



TEST REPORT

FIRES-FR-016-14-AUNE

Tested property: Function in fire
Test method: STN 92 0205: 2012 (ZP-27/2008, DIN 4102-12: 1998-11)
Type of test: Accredited
Date of issue: 18. 02. 2014

Name of the product: Cable bearing system BAKS with cables business
Tele-Fonika Kable sp. z o.o. S.K.A.

Manufacturer: BAKS Kazimierz Sielski, ul. Jagodne 5, 05 - 480 Karczew, Poland
producer of cable bearing system

Tele-Fonika Kable sp. z o.o. S.K.A., ul. Wielicka 114, 30-630 Kraków, Poland
producer of cables

Sponsor: BAKS Kazimierz Sielski, ul. Jagodne 5, 05 - 480 Karczew, Poland

Test carried out: Fires, s.r.o., Testing laboratory
Task No.: PR-13-0525
Specimens received: 23. 01. 2014
Date of the test: 30. 01. 2014

Technician responsible for the technical side of this report: Bc. Dávid Šubert

Number of pages: 69
Test reports: 5

Copy No.: 1

Distribution list:

Copy No. 1 FIRES, s. r. o., Osloboditeľov 282, 059 35 Batizovce, Slovak Republic (electronic version)
Copy No. 2 BAKS Kazimierz Sielski, ul. Jagodne 5, 05 - 480 Karczew, Poland (electronic version)
Copy No. 3 Tele-Fonika Kable sp. z o.o. S.K.A., ul. Wielicka 114, 30-630 Kraków, Poland
(electronic version)
Copy No. 4 BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland
Copy No. 5 Tele-Fonika Kable sp. z o.o. S.K.A., ul. Wielicka 114, 30-630 Kraków, Poland

This report includes accreditation mark SNAS with additional mark ILAC-MRA. SNAS is signatory of ILAC-MRA, Mutual recognition agreement (of accreditation), which is focused on promoting of international acceptance of accredited laboratory data and reducing technical barriers to trade, such as the retesting of products on markets of signatories. More information about ILAC-MRA is on www.ilac.org. Signatories of ILAC-MRA are e.g. SNAS (Slovakia), CAI (Czech Republic), PCA (Poland), DakS (Germany) or BMWA (Austria). Up to date list of ILAC-MRA signatories is on www.ilac.org/documents/mra_signatories.pdf. FIRES, s.r.o. Batizovce is full member of EGOLF also, more information www.egolf.org.uk.



1. INTRODUCTION

This test report contains the results of test carried out by laboratory of FIRES, s.r.o., Testing laboratory in Batizovce, accredited by SNAS for testing. Certificate of accreditation No.: S-159. The purpose of the test was to gain information for product classification.

Test of function in fire was carried out according to standard STN 92 0205: 2012. Similar standards and regulations for tests of function in fire are ZP-27/2008 PAVUS and DIN 4102-12: 1998-11.

Deviations from standard at the test according to ZP-27/2008: This test was carried out according to standard STN 92 0205: 2012 and meets also all requirements of ZP-27/2008 and test results can be directly used for classification of tested cables according to ZP-27/2008. There are no deviations identified in process and carrying out of test.

Deviations from standard at the test according to DIN 4102-12: 1998-11: This test was carried out according to standard STN 92 0205: 2012 and meets requirements of DIN 4102-12: 1998-11. Basic deviation in process and carrying out of test between these standards is in measuring and in control of temperature in the test furnace. According to STN 92 0205: 2012, plate thermometers according to EN 1363-1 are used. According to DIN 4102-12: 1998-11, common thermocouples of construction which was used for this measurement till issue of EN 1363-1 are used. Measurement by plate thermometers acc. to EN 1363-1 can be considered as stricter method of temperature control in test furnace in compare with thermocouples used till issue of EN 1363-1. Therefore, it is possible to use results of test according to STN 92 025: 2012 for classification of tested cables according to DIN 4102-12: 1998-11, but not conversely. Identified deviation results in stricter course of test and it can lead to reduced classification of tested cables what is accepted as enhanced security in practice.

Representatives from the sponsor's side witnessing the test:

Mr. Jacek Kliczek	BAKS Kazimierz Sielski
Mr. Dariusz Gowronski	BAKS Kazimierz Sielski
Mrs. Milena Cierpiąła	Tele-Fonika Kable sp. z o.o. S.K.A.
Mr. Tomasz Zdechlik	Tele-Fonika Kable sp. z o.o. S.K.A.

test directed by	Ing. Marek Gorlický
test carried out by	Bc. Dávid Šubert
operator	Miroslav Hudák

2. MEASURING EQUIPMENT

Identification number	Measuring equipment	Note
F 90 004	Vertical test furnace for fire resistance testing	-
F 69 010	PLC system for data acquisition and control TECOMAT TC 700	-
F 40 017	Control and communication software to PLC TECOMAT TC 700	-
F 40 018	SW Reliance	-
F 40 019	Visual and calculating software to PLC TECOMAT TC 700	-
F 40 020	Driver Tecomat – Reliance (SW)	-
F 69 009	PLC system for data acquisition and climate control TECOMAT TC 604	-
F 60 001 - F 60 009	Sensors of temperature and relative air humidity	climatic conditions measuring
F 71 008, F 71 009	Transducer of differential pressure (-50 to + 150) Pa	pressure inside the test furnace



Identification number	Measuring equipment	Note
F 10 521 - F 10 528	Plate thermometers	temperature inside the test furnace, according to EN 1363-1
F 10 701	Sheathed thermocouple type K Ø 3 mm	ambient temperature
F 54 020	Digital calliper (0 to 200) mm	-
F 54 056	Racking meter	-
F 57 007	Digital stop-watch	-
F 96 015	Test signal panel	-

3. PREPARATION OF THE SPECIMENS

Testing laboratory didn't take off individual components of the specimens. Components take-off and its delivering to the testing laboratory were carried out by the test sponsor. Assembling of the supporting system into the test furnace and mounting of cables and weights into the supporting system was carried out by workers of BAKS Kazimierz Sielski and Tele-Fonika Kable sp. z o.o. S.K.A. under supervision of laboratory technician.

4. PREPARATION OF THE TEST

4.1 DESCRIPTION OF THE SPECIMENS STRUCTURE

Test specimen comprised from cable bearing system BAKS Kazimierz Sielski company – cable trays, ladders, mesh trays with accessories (consoles, supports, hangers, clips etc.) and power and communication halogen free cables of Tele-Fonika Kable sp. z o.o. S.K.A..

Cables

Used cables by test:

Power cables:

(N)HXH-J FE180/E90 4x1,5RE	(26x)
(N)HXH-O FE180/E90 4x50RM	(18x)
(N)HXCH-O FE180/E90 4x1,5RE/1,5	(22x)
(N)HXCH-O FE180/E90 4x50RM/25	(14x)

Communication cables:

HTKSH FE180 PH90 1x2x1.0 mm	(20x)
HLGsekwf 2x1 mm ²	(10x)
JE-H(St)H...Bd FE180/E90 2x2x0,8	(18x)

The length of cables was 5,5 m and 4,0 m from that was exposed to fire.

Cable bearing systems were made of following constructions:

Wall tracks No. 1 - 4

Tracks are made of profiles (CWP/CWOP40H40/1) fixed to wall of furnace in spacing of 1500 mm. Brackets type (WWS/WWSO400 – tracks No. 1 and 3, WMC/WMCO400 – tracks No. 2 and 4) are fixed to supports by screws (SM M10x30). Holders (UPW/UPWO) fixed at the end of brackets with screws (SGN M8x14). Brackets are fixed through these holders by threaded rods (PG M12) with washers and nuts (M12) to holder (UPWK/UPWKO) at the upper bracket. Upper holder is fixed to support on side wall by threaded rod (PG M12) and holder (WKPO).

Tracks No. 1 and 2:

Cable trays (KGJ/KGOJ400H60/B-400, steel sheet thickness 0,9 mm) fixed together by screws (SGN M6x12). Trays are fixed to brackets by screws (SGN M6x12) and loaded with 15kg.m⁻¹. Cables are fixed to trays by plastic stripes.

**Tracks No. 3 and 4:**

Cable ladders (DUD/DUOD400H60/B-400, steel sheet thickness 1,2 mm, spacing of transoms 300 mm) fixed together by two junctions (LDCH60N) and screws (SGN M8x14) on sides. Ladders are fixed to brackets by junctions (ZMO) and by screws (SGN M8x14) and loaded with 20kg.m^{-1} . Cables are fixed to ladders by cable clips (UK/UKO1 – according to cable cross-section).

Suspension tracks No. 5 – 7

Tracks are made of consoles (WPCW/WPCO1000) fixed to ceiling in spacing of 1500 mm. Brackets (WFL/WFLO400) are fixed to consoles by screws (SM M10x30 + PD11). Threaded rods (PG M10) are fixed through the brackets to ceiling.

Suspension tracks No. 8 – 10

Tracks are made of three consoles combined of horizontal supports (CWP/CWOP40H40/2 – length of profile is 2000 mm) and two threaded rods (PG M10) fixed to ceiling in spacing of 1500 mm.

Tracks No. 5 and 8:

Cable trays (KBJ400H60/B-400, steel sheet thickness 0,9 mm) fixed together by screws (SGK M6x12) and covered by cover (PKJ400) with clips (ZPD H60). Trays are fixed to brackets (supports) by screws (SGK M6x12) and loaded with 15kg.m^{-1} . Cables are not fixed to trays.

