥ 2 JE-H(St)H FE180/E90n x 2 x ≥ 0.8 mm^2; n ≥ 2	**14. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 2 **PMO 2 E**	**STUDER** (N)HXH FE180/E90 n x 1.5 – 10 mm^2; n ≥ 2 JE-H(St)H FE180/E90 n x 2 x ≥ 0.8 mm^2; n ≥ 2	**15. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E60**
PMO 2B **PMO 2 E**	**TELE-FONIKA KABLE** (N)HXH FE180/E90 4 x 1.5 mm^2	**16. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 3 **PMO 3 E**	**TECHNOKABEL** NHXH-J FE180 PH90/E90 n x 1.5 – 16 mm^2; n ≥ 2	**17. Direct mounting to ceiling or wall** **Box:** four certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E60**
PMO 3 **PMO 3 E**	**TECHNOKABEL** HDGs FE180 PH90/E30-E90 n x ≥1.0 mm^2; n ≥ 2	**18. Direct mounting to ceiling or wall** **Box:** four certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 3 **PMO 3 E**	**BITNER** NHXH FE180/E90 n x 1.5 – 16 mm^2; n ≥ 2 HDGs FE180/PH90 E90 n x ≥1.0 mm^2; n ≥ 2	**19. Direct mounting to ceiling or wall** **Box:** four certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 3B **PMO 3B E**	**TELE-FONIKA KABLE** (N)HXCH FE180/E90 n x 1.5 - 16 mm^2; n ≥ 2 JE-H(St)H FE180/E90 n x 2 x ≥ 0.8 mm^2; n ≥ 2	**20. Direct mounting to ceiling or wall** **Box:** four certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**

PMO 3 17/4 **PMO 3 17/4E**	**STUDER** JE-H(St)H FE180/E90 n x 2 x ≥ 0.8 mm^2; n ≥ 2	**21. Direct mounting to ceiling or wall** **Box:** four certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E30**
PMO4BE	**TELE-FONIKA KABLE** (N)HXH FE180/E90 4 x 1.5 mm^2	**22. Direct mounting to ceiling or wall** **Box:** two certified anchor bolts **Cables:** Distance between cable fixture (bracket) and box edge max. 150 mm	**E90**
PMO 1 **PMO 1 E**	**BITNER** BiTflame 1000 FE180/E90 4 x 1.5RE HTKSH FE180/PH90/E90 n x 2 x ≥ 0.8 mm; n ≥ 1	**23. Mounting to the side of the KFL300H60 cable tray** **Box:** two SGKM6x12 bolts **Design:** KFL300H60 cable tray fixed to the ceiling with WPCB1000 ceiling brackets and WWS/WWSO300 extension brackets, 1500 mm suspension spacing, 10 kg/m route load	**E30**
PMO 1 **PMO 1 E**	**BITNER** HDGs FE180/PH90/E90 n x ≥1.0 mm^2; n ≥ 2	**24. Mounting to CWP/CWOP40H40 channel** **Box:** two SGKM6x12 bolts **Design:** CWP/CWOP40H40 channel fixed to steel profiles by means of ZK8/19 clamps with PGM6 threaded rod, 1500 mm suspension spacing, route load 3.5 kg/m	**E60**
PMO 1 **PMO 1 E** **PMO 2** **PMO 2 E**	**BITNER** HDGs FE180/PH90/E90 n x ≥1.0 mm^2; n ≥ 2	**25. Mounting to the side of the KGJ/KGOJ400H60 cable tray** **Box:** two SGKM6x12 bolts **Design:** KGJ/KGOJ400H60 cable tray fixed to the ceiling with WPCB1200 ceiling brackets and WWS/WWSO300 extension brackets, 1500 mm suspension spacing, 10 kg/m route load	**E90**
PMO 1 **PMO 1 E**	**TELE-FONIKA KABLE** Flame-X 950 (N)HXH FE180/E90 4x1.5	**26. Mounting to CWP/CWOP40H40 channel** **Box:** two SGKM6x12 bolts **Desig:** CWP/CWOP40H40 channel suspended from trapezoidal sheet by PGM rods and WT/WTO hangers	**E30**
PMO 1 **PMO 1 E**	**TELE-FONIKA KABLE** Flame-X 950 Je-H(St)H 1x2x0.8 Bd Fe180/E90	**27. Mounting to CWP/CWOP40H40 channel** **Box:** two SGKM6x12 bolts **Desig:** CWP/CWOP40H40 channel suspended from trapezoidal sheet by PGM rods and WT/WTO hangers	**E30**
PMO 1 **PMO 1 E**	**TECHNOKABEL** NHXH-J FE180 PH90/E90 4 x 1.5 mm^2;	**28. Mounting to the side of the KDS/KDSO400H60 mesh tray** **Box:** 2x USSP bracket + 2xSGKM6x16 **Design:** KDS/KDSO400H60 mesh tray suspended from the ceiling by two PGM rods and CWP channel. Suspension spacing 1500mm, route load 20kg/m.	**E90**
PMO 1 **PMO 1 E**	**TECHNOKABEL** NHXH-J FE180 PH90/E90 4 x 1.5 mm^2;	**29. Mounting to the side of the KGL/KGOL300H60 tray** **Box:** 2xSGKM6x12 **Design:** KGL/KGOL300H60 cable tray fixed to the ceiling with WPCB1000 ceiling brackets, WWS/WWSO400 extension bracket and PGM pull rod. Suspension spacing 1500mm, route load 20kg/m.	**E60**
PMO 1 **PMO 1 E**	**TECHNOKABEL** NHXH-J FE180 PH90/E90 4 x 1.5 mm^2;	**30. Mounting to the side of the KFL300H60 tray** **Box:** 2xSGKM6x12 **Design:** KFL300H60 cable tray fixed to the ceiling with WPCB1000 ceiling brackets and WWSO300 extension bracket. Suspension spacing 1500mm, route load 10kg/m.	**E90**
PMO 1 **PMO 1 E**	**TECHNOKABEL** (N)HXH-J FE180 PH90/E90 4 x 1.5 mm^2;	**31. Mounting to CWP/CWOP40H40 channel** **Box:** two SGKM6x12 bolts **Desig:** CWP/CWOP40H40 channel suspended from trapezoidal sheet by PGM rods and WT/WTO hangers	**E30**