Tracks No. 6 and 9:

Cable trays (KCJ/KCOJ400H60/B-400, steel sheet thickness 0,9 mm) fixed together by screws (SGK M6x12). Trays are fixed to brackets (supports) by screws (SGK M6x12) and loaded with 15kg.m^{-1} . Cables are fixed to trays by plastic stripes.

Tracks No. 7 and 10:

Cable ladders (DUD/DUOD400H60/B-400, steel sheet thickness 1,2 mm, spacing of transoms 300 mm) fixed together by two junctions (LDCH60N) and screws (SGN M8x14) on sides. Ladders are fixed to brackets (supports) by junctions (ZMO) and by screws (SGN M8x14) and loaded with 25kg.m^{-1} (track no. 10 loaded with 20kg.m^{-1}). Cables are fixed to ladders by cable clips (UK/UKO1 – according to cable cross-section).

Suspension tracks No. 11 and 12

Tracks are made of consoles (WPCW/WPCO500) fixed to ceiling in spacing of 1500 mm.

Tracks No. 11 and 12:

Cable ladders (DUD/DUOD400H60/B-400, steel sheet thickness 1,2 mm, spacing of transoms 300 mm) fixed together by two junctions (LDCH60N) and screws (SGN M8x14) on sides. Ladders are fixed to consoles by holders (UTM/UTMO) and by screws (SM M8x16) and loaded with 20kg.m^{-1} . Cables are fixed to ladders by cable clips (UK/UKO1 – according to cable cross-section).

Wall track No. 13

Track is made of wall channels (KS130H68, steel sheet thickness 1,0 mm) fixed to wall by expansion screws (MKR6x32) in spacing of 800 mm.

Ceiling track No. 14

Track is made of cable hangers (OZ/OZO) fixed to ceiling by expansion screws (MKR6x32) in spacing of 600 mm.

Ceiling track No. 15

Track is made of cable hangers (OZS/OZSO) fixed to ceiling by expansion screws (MKR6x32) in spacing of 600 mm.

Ceiling track No. 16

Track is made of cable hangers (OZM/OZMO) fixed to ceiling by expansion screws (MKR6x32) in spacing of 600 mm.

More detailed information about construction of specimens is shown in the drawings which form an integral part of this test report. Drawings were delivered by sponsor.

All the information about technical specifications of used materials and semi-products, information about their type sign were delivered by sponsor. This information was not subject of the inspection of specimens. Parameters which were checked are quoted in paragraph 4.3.



4.2 DESCRIPTION OF SPECIMENS FIXATION

The test specimens were fixed on the ceiling of the test furnace which was created from aerated concrete panels with dimensions (4000 x 600 x 240) mm – 7 pieces and fixed to side walls made of aerated concrete blocks YTONG, 250 mm thick. Ceiling panels were jointed by beam which provides balance deflection of the ceiling.

The type of specimen's fixation into the test furnace is shown in drawing documentation and it was selected by the sponsor.

4.3 INSPECTION OF SPECIMENS

Before and after the function in fire test, conformity of drawings and test specimens was checked. Specimens corresponded to the drawings which are part of this test report. Inspection of specimens consisted of visual review of the test specimens, used materials as well as size verification (number and cross sections of conductors, thickness, measurements of cables and trays) and also the way of specimens fixation to supporting construction was subject of inspection.

4.4 CLIMATIC CONDITIONING OF SPECIMENS

Test specimens were stored in the hall of testing laboratory under the following climatic conditions:

Ambient air temperature [°C]

mean	18,9
standard deviation	1,1

Relative air humidity [%]

mean	45,5
standard deviation	3,3

The humidity equilibrium state of test specimens was not determined. Test specimens did not comprise hygroscopic materials.

5. CARRYING OUT OF THE TEST

5.1 TEST GENERALLY

The test was carried out in horizontal test furnace with dimensions of (4000 x 3000 x 3000) mm (length x width x height).

5.2 CONDITIONS OF THE TEST

Conditions in the test furnace (temperature – standard temperature/time curve, pressure, content of O₂) as well as in the testing room (ambient temperature) corresponded to EN 1363-1 during the test. Detailed information is part of this test report, or in Quality records of the testing laboratory.

Values characterizing environment in the testing room directly before the test:

Date of the test	Relative air humidity [%]	Ambient air temperature [°C]
30. 01. 2014	48,2	19,8



5.3 RESULTS OF THE TEST

Measured values are stated in this test report.

During the test there was no failure or damage of tracks – even during cooling down of the tracks after termination of the test.

6. CLOSING

Evaluation of the test:

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
1	2 cables (N)HXCH-O FE180/E90 4x50RM/25	13	90 minutes no failure / interruption
2	2 cables (N)HXH-O FE180/E90 4x50RM		90 minutes no failure / interruption
3	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5		65 minutes
4	2 cables (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
5	2 cables (N)HXH-O FE180/E90 4x50RM	12	34 minutes
6	2 cables (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
7	2 cables (N)HXCH-O FE180/E90 4x50RM/25	11	90 minutes no failure / interruption
8	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5		73 minutes
9	2 cables (N)HXH-O FE180/E90 4x50RM	10	90 minutes no failure / interruption
10	2 cables (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
11	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5	9	90 minutes no failure / interruption
12	2 cables (N)HXCH-O FE180/E90 4x50RM/25		90 minutes no failure / interruption
13	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5	8	81 minutes
14	2 cables (N)HXCH-O FE180/E90 4x50RM/25		90 minutes no failure / interruption
15	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5	16	80 minutes
16	2 cables (N)HXH-J FE180/E90 4x1,5RE		85 minutes
17	2 cables (N)HXH-J FE180/E90 4x1,5RE	7	80 minutes
18	2 cables (N)HXH-O FE180/E90 4x50RM		28 minutes
19	2 cables (N)HXH-J FE180/E90 4x1,5RE	6	32 minutes
20	2 cables (N)HXH-O FE180/E90 4x50RM		90 minutes no failure / interruption
21	2 cables (N)HXH-J FE180/E90 4x1,5RE	5	58 minutes
22	2 cables (N)HXH-O FE180/E90 4x50RM		90 minutes no failure / interruption
23	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5	15	90 minutes no failure / interruption
24	2 cables (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
25	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5	4	75 minutes
26	2 cables (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
27	2 cables (N)HXH-O FE180/E90 4x50RM		90 minutes no failure / interruption
28	2 cables (N)HXCH-O FE180/E90 4x50RM/25		90 minutes no failure / interruption
29	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5	3	82 minutes
30	2 cables (N)HXH-J FE180/E90 4x1,5RE		81 minutes
31	2 cables (N)HXCH-O FE180/E90 4x50RM/25		90 minutes no failure / interruption
32	2 cables (N)HXH-O FE180/E90 4x50RM		90 minutes no failure / interruption
33	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5	2	90 minutes no failure / interruption
34	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5		90 minutes no failure / interruption
35	cable (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
36	cable (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption



Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
37	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5	1	90 minutes no failure / interruption
38	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5		90 minutes no failure / interruption
39	cable (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
40	cable (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
41	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5	14	90 minutes no failure / interruption
42	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5		90 minutes no failure / interruption
43	cable (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
44	cable (N)HXH-J FE180/E90 4x1,5RE		90 minutes no failure / interruption
45	cable (N)HXCH-O FE180/E90 4x50RM/25		90 minutes no failure / interruption
46	cable (N)HXCH-O FE180/E90 4x50RM/25		90 minutes no failure / interruption
47	cable (N)HXH-O FE180/E90 4x50RM		90 minutes no failure / interruption
48	cable (N)HXH-O FE180/E90 4x50RM		90 minutes no failure / interruption
52	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8	13	64 minutes
53	2 cables HLGsekwf 2x1 mm ²		68 minutes
54	2 cables HTKSH FE180 PH90 1x2x1.0 mm	12	90 minutes no failure / interruption
55	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8		90 minutes no failure / interruption
56	2 cables HTKSH FE180 PH90 1x2x1.0 mm	11	65 minutes
57	2 cables HLGsekwf 2x1 mm ²		31 minutes
58	2 cables HTKSH FE180 PH90 1x2x1.0 mm	10	58 minutes
59	2 cables HTKSH FE180 PH90 1x2x1.0 mm	9	90 minutes no failure / interruption
60	2 cables HTKSH FE180 PH90 1x2x1.0 mm	8	58 minutes
61	2 cables HTKSH FE180 PH90 1x2x1.0 mm	16	90 minutes no failure / interruption
62	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8		90 minutes no failure / interruption
63	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8	7	90 minutes no failure / interruption
64	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8	5	64 minutes
65	2 cables HTKSH FE180 PH90 1x2x1.0 mm	15	90 minutes no failure / interruption
66	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8		90 minutes no failure / interruption
67	2 cables HTKSH FE180 PH90 1x2x1.0 mm	14	80 minutes
68	2 cables HLGsekwf 2x1 mm ²		33 minutes
69	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8		90 minutes no failure / interruption
70	2 cables HLGsekwf 2x1 mm ²	4	39 minutes
71	2 cables HTKSH FE180 PH90 1x2x1.0 mm		63 minutes
72	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8	3	90 minutes no failure / interruption
73	2 cables HTKSH FE180 PH90 1x2x1.0 mm	2	90 minutes no failure / interruption
74	2 cables HLGsekwf 2x1 mm ²	1	76 minutes
75	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8		90 minutes no failure / interruption

The fire test was discontinued in 96th minute at the request of test sponsor.

Specimens S1 – S48 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.

Specimens S52 – S75 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V / 0,03W.

Circuit breakers with rating 3 A were used.



Measured values inside the test furnace

Time t [min]	Temperature [°C]											Deviation d _e [%]	Pressure p [Pa]
	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To		
0	12,8	13,2	13,1	14,1	15,6	16,2	15,7	16,2	14,6	20,0	19,8	0,0	19,8
5	537,4	568,4	552,4	496,8	572,3	599,7	583,2	542,3	556,6	576,0	19,9	-4,0	19,3
10	643,6	701,1	695,0	697,7	666,2	704,8	710,8	709,0	691,0	678,0	19,9	-1,9	17,1
15	721,4	764,4	793,1	797,0	728,8	770,1	772,7	773,0	765,1	739,0	20,0	-0,6	17,7
20	769,9	811,5	834,4	836,4	785,6	826,0	824,5	840,5	816,1	781,0	20,0	0,9	18,1
25	816,5	856,3	858,2	850,5	855,6	846,8	864,6	853,5	850,3	815,0	20,1	1,8	17,7
30	842,5	878,4	866,3	873,9	864,9	885,6	894,4	878,6	873,1	842,0	20,1	2,3	20,0
35	868,2	898,9	906,7	884,8	873,2	893,0	910,3	884,1	889,9	865,0	20,2	2,7	19,6
40	854,9	848,3	837,3	830,2	845,2	846,5	839,7	830,8	841,6	885,0	20,2	2,0	17,4
45	893,5	893,7	891,4	877,4	902,7	909,7	893,9	871,9	891,8	902,0	20,3	1,3	18,3
50	904,0	912,6	900,8	883,5	906,5	917,0	907,4	890,4	902,8	918,0	20,3	1,0	18,7
55	927,5	933,5	924,6	900,9	921,0	931,7	923,4	902,7	920,7	932,0	20,4	0,8	19,4
60	931,7	926,4	932,5	916,0	933,1	943,4	940,9	918,5	930,3	945,0	20,5	0,6	17,7
65	932,9	947,4	967,7	957,8	930,9	942,6	960,7	945,5	948,2	957,0	20,5	0,4	18,5
70	943,0	955,7	982,1	975,2	942,4	953,8	976,7	964,1	961,6	968,0	20,5	0,3	17,2
75	954,8	967,4	992,2	988,5	954,5	965,3	994,2	974,4	973,9	979,0	20,6	0,2	19,7
80	967,9	975,8	1001,5	996,3	965,5	974,9	995,6	991,9	983,7	988,0	20,6	0,2	18,6
85	974,9	986,2	1012,3	1007,0	974,2	979,4	1007,0	997,3	992,3	997,0	20,7	0,1	17,8
90	986,8	994,8	1018,7	1011,6	988,5	991,9	1013,7	1002,9	1001,1	1006,0	20,8	0,1	17,9
91	986,4	997,0	1020,6	1013,7	988,8	992,3	1015,0	1003,9	1002,2	1008,0	20,7	0,1	19,8
92	989,6	997,0	1022,3	1015,8	990,7	994,0	1016,5	1005,7	1004,0	1009,0	20,7	0,1	17,8
93	992,7	1000,0	1023,4	1015,7	991,9	996,6	1017,2	1005,9	1005,4	1011,0	20,8	0,1	18,4
94	993,9	1001,0	1024,4	1015,7	993,6	997,9	1017,2	1005,1	1006,1	1012,0	20,8	0,0	18,8
95	995,1	1003,4	1024,3	1016,6	994,0	999,3	1018,1	1006,8	1007,2	1014,0	20,8	0,0	18,4

Tave Average temperature in the test furnace calculated from plate thermometers

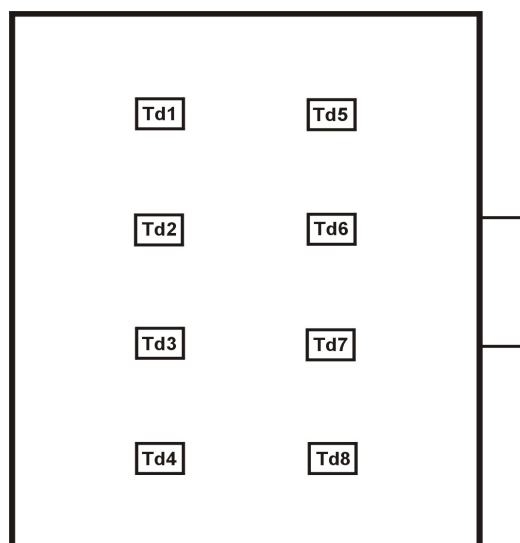
Tn Standard temperature in the test furnace laid down to test guideline

To Ambient temperature

d_e Deviation of the average temperature from the standard temperature calculated according to test guideline

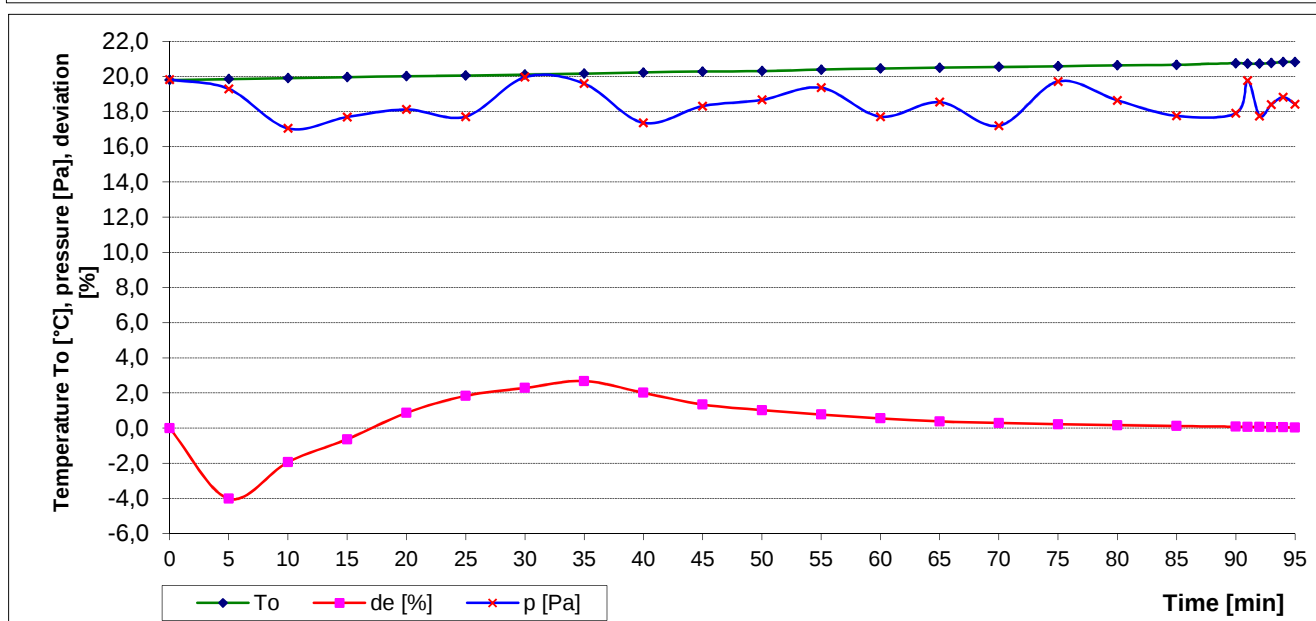
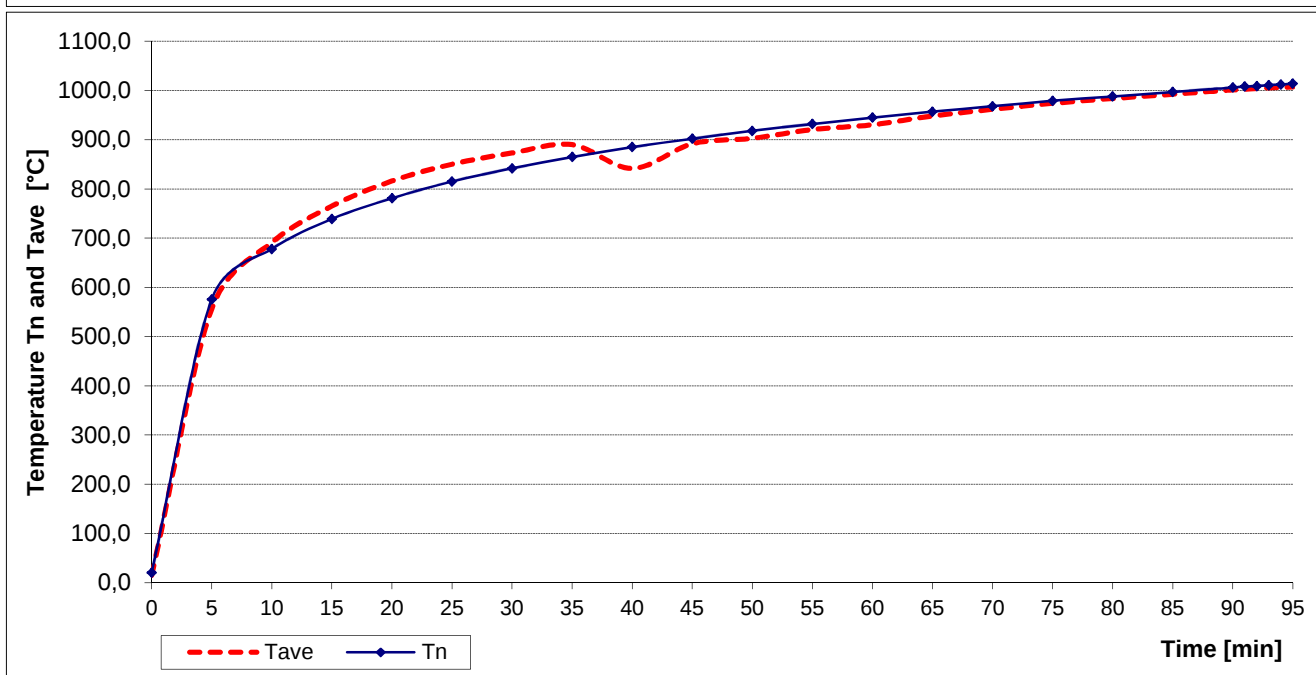
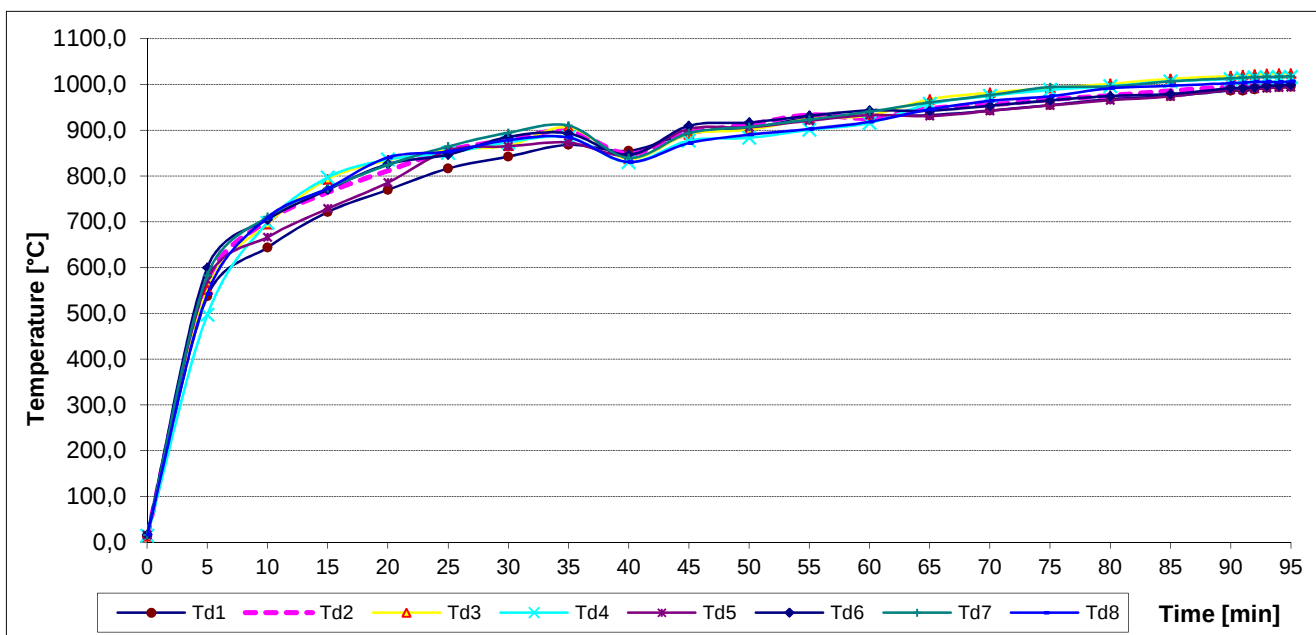
p Pressure inside the test furnace measured under the ceiling of the test furnace