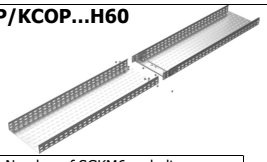
PMO 1 **PMO 1 E**	**TECHNOKABEL** HTKSH FE180/PH90/E30-E90 n x 2 x ≥ 0.8 mm; n ≥ 1	**32. Mounting to CWP/CWOP40H40 channel** **Box:** two SGKM6x12 bolts **Desig:** CWP/CWOP40H40 channel suspended from trapezoidal sheet by PGM rods and WT/WTO hangers	**E90**
PMO 2 **PMO 2 E**	**TECHNOKABEL** (N)HXH-J FE180 PH90/E90 4 x 1.5 mm^2;	**33. Mounting to the side of the DUD400H60 rack** **Box:** two SGKM6x12 bolts **Design:** DUD400H60 cable rack suspended from the ceiling by two PGM rods and CWP channel. Suspension spacing 1500mm, route load 20kg/m.	**E90**
PMO 2 **PMO 2 E**	**TECHNOKABEL** NHXH-J FE180 PH90/E90 4 x 1.5 mm^2;	**34. Mounting to the side of the KGL/KGOL300H60 tray** **Box:** 2xSGKM6x12 **Design:** KGL/KGOL300H60 cable tray fixed to the ceiling with WPCB1000 ceiling brackets, WWS/WWSO400 extension bracket and PGM pull rod. Suspension spacing 1500mm, route load 20kg/m.	**E60**

*- BAKS fire protection junction boxes may also be used with certified HTKSH FE180/PH90/E90, JE0H(St)H FE180/E90, HDGs FE180/E90, NHXH FE180/E90, NHXCH FE180/E90, (N)HXH FE180/E90, (N)HXCH FE180/E90 cables from other manufacturers, provided that these cables are of the E90 class for direct mounting to the ceiling on single brackets with 300 mm spacing (Annex 1 - structure B).

Annex 3

Connection of cable trays and racks, channels and wire mesh trays

KCP/KCOP...H60

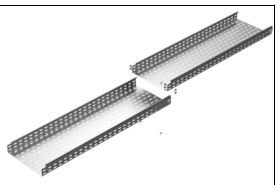


Connector
LPP/LPOPH60
or LPLPH60

Number of SGKM6x... bolts per connection.		
width	Connection plate	Connector
100	4	4
150	4	4
200	4	4
300	8	4
400	8	4
500	8	4
600	8	4

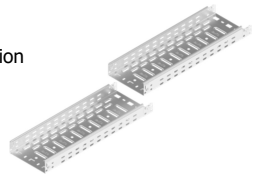
Connection plate
BL/BLO...

KGL/KGOL...H60
KCL/KCOL...H60
KBL...H60
KGJ/KGOJ...H60
KCJ/KCOJ...H60
KBJ...H60
KCD/KCOD...H60



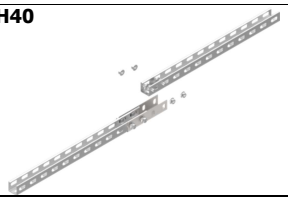
Number of SGKM6x... bolts per connection.		
Width	base	sidewall
50		2
100	2	2
150	2	2
200	2	2
300	2	2
400	4	2