Layout of measuring points inside the test furnace:





Measured values inside the test furnace /graph




Measured time of tested specimens from S1 to S10 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S1	1-L1	no failure / interruption
	2-L2	no failure / interruption
	3-L3	no failure / interruption
	4-PEN	no failure / interruption
S2	5-L1	no failure / interruption
	6-L2	no failure / interruption
	7-L3	no failure / interruption
	8-PEN	no failure / interruption
S3	9-L1	x
	10-L2	x
	11-L3	65:05
	12-PEN	x
S4	13-L1	no failure / interruption
	14-L2	no failure / interruption
	15-L3	no failure / interruption
	16-PEN	no failure / interruption
S5	17-L1	34:47
	18-L2	x
	19-L3	x
	20-PEN	x
S6	21-L1	no failure / interruption
	22-L2	no failure / interruption
	23-L3	no failure / interruption
	24-PEN	no failure / interruption
S7	25-L1	no failure / interruption
	26-L2	no failure / interruption
	27-L3	no failure / interruption
	28-PEN	no failure / interruption
S8	29-L1	x
	30-L2	73:39
	31-L3	73:39
	32-PEN	x
S9	33-L1	no failure / interruption
	34-L2	no failure / interruption
	35-L3	no failure / interruption
	36-PEN	no failure / interruption
S10	37-L1	no failure / interruption
	38-L2	no failure / interruption
	39-L3	no failure / interruption
	40-PEN	no failure / interruption

Specimen No.	Cables
1	2 cables (N)HXCH-O FE180/E90 4x50RM/25
2	2 cables (N)HXH-O FE180/E90 4x50RM
3	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
4	2 cables (N)HXH-J FE180/E90 4x1,5RE
5	2 cables (N)HXH-O FE180/E90 4x50RM
6	2 cables (N)HXH-J FE180/E90 4x1,5RE
7	2 cables (N)HXCH-O FE180/E90 4x50RM/25
8	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
9	2 cables (N)HXH-O FE180/E90 4x50RM
10	2 cables (N)HXH-J FE180/E90 4x1,5RE

- x Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
 Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
 Circuit breakers with rating 3 A were used.


Measured time of tested specimens from S11 to S20 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S11	41-L1	no failure / interruption
	42-L2	no failure / interruption
	43-L3	no failure / interruption
	44-PEN	no failure / interruption
S12	45-L1	no failure / interruption
	46-L2	no failure / interruption
	47-L3	no failure / interruption
	48-PEN	no failure / interruption
S13	49-L1	x
	50-L2	81:13
	51-L3	x
	52-PEN	x
S14	53-L1	no failure / interruption
	54-L2	no failure / interruption
	55-L3	no failure / interruption
	56-PEN	no failure / interruption
S15	57-L1	80:32
	58-L2	80:32
	59-L3	x
	60-PEN	x
S16	61-L1	x
	62-L2	x
	63-L3	85:54
	64-PEN	x
S17	65-L1	x
	66-L2	80:19
	67-L3	80:19
	68-PEN	x
S18	69-L1	x
	70-L2	x
	71-L3	28:53
	72-PEN	x
S19	73-L1	x
	74-L2	32:51
	75-L3	32:51
	76-PEN	x
S20	77-L1	no failure / interruption
	78-L2	no failure / interruption
	79-L3	no failure / interruption
	80-PEN	no failure / interruption

Specimen No.	Cables
11	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
12	2 cables (N)HXCH-O FE180/E90 4x50RM/25
13	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
14	2 cables (N)HXCH-O FE180/E90 4x50RM/25
15	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
16	2 cables (N)HXH-J FE180/E90 4x1,5RE
17	2 cables (N)HXH-J FE180/E90 4x1,5RE
18	2 cables (N)HXH-O FE180/E90 4x50RM
19	2 cables (N)HXH-J FE180/E90 4x1,5RE
20	2 cables (N)HXH-O FE180/E90 4x50RM

- x Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
 Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
 Circuit breakers with rating 3 A were used.


Measured time of tested specimens from S21 to S30 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S21	81-L1	x
	82-L2	58:32
	83-L3	58:32
	84-PEN	x
S22	85-L1	no failure / interruption
	86-L2	no failure / interruption
	87-L3	no failure / interruption
	88-PEN	no failure / interruption
S23	89-L1	no failure / interruption
	90-L2	no failure / interruption
	91-L3	no failure / interruption
	92-PEN	no failure / interruption
S24	93-L1	no failure / interruption
	94-L2	no failure / interruption
	95-L3	no failure / interruption
	96-PEN	no failure / interruption
S25	97-L1	x
	98-L2	75:13
	99-L3	75:13
	100-PEN	x
S26	101-L1	no failure / interruption
	102-L2	no failure / interruption
	103-L3	no failure / interruption
	104-PEN	no failure / interruption
S27	105-L1	no failure / interruption
	106-L2	no failure / interruption
	107-L3	no failure / interruption
	108-PEN	no failure / interruption
S28	109-L1	no failure / interruption
	110-L2	no failure / interruption
	111-L3	no failure / interruption
	112-PEN	no failure / interruption
S29	113-L1	82:37
	114-L2	82:37
	115-L3	x
	116-PEN	x
S30	117-L1	81:56
	118-L2	81:56
	119-L3	x
	120-PEN	x

Specimen No.	Cables
21	2 cables (N)HXH-J FE180/E90 4x1,5RE
22	2 cables (N)HXH-O FE180/E90 4x50RM
23	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
24	2 cables (N)HXH-J FE180/E90 4x1,5RE
25	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
26	2 cables (N)HXH-J FE180/E90 4x1,5RE
27	2 cables (N)HXH-O FE180/E90 4x50RM
28	2 cables (N)HXCH-O FE180/E90 4x50RM/25
29	2 cables (N)HXCH-O FE180/E90 4x1,5RE/1,5
30	2 cables (N)HXH-J FE180/E90 4x1,5RE

- x Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
 Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
 Circuit breakers with rating 3 A were used.


Measured time of tested specimens from S31 to S40 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S31	121-L1	no failure / interruption
	122-L2	no failure / interruption
	123-L3	no failure / interruption
	124-PEN	no failure / interruption
S32	125-L1	no failure / interruption
	126-L2	no failure / interruption
	127-L3	no failure / interruption
	128-PEN	no failure / interruption
S33	129-L1	no failure / interruption
	130-L2	no failure / interruption
	131-L3	no failure / interruption
	132-PEN	no failure / interruption
S34	133-L1	no failure / interruption
	134-L2	no failure / interruption
	135-L3	no failure / interruption
	136-PEN	no failure / interruption
S35	137-L1	no failure / interruption
	138-L2	no failure / interruption
	139-L3	no failure / interruption
	140-PEN	no failure / interruption
S36	141-L1	no failure / interruption
	142-L2	no failure / interruption
	143-L3	no failure / interruption
	144-PEN	no failure / interruption
S37	145-L1	no failure / interruption
	146-L2	no failure / interruption
	147-L3	no failure / interruption
	148-PEN	no failure / interruption
S38	149-L1	no failure / interruption
	150-L2	no failure / interruption
	151-L3	no failure / interruption
	152-PEN	no failure / interruption
S39	153-L1	no failure / interruption
	154-L2	no failure / interruption
	155-L3	no failure / interruption
	156-PEN	no failure / interruption
S40	157-L1	no failure / interruption
	158-L2	no failure / interruption
	159-L3	no failure / interruption
	160-PEN	no failure / interruption

Specimen No.	Cables
31	2 cables (N)HXCH-O FE180/E90 4x50RM/25
32	2 cables (N)HXH-O FE180/E90 4x50RM
33	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5
34	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5
35	cable (N)HXH-J FE180/E90 4x1,5RE
36	cable (N)HXH-J FE180/E90 4x1,5RE
37	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5
38	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5
39	cable (N)HXH-J FE180/E90 4x1,5RE
40	cable (N)HXH-J FE180/E90 4x1,5RE

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Circuit breakers with rating 3 A were used.


Measured time of tested specimens from S41 to S48 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S41	161-L1	no failure / interruption
	162-L2	no failure / interruption
	163-L3	no failure / interruption
	164-PEN	no failure / interruption
S42	165-L1	no failure / interruption
	166-L2	no failure / interruption
	167-L3	no failure / interruption
	168-PEN	no failure / interruption
S43	169-L1	no failure / interruption
	170-L2	no failure / interruption
	171-L3	no failure / interruption
	172-PEN	no failure / interruption
S44	173-L1	no failure / interruption
	174-L2	no failure / interruption
	175-L3	no failure / interruption
	176-PEN	no failure / interruption
S45	177-L1	no failure / interruption
	178-L2	no failure / interruption
	179-L3	no failure / interruption
	180-PEN	no failure / interruption
S46	181-L1	no failure / interruption
	182-L2	no failure / interruption
	183-L3	no failure / interruption
	184-PEN	no failure / interruption
S47	185-L1	no failure / interruption
	186-L2	no failure / interruption
	187-L3	no failure / interruption
	188-PEN	no failure / interruption
S48	189-L1	no failure / interruption
	190-L2	no failure / interruption
	191-L3	no failure / interruption
	192-PEN	no failure / interruption

Specimen No.	Cables
41	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5
42	cable (N)HXCH-O FE180/E90 4x1,5RE/1,5
43	cable (N)HXH-J FE180/E90 4x1,5RE
44	cable (N)HXH-J FE180/E90 4x1,5RE
45	cable (N)HXCH-O FE180/E90 4x50RM/25
46	cable (N)HXCH-O FE180/E90 4x50RM/25
47	cable (N)HXH-O FE180/E90 4x50RM
48	cable (N)HXH-O FE180/E90 4x50RM

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Circuit breakers with rating 3 A were used.


Measured time of tested specimen S52 to S61 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S52	209-L	64:05
	210-PEN	x
	211-L	64:05
	212-PEN	x
S53A	213-L	68:56
	214-PEN	x
S53B	215-L	68:58
	216-PEN	x
S54A	217-L	no failure / interruption
	218-PEN	no failure / interruption
S54B	219-L	no failure / interruption
	220-PEN	no failure / interruption
S55	221-L	no failure / interruption
	222-PEN	no failure / interruption
	223-L	no failure / interruption
	224-PEN	no failure / interruption
S56A	225-L	65:05
	226-PEN	x
S56B	227-L	no failure / interruption
	228-PEN	no failure / interruption
S57A	229-L	31:09
	230-PEN	x
S57B	231-L	31:46
	232-PEN	x
S58A	233-L	63:33
	234-PEN	x
S58B	235-L	58:42
	236-PEN	x
S59A	237-L	no failure / interruption
	238-PEN	no failure / interruption
S59B	239-L	no failure / interruption
	240-PEN	no failure / interruption
S60A	241-L	58:08
	242-PEN	x
S60B	243-L	61:32
	244-PEN	x
S61A	245-L	no failure / interruption
	246-PEN	no failure / interruption
S61B	247-L	no failure / interruption
	248-PEN	no failure / interruption

Specimen No.	Cables
52	2 cables JE-H(Si)H...Bd FE180/E90 2x2x0,8
53	2 cables HLGsekwf 2x1 mm ²
54	2 cables HTKSH FE180 PH90 1x2x1.0 mm
55	2 cables JE-H(Si)H...Bd FE180/E90 2x2x0,8
56	2 cables HTKSH FE180 PH90 1x2x1.0 mm
57	2 cables HLGsekwf 2x1 mm ²
58	2 cables HTKSH FE180 PH90 1x2x1.0 mm
59	2 cables HTKSH FE180 PH90 1x2x1.0 mm
60	2 cables HTKSH FE180 PH90 1x2x1.0 mm
61	2 cables HTKSH FE180 PH90 1x2x1.0 mm

- ✗ Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diodes 3V / 0,03W.
Circuit breakers with rating 3 A were used.


Measured time of tested specimens from S62 to S71 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S62	249-L	no failure / interruption
	250-PEN	no failure / interruption
	251-L	no failure / interruption
	252-PEN	no failure / interruption
S63	253-L	no failure / interruption
	254-PEN	no failure / interruption
	255-L	no failure / interruption
	256-PEN	no failure / interruption
S64	257-L	64:45
	258-PEN	x
	259-L	71:46
	260-PEN	x
S65A	261-L	no failure / interruption
	262-PEN	no failure / interruption
S65B	263-L	no failure / interruption
	264-PEN	no failure / interruption
S66	265-L	no failure / interruption
	266-PEN	no failure / interruption
	267-L	no failure / interruption
	268-PEN	no failure / interruption
S67A	269-L	no failure / interruption
	270-PEN	no failure / interruption
S67B	271-L	80:42
	272-PEN	x
S68A	273-L	33:14
	274-PEN	x
S68B	275-L	36:38
	276-PEN	x
S69	273-L	no failure / interruption
	274-PEN	no failure / interruption
	275-L	no failure / interruption
	276-PEN	no failure / interruption
S70A	281-L	39:24
	282-PEN	x
S70B	283-L	52:36
	284-PEN	x
S71A	285-L	63:55
	286-PEN	x
S71B	287-L	68:58
	288-PEN	x

Specimen No.	Cables
62	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8
63	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8
64	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8
65	2 cables HTKSH FE180 PH90 1x2x1.0 mm
66	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8
67	2 cables HTKSH FE180 PH90 1x2x1.0 mm
68	2 cables HLGsekwf 2x1 mm ²
69	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8
70	2 cables HLGsekwf 2x1 mm ²
71	2 cables HTKSH FE180 PH90 1x2x1.0 mm

- x Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diodes 3V / 0,03W.
Circuit breakers with rating 3 A were used.


Measured time of tested specimens S72 to S75 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S72	289-L	no failure / interruption
	290-PEN	no failure / interruption
	291-L	no failure / interruption
	292-PEN	no failure / interruption
S73A	293-L	no failure / interruption
	294-PEN	no failure / interruption
S73B	295-L	no failure / interruption
	296-PEN	no failure / interruption
S74A	297-L	76:53
	298-PEN	x
S74B	299-L	no failure / interruption
	300-PEN	no failure / interruption
S75	301-L	no failure / interruption
	302-PEN	no failure / interruption
	303-L	no failure / interruption
	304-PEN	no failure / interruption

Specimen No.	Cables
72	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8
73	2 cables HTKSH FE180 PH90 1x2x1.0 mm
74	2 cables HLGsekwf 2x1 mm ²
75	2 cables JE-H(St)H...Bd FE180/E90 2x2x0,8

- ✗ Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diodes 3V / 0,03W.
Circuit breakers with rating 3 A were used.



PHOTOS



Photo taken before the test.

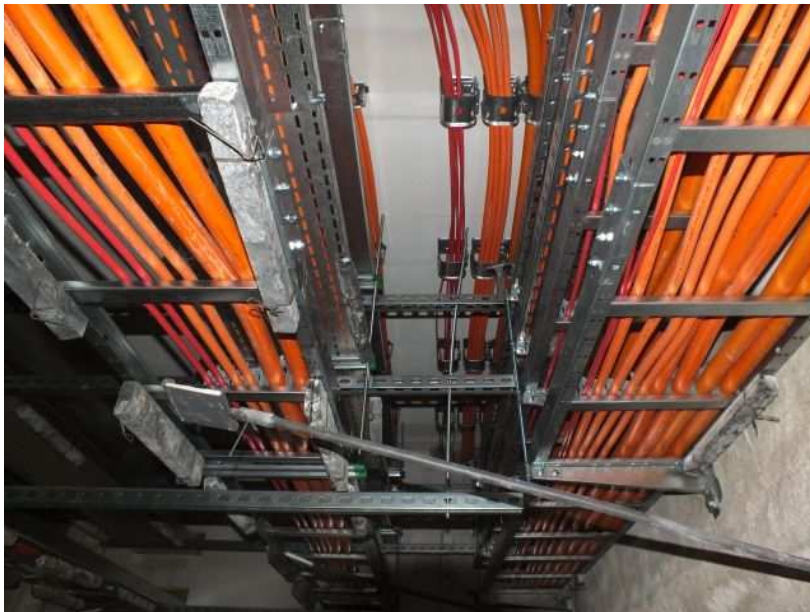


Photo taken before the test.