KFL...H60
KFJ...H60
Screwless connection



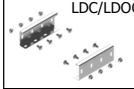
CWP/CWOP40H40

Channel connector LC40H40

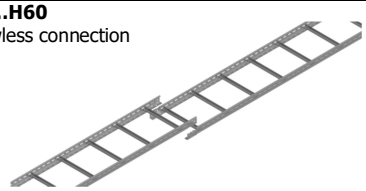


DUD...H60
DGOD...H60
DUP/DUOP...H60
DGOP...H60

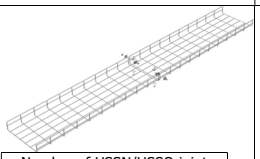
Connector
LDC/LDOCH60



DFP...H60
Screwless connection



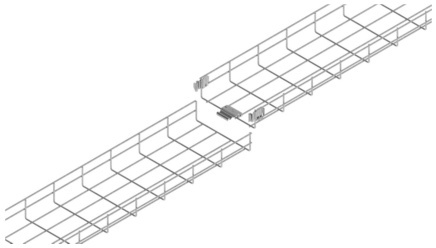
KDS/KDSO...H60
KSG...H60
KGS...H60



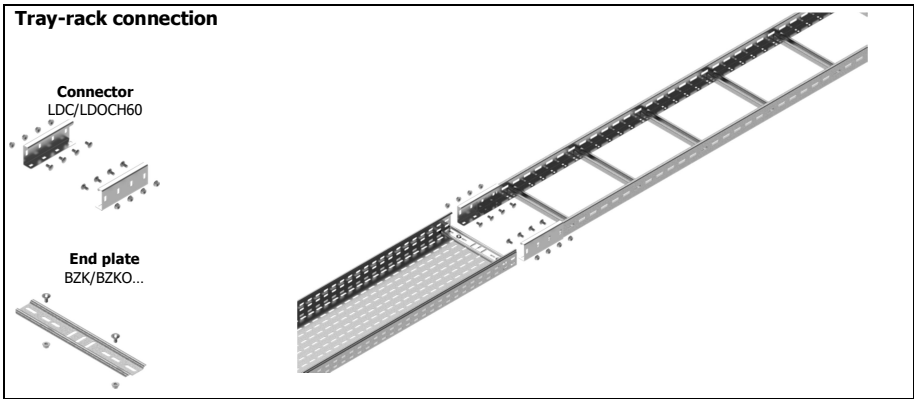
Joint connector
USSN/USSO

Number of USSN/USSO joint connector per connection.		
Width	Base	Sidewall
60	-	1
100	1	1
200	1	1
300	2	1
400	2	1
500	3	1
600	3	1

KDSZ...H60
Screwless connection



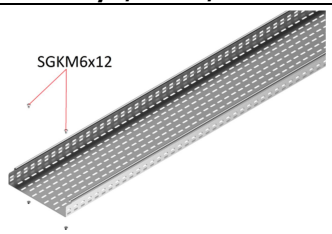
Tray-rack connection



CONNECTION OF TRAYS/RACKS/MESH TO SUPPORT STRUCTURE

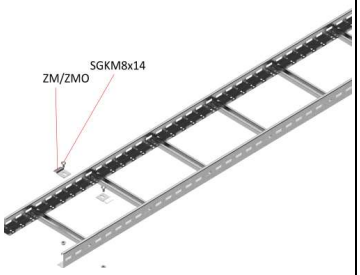
Details of trays / racks / wire mesh trays connection to the support structure

Trays



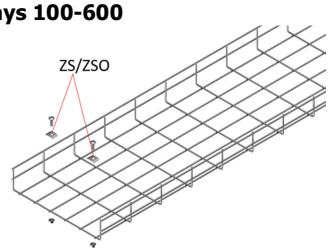
If necessary, use PW6 enlarged washers

Racks



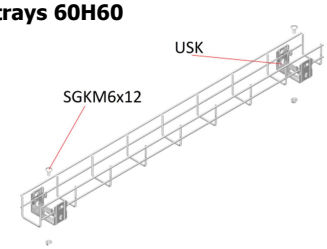
If necessary, use PW8 enlarged washers

Mesh trays 100-600



If necessary, use PW6 enlarged washers

Mesh trays 60H60



If necessary, use PW6 enlarged washers

END OF THE NATIONAL TECHNICAL ASSESSMENT

National Technical Assessment made by	**jr. brig. mgr inż. Grzegorz Mroczko** **Title or equivalent identification, first and last name**	..... **Date, signature**
National Technical Assessment authorisation officer	**mgr inż. Konrad Zaciera** **Title or equivalent identification, first and last name**	..... **Date, signature**

ADDITIONAL INFORMATION

Regulations

Act of 16 April 2004 on construction products (Dz. U. No. 92, item 881 as amended)

Regulation of the Minister of Infrastructure of 12 April 2002 on the technical conditions to be met by buildings and their location (Dz. U. No. 75, item 690, as amended)

Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on national technical assessments (Dz. U. 2016, item 1968)

Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on the methods of declaring the performance of construction products and the method of marking them with a construction mark (Dz U. of 2016, item 1966)

Regulation of the Minister of Internal Affairs and Administration of 7 June 2010 on the fire protection of buildings, other civil structures and sites (Dz. U. No. 109, item 719)