Photo taken before the test.



PHOTOS



Photo taken before the test.



Photo taken before the test.



Photo taken before the test.



PHOTOS



Photo taken after the test.



Photo taken after the test.



Photo taken after the test.



PHOTOS



Photo taken after the test.



Photo taken after the test.



Photo taken after the test.

CABLES

FLAME-X 950

(N)HXH FE180/E90

0,6/1kV

DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC



Halogen- free low smoke fire resistant security power cables



CONSTRUCTION		
Conductors:	bare copper conductor, circular solid class 1 (RE) or stranded circular or circular compacted class 2 (RM) according to EN 60228	
Insulation:	special cross-linked halogen-free fire resistant silicone compound	
Inner covering:	special flame-retardant and halogen-free compound	
Sheath:	thermoplastic halogen- free compound type HM4 according to DIN VDE 0276-604	
Colour of sheath:	orange	
Core identification:	according to DIN VDE 0293-308, HD 308 S2 or EN 50334	
	(N)HXH-O FE180/E90 without protective conductor	(N)HXH-J FE180/E90 with protective conductor
1-core:	black	green-yellow
2-core:	blue, brown	-
3-core:	brown, black, grey	green-yellow, blue, brown
3-core:*	blue, brown, black	-
4-core:	blue, brown, black, grey	green-yellow, brown, black, grey
4-core:*		green-yellow, blue, brown, black
5-core:	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
more 5-core:	black with numbering	green-yellow, others cores black with numbering

*For certain applications only.

CHARACTERISTIC	
Maximum conductor operating temperature:	+90°C
Lowest ambient temperature for fixed installation:	-40°C
Lowest installation temperature:	-15°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	15D - for single core cable; 12D - for multicore cable (D - overall cable diameter)
Maximum permissible tensile stress with cable grip for Cu:	50 N/mm ²

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950

(N)HXH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC

FIRE PERFORMANCE	
Insulation integrity FE 180:	DIN VDE 0472-814 (800 °C, 180 min.), IEC 60331-21
System integrity E90:	DIN 4102-12 (90 min.)
Flame propagation:	DIN EN 50266-2-2, VDE 0482-266-2-2, IEC 60332-3-22
Smoke density:	DIN EN 61034-2, VDE 0482-1034-2, IEC 61034-2
Gases evolved during combustion:	DIN EN 50267-2-2, VDE 0482-267-2-2, IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 μSmm ⁻¹

APPLICATIONS	
Fire resistant security cables for installation everywhere where high safety requirements have a special significance e.g., in industrial complexes, power stations, public buildings, hotels, underground railway systems, hospitals etc.	
Standard length cable packing	500 or 1000m on drums. Other forms of packing and delivery are available on request

APPROVALS	
SIQ, GOST, VDE	

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm ²	mm	kg/km	Ω/km
1x1,5RE	6,4	58	12,1
1x2,5RE	6,7	70	7,41
1x4RE	7,2	88	4,61
1x6RE	7,7	110	3,08
1x10RE	8,7	157	1,83
1x16RE	9,6	217	1,15
1x16RM	10	226	0,727
1x25RM	11,7	332	0,524
1x35RM	12,8	430	0,387
1x50RM	14,5	568	0,268
1x70RM	15,8	769	0,193
1x95RM	18,6	1058	0,153
1x120RM	20	1295	0,124
1x150RM	22,2	1592	0,0991
1x185RM	24,3	1972	0,0754
1x240RM	27,4	2543	0,0601
1x300RM	29,8	3154	12,1

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950

(N)HXH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm ²	mm	kg/km	Ω/km
2x1,5RE	11,5	186	12,1
2x2,5RE	12,3	223	7,41
2x4RE	13,2	274	4,61
2x6RE	14,2	336	3,08
2x10RE	16	461	1,83
2x16RE	17,8	621	1,15
2x16RM	18,6	659	0,727
2x25RM	22,8	1012	12,1
3x1,5RE	12,1	210	12,1
3x2,5RE	12,9	255	7,41
3x4RE	13,9	319	4,61
3x6RE	14,9	397	3,08
3x10RE	16,8	557	1,83
3x16RE	18,8	767	1,15
3x16RM	19,7	809	1,15
3x25RM	24,1	1244	0,727
3x35RM	26,4	1594	0,524
3x50RM	30,1	2105	0,387
3x70RM	33,8	2867	0,268
3x95RM	39,5	3929	0,193
3x120RM	42,7	4781	0,153
3x150RM	47,5	5890	0,124
3x185RM	52	7248	0,0991
3x240RM	61,4	9622	0,0754
3x25RM/16RM	25,4	1424	0,727 / 1,15
3x35RM/16RM	27,3	1785	0,524 / 1,15
3x50RM/25RM	31,6	2413	0,387 / 0,727
3x70RM/35RM	35,3	3260	0,268 / 0,524
3x95RM/50RM	41,3	4481	0,193 / 0,387
3x120RM/70RM	45,1	5564	0,153 / 0,268
3x150RM/70RM	49	6648	0,124 / 0,268
3x185RM/95RM	54,3	8297	0,0991 / 0,193
3x240RM/120RM	61,2	10684	0,0754 / 0,153
4x1,5RE	13	243	12,1
4x2,5RE	13,9	299	7,41
4x4RE	15	379	4,61

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950

(N)HXH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm ²	mm	kg/km	Ω/km
4x6RE	16,2	478	3,08
4x10RE	18,3	679	1,83
4x16RE	20,5	944	1,15
4x16RM	21,5	992	1,15
4x25RM	26,4	1530	0,727
4x35RM	28,9	1989	0,524
4x50RM	33,6	2689	0,387
4x70RM	37,3	3623	0,268
4x95RM	43,7	4973	0,193
4x120RM	47,6	6116	0,153
4x150RM	52,8	7498	0,124
4x185RM	58,2	9303	0,0991
4x240RM	65,6	11960	0,0754
4x35RM/16RM	30,2	2219	0,524/1,15
4x50RM/25RM	35,6	3054	0,387/0,727
4x70RM/35RM	39,3	4084	0,268/0,524
4x150RM/70RM	55,1	8400	0,124/0,268
5x1,5RE	14	286	12,1
5x2,5RE	15	356	7,41
5x4RE	16,3	455	4,61
5x6RE	17,6	577	3,08
5x10RE	19,9	824	1,83
5x16RE	22,4	1154	1,83
5x16RM	23,5	1213	1,15
5x25RM	28,9	1874	0,727
5x35RM	31,9	2437	0,524
5x50RM	37,3	3311	0,387
5x70RM	41,2	4448	0,268
5x95RM	48,6	6157	0,193
5x120RM	52,6	7515	0,153
5x150RM	59	9317	0,124
5x185RM	64,5	11470	0,0991
5x240RM	72,7	14750	0,0754
7x1,5RE	15,1	341	12,1
7x2,5RE	16,2	430	7,41
7x4RE	17,6	558	4,61

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com

FLAME-X 950

(N)HXH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm ²	mm	kg/km	Ω/km
7x4RM	18,5	595	4,61
10x1,5RE	18,6	474	12,1
10x1,5RM	19,4	503	12,1
10x2,5RE	20,2	604	7,41
10x2,5RM	21,2	644	7,41
12x1,5RE	19,2	524	12,1
12x1,5RM	20	555	12,1
12x2,5RE	20,8	672	7,41
12x2,5RM	21,8	715	7,41
14x1,5RE	20,1	582	12,1
14x1,5RM	21	617	12,1
14x2,5RE	21,8	751	7,41
14x2,5RM	22,9	799	7,41
16x1,5RE	21,1	649	12,1
16x1,5RM	22,1	689	12,1
16x2,5RE	22,9	842	7,41
16x2,5RM	24,1	896	7,41
19x1,5RE	22,2	728	12,1
19x1,5RM	23,2	772	12,1
19x2,5RE	24,1	951	7,41
19x2,5RM	25,4	1012	7,41
20x1,5RE	23,3	803	12,1
20x1,5RM	24,3	852	12,1
24x1,5RE	25,8	910	12,1
24x1,5RM	27	965	12,1
24x2,5RE	28	1190	7,41
24x2,5RM	29,5	1267	7,41
30x1,5RE	27,2	1066	12,1
30x1,5RM	28,5	1130	12,1
30x2,5RE	29,9	1423	7,41
30x2,5RM	31,5	1513	7,41
37x1,5RE	29,5	1275	12,1
37x1,5RM	30,9	1351	12,1

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com



FLAME-X 950

(N)HXH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC

Current ratings as defined in DIN VDE 0276-604, HD 604 S1-5G and DIN VDE 0276-627, HD 627 S1-7H

Operating temperature at conductor 90°C

Ambient air temperature 30°C

Installation: single multicore cable and three single core cables

Installation	1) 		
Number of loaded cores	1	3	3
Cross-section, mm ²	Current ratings in Ampere (A)		
1.5	33	24	26
2.5	43	32	34
4	57	42	44
6	72	53	56
10	99	74	77
16	131	98	102
25	177	133	138
35	217	162	170
50	265	197	207
70	336	250	263
95	415	308	325
120	485	359	380
150	557	412	437
185	646	475	507
240	774	564	604
300	901	649	697
400	1060	-	811
500	1252	-	940

¹⁾ Rated current for direct current systems with a far-distanced return conductor.

Current ratings for control cables – DIN VDE 0276-627, HD 627 S1-7H:

Conversion factors for multicore cable (≥ 5 cores)

The conversion factors are to be used for laying the cables in air (col. 3), to the values given in above tables

Number of loaded cores	Laying in air
5	0,75
7	0,65
10	0,55
14	0,50
19	0,45
24	0,40
40	0,35
61	0,30

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950

(N)HXH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC

Current ratings - DIN VDE 0298-4 and IEC 60364-5-523

Ambient temperature: 30°C

Conductor operating temperature: 90°C

Installation: in free air for fixed installation within buildings: in walls, on wall, ladder or cable trays

Installation method ¹	A2		B2		C		E	
	Multicore cables in insulating tubes, in thermally insulated walls		Multicore cables in insulating tubes on a wall		Single- or multicore cables on a wall		Multicore cables with a space of minimum 0,3 x diameter d to wall	
Number of loaded cores	2	3	2	3	2	3	2	3
Cross-section mm ²	Current ratings in Ampere (A)							
1,5	18,5	16,5	22	19,5	24	22	26	23
2,5	25	22	30	26	33	30	36	32
4	33	30	40	35	45	40	49	42
6	42	38	51	44	58	52	63	54
10	57	51	69	60	80	71	86	75
16	76	68	91	80	107	96	115	100
25	99	89	119	105	138	119	149	127
35	121	109	146	128	171	147	185	158
50	145	130	175	154	209	179	225	192
70	183	164	221	194	269	229	289	246
95	220	197	265	233	328	278	352	298
120	253	227	305	268	382	322	410	346
150	290	259	—	—	441	371	473	399
185	329	295	—	—	506	424	542	456
240	386	346	—	—	599	500	641	538
Table	52-C2	52-C4	52-C2	52-C4	52-C2	52-C4	52-C11	52-C11

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com



FLAME-X 950

(N)HXH FE180/E90

0,6/1kV

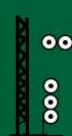


DIN VDE 0266, DIN 4102-12, RoHS Directive
2002/95/CE, Low-Voltage Directive 2006/95/EC

Current ratings for single core sheathed cables in free air.

Ambient temperature 30°C, conductor operating temperature 90°C

Single core sheathed cables with a space of minimum 1 x diameter (D) to wall.

Installation method	F			G	
	Touching			Spaced	
	 ≥ D	 ≥ D	 ≥ D	 ≥ D	 ≥ D
Number of loaded cores	2	3	3	3	3
Cross-section /mm ² /	Current ratings in Ampere (A)				
25	161	141	135	182	161
35	200	176	169	226	201
50	242	216	207	275	246
70	310	279	268	353	318
95	377	342	328	430	389
120	437	400	383	500	454
150	504	464	444	577	527
185	575	533	510	661	605
240	679	634	607	781	719
300	783	736	703	902	833
Table	52-C11	52-C11	52-C11	52-C11	52-C11

All the information contained in this document - including tables and diagrams - is given in good faith and believed to be correct at the time of publication. The information does not constitute a warranty nor representation for which TELE-FONIKA Kable assumes legal responsibility. TELE-FONIKA Kable reserves rights to introduce changes to the document at any time.

(N)HXH FE180/E90 04-02-2014

TELE-FONIKA Kable S.A.
www.tfkable.com

CABLES

FLAME-X 950

(N)HXCH FE180/E90

0,6/1kV

DIN VDE 0266, DIN 4102-12



**Halogen- free low smoke fire resistant security power cables
with copper concentric conductor**



CONSTRUCTION

Conductors:	bare copper conductor, circular solid class 1 (RE) or stranded circular or circular compacted class 2 (RM) according to EN 60228
Insulation:	special cross-linked halogen-free fire resistant silicone compound
Inner covering:	special flame-retardant and halogen-free compound
Concentric conductor:	inner layer - round copper wires, outer layer - copper tape
Separator:	tape
Sheath:	thermoplastic halogen- free compound type HM4 according to DIN VDE 0276-604
Colour of sheath:	orange
Core identification:	according to DIN VDE 0293-308, HD 308 S2 or EN 50334
	2-core: blue, brown
	3-core: brown, black, grey
	3-core:* blue, brown, black
	4-core: blue, brown, black, grey
	5-core: blue, brown, black, grey, black
	more 5-core: black with numbering

*For certain applications only.

CHARACTERISTIC

Maximum conductor operating temperature:	+90°C
Lowest ambient temperature for fixed installation:	-40°C
Lowest installation temperature:	-15°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	12D - for multicore cable (D - overall cable diameter)
Maximum permissible tensile stress with cable grip for Cu:	50 N/mm ²

TELE-FONIKA Kable S.A.
www.tfkable.com



FLAME-X 950

(N)HXCH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12

FIRE PERFORMANCE

Insulation integrity FE 180:	DIN VDE 0472-814 (800°C, 180 min.), IEC 60331-21
System integrity E90:	DIN 4102-12 (90 min.)
Flame propagation:	DIN EN 50266-2-2, VDE 0482-266-2-2, IEC 60332-3-22
Smoke density:	DIN EN 61034-2, VDE 0482-1034-2, IEC 61034-2
Gases evolved during combustion:	DIN EN 50267-2-2, VDE 0482-267-2-2, IEC 60754-2: pH ≥ 4,3; conductivity ≤ 10 μSmm ⁻¹

APPLICATIONS

Fire resistant security cables for installation everywhere where high safety requirements have a special significance e.g., in industrial complexes, power stations, public buildings, hotels, underground railway systems, hospitals etc.

Standard length cable packing	500 or 1000m on drums. Other forms of packing and delivery are available on request
--------------------------------------	--

APPROVALS

SIQ, GOST, VDE, CNBOP, VEIKI, DMT

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm ²	mm	kg/km	Ω/km
2x1,5RE/1,5	13,8	261	12,1/12,1
2x2,5RE/2,5	14,6	302	7,41/7,41
2x4RE/4	15,9	378	4,61/4,61
2x6RE/6	17,2	462	3,08/3,08
2x10RE/10	18,9	623	1,83/1,83
2x16RE/16	21,2	850	1,15/1,15
2x16RM/16	22,0	891	1,15/115
2x25RM/16	25,4	1154	0,727/1,15
3x1,5RE/1,5	14,4	287	12,1/12,1
3x2,5RE/2,5	15,2	336	7,41/7,41
3x4RE/4	16,6	425	4,61/4,61
3x6RE/6	17,9	526	3,08/3,08
3x10RE/10	19,7	720	1,83/1,83
3x16RE/16	22,2	999	1,15/1,15
3x16RM/16	23,1	1044	1,15/115
3x25RM/16	26,7	1393	0,727/1,15
3x35RM/16	29,0	1739	0,524/1,15
3x50RM/25	32,9	2339	0,387/0,727
3x70RM/35	36,5	3172	0,268/0,524
3x95RM/50	42,4	4364	0,193/0,387

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950

(N)HXCH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12

3x120RM/70	46,3	5404	0,153/0,268
3x150RM/70	51,3	6513	0,124/0,268
3x185RM/95	55,8	8071	0,0991/0,193
3x240RM/120	63,7	10423	0,0754/0,153
4x1,5RE/1,5	15,3	325	12,1/12,1
4x2,5RE/2,5	16,2	384	7,41/7,41
4x4RE/4	17,7	489	4,61/4,61
4x6RE/6	19,2	611	3,08/3,08
4x10RE/10	21,2	848	1,83/1,83
4x16RE/16	23,9	1183	1,15/1,15
4x16RM/16	24,9	1232	1,15/115
4x25RM/16	29,0	1682	0,727/1,15
4x35RM/16	31,5	2136	0,524/1,15
4x50RM/25	36,4	2924	0,387/0,727
4x70RM/35	40,0	3933	0,268/0,524
4x95RM/50	46,6	5415	0,193/0,387
4x120RM/70	51,2	6744	0,153/0,268
4x150RM/70	56,6	8135	0,124/0,268
4x185RM/95	62,0	10132	0,0991/0,193
4x240RM/120	70,3	13013	0,0754/0,153
5x1,5RE/1,5	16,3	371	12,1/12,1
5x2,5RE/2,5	17,3	445	7,41/7,41
5x4RE/4	19,0	570	4,61/4,61
5x6RE/6	20,6	716	3,08/3,08
5x10RE/10	22,8	1000	1,83/1,83
5x16RE/16	25,8	1397	1,15/1,15
5x16RM/16	26,9	1461	1,15/115
5x25RM/16	31,5	2026	0,727/1,15
5x35RM/16	33,9	2581	0,524/1,15
5x50RM/25	39,9	3531	0,387/0,727
5x70RM/35	43,9	4760	0,268/0,524
5x95RM/50	51,5	6600	0,193/0,387
5x120RM/70	56,4	8174	0,153/0,268
5x150RM/70	62,8	9953	0,124/0,268
5x185RM/95	68,1	12273	0,0991/0,193
5x240RM/120	77,4	15810	0,0754/0,153
7x1,5RE/2,5	17,4	431	12,1/7,41
7x2,5RE/2,5	18,5	523	7,41/7,41
7x4RE/4	20,3	679	4,61/4,61
7x4RM/4	21,2	720	4,61/4,61

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950

(N)HXCH FE180/E90

0,6/1kV



DIN VDE 0266, DIN 4102-12

Number and cross-sectional area of conductor	Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at temperature 20°C
n x mm ²	mm	kg/km	Ω/km
10x1,5RE/2,5	20,9	578	12,1/7,41
10x1,5RM/2,5	21,7	617	12,1/7,41
10x2,5RE/4	22,8	739	7,41/4,61
10x2,5RM/4	23,8	781	7,41/4,61
12x1,5RE/2,5	21,5	637	12,1/7,41
12x1,5RM/2,5	22,3	672	12,1/7,41
12x2,5RE/4	23,4	810	7,41/4,61
12x2,5RM/4	24,4	854	7,41/4,61
14x1,5RE/2,5	22,4	699	12,1/7,41
14x1,5RM/2,5	23,3	738	12,1/7,41
14x2,5RE/6	24,5	903	7,41/3,08
14x2,5RM/6	25,6	955	7,41/3,08
16x1,5RE/4	23,7	789	12,1/4,61
16x1,5RM/4	24,7	830	12,1/4,61
16x2,5RE/6	25,6	998	7,41/3,08
16x2,5RM/6	26,8	1057	7,41/3,08
19x1,5RE/4	24,8	870	12,1/4,61
19x1,5RM/4	25,8	917	12,1/4,61
19x2,5RE/6	26,8	1112	7,41/3,08
19x2,5RM/6	28,1	1178	7,41/3,08
20x1,5RE/6	26,0	960	12,1/3,08
20x1,5RM/6	27,0	1014	12,1/3,08
24x1,5RE/6	28,5	1078	12,1/3,08
24x1,5RM/6	29,7	1138	12,1/3,08
24x2,5RE/10	31,3	1423	7,41/1,83
24x2,5RM/10	32,4	1513	7,41/1,83
30x1,5RE/6	29,9	1240	12,1/3,08
30x1,5RM/6	31,2	1310	12,1/3,08
30x2,5RE/10	32,6	1655	7,41/1,83
30x2,5RM/10	34,2	1752	7,41/1,83
37x1,5RE/10	32,2	1506	12,1/1,83
37x1,5RM/10	33,6	1588	12,1/1,83

TELE-FONIKA Kable S.A.
www.tfkable.com

FLAME-X 950

(N)HXCH FE180/E90

0,6/1kV

DIN VDE 0266, DIN 4102-12

**Current ratings as defined in DIN VDE 0276-604, HD 604 S1-5G and DIN VDE 0276-627, HD 627 S1-7H**

Operating temperature at conductor 90°C

Ambient air temperature 30°C

Installation: single multicore cable and three single core cables

Installation			
Number of loaded cores	3		3
	laying in air*		
Cross-section, mm ²	Current ratings in Ampere (A)		
1.5	25		27
2.5	33		36
4	43		47
6	54		59
10	75		81
16	100		109
25	136		146
35	165		179
50	201		218
70	255		275
95	314		336
120	364		388
150	416		438
185	480		501
240	565		580
300	-		654

Current ratings for control cables – DIN VDE 0276-627, HD 627 S1-7H:

Conversion factors for multicore cable (≥ 5 cores)

The conversion factors are to be used for laying the cables in air (col. 3), to the values given in above tables

Number of loaded cores	Laying in air
5	0,75
7	0,65
10	0,55
14	0,50
19	0,45
24	0,40
40	0,35
61	0,30

TELE-FONIKA Kable S.A.
www.tfkable.com

FLAME-X 950

(N)HXCH FE180/E90

0,6/1kV

DIN VDE 0266, DIN 4102-12

**Current ratings - DIN VDE 0298-4 and IEC 60364-5-523**

Ambient temperature: 30°C

Conductor operating temperature: 90°C

Installation: in free air for fixed installation within buildings: in walls, on wall, ladder or cable trays

Installation method ¹	A2		B2		C		E	
	Multicore cables in insulating tubes, in thermally insulated walls		Multicore cables in insulating tubes on a wall		Single- or multicore cables on a wall		Multicore cables with a space of minimum 0,3 x diameter d to wall	
Number of loaded cores	2	3	2	3	2	3	2	3
Cross-section mm ²	Current ratings in Ampere (A)							
1,5	18,5	16,5	22	19,5	24	22	26	23
2,5	25	22	30	26	33	30	36	32
4	33	30	40	35	45	40	49	42
6	42	38	51	44	58	52	63	54
10	57	51	69	60	80	71	86	75
16	76	68	91	80	107	96	115	100
25	99	89	119	105	138	119	149	127
35	121	109	146	128	171	147	185	158
50	145	130	175	154	209	179	225	192
70	183	164	221	194	269	229	289	246
95	220	197	265	233	328	278	352	298
120	253	227	305	268	382	322	410	346
150	290	259	—	—	441	371	473	399
185	329	295	—	—	506	424	542	456
240	386	346	—	—	599	500	641	538
Table	52-C2	52-C4	52-C2	52-C4	52-C2	52-C4	52-C11	52-C11

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950

(N)HXCH FE180/E90

0,6/1kV

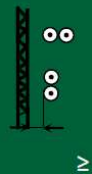
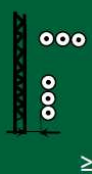
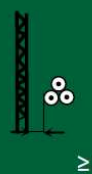
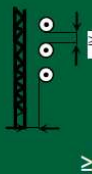


DIN VDE 0266, DIN 4102-12

Current ratings for single core sheathed cables in free air.

Ambient temperature 30°C, conductor operating temperature 90°C

Single core sheathed cables with a space of minimum 1 x diameter (D) to wall.

Installation method	F			G	
	Touching			Spaced	
					
Number of loaded cores	2	3	3	3	3
Cross-section /mm ² /	Current ratings in Ampere (A)				
25	161	141	135	182	161
35	200	176	169	226	201
50	242	216	207	275	246
70	310	279	268	353	318
95	377	342	328	430	389
120	437	400	383	500	454
150	504	464	444	577	527
185	575	533	510	661	605
240	679	634	607	781	719
300	783	736	703	902	833
Table	52-C11	52-C11	52-C11	52-C11	52-C11

All the information contained in this document - including tables and diagrams - is given in good faith and believed to be correct at the time of publication. The information does not constitute a warranty nor representation for which TELE-FONIKA Kable assumes legal responsibility. TELE-FONIKA Kable reserves rights to introduce changes to the document at any time.

TELE-FONIKA Kable S.A.
www.tfkable.com



FLAME-X 950

HDGs, HLGs, HLgGs

HDGsekwf, HLGsekwf, HLgGsekwf

300/500V

ZN-TF-208, BS 7629

TFKable

Halogen-free low smoke fire resistant cables



CONSTRUCTION

Conductors:	circular copper class 1, circular stranded copper class 2 or circular flexible stranded copper class 5 acc. to EN 60228
Drain wire:	tinned annealed copper wires class 1 or stranded class 2 acc. to EN 60228
Insulation:	special cross-linked heat resistant compound type E12 FR acc. to EN 50363.1
Optional binder:	non hygroscopic halogen free tape
Screen:	aluminium/polyester laminated tape and drain wire (ekwf)
Outer sheath:	thermoplastic zero halogen low smoke compound (H) acc. to ZN-TF-208

TYPE OF FLAME-X 950 CABLES

HDGs	cable with solid copper conductors (D), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H)
HLGs	cable with stranded copper conductors (L), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H)
HLgGs	cable with stranded flexible copper conductors (Lg), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H)
HDGsekwf	cable with solid copper conductors (D), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H), with electrostatic screen of aluminium/polyester laminated tape (ekwf)
HLGsekwf	cable with stranded copper conductors (L), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H), with electrostatic screen of aluminium/polyester laminated tape (ekwf)
HLgGsekwf	cable with stranded flexible copper conductors (Lg), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H), with electrostatic screen of aluminium/polyester laminated tape (ekwf)

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950**HDGs, HLGs, HLgGs****HDGsekwf, HLGsekwf, HLgGsekwf****300/500V**

ZN-TF-208, BS 7629

**CHARACTERISTIC**

Colour of sheath:	red	
Core identification:	acc. to HD 308 S2	
	without protective conductor	with protective conductor
2-core:	blue, brown	-
3-core:	brown, black, grey	green-yellow, blue, brown
4-core:	blue, brown, black, grey	green-yellow, brown, black, grey
5-core:	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
7 and more:	numbering or for identification by colour: in each layer- brown (starting core), blue (reference core), other cores natural	green-yellow and numbering or for identification by colour : in external layer- green-yellow, blue (reference core), others cores shall be natural, in other layers: brown (starting core), blue (reference core), other cores natural

CHARACTERISTIC

Maximum conductor operating temperature:	+90°C
Lowest ambient temperature for fixed installation:	-40°C
Lowest installation temperature:	-15°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	6 D (D is the overall diameter of the cable)

FIRE PERFORMANCE

Fire resistant:	IEC 60331: 3h at 750°C EN 50200 – PH 90 (for cables with overall diameter ≤ 20 mm) BS 6387 Category C – resistance to fire: 3 h at 950°C Category W – resistance to fire with water: 15 min at 650°C plus 15 min with water spray Category Z – resistance to fire with mechanical shock: 15 min at 950°C
Flame propagation:	IEC 60332-3-22 Category A, (EN 50266-2-2)
Smoke emission:	IEC 61034-2, BS EN 61034-2: transmittance values > 70%
Gases evolved during combustion:	IEC 60754-1, EN 50267-2-1: < 0,5% acid gas IEC 60754-2, EN 50267-2-2: pH ≥ 4,3; conductivity ≤ 10 μSmm ⁻¹

APPLICATIONS

Installations emergency lighting and evacuation systems, fire and smoke detection systems air-conditioning and alarm systems, automatic elevator doors, computer control rooms, offshore and marine emergency systems, emergency evacuation communicators.

Standard length cable packing	500 or 1000m on drums. Other forms of packing and delivery are available on request
--------------------------------------	--

TELE-FONIKA Kable S.A.
www.tfkable.com



CABLES

FLAME-X 950**HDGs, HLGs, HLgGs****HDGsekwf, HLGsekwf, HLgGsekwf****300/500V**

ZN-TF-208, BS 7629



APPROVALS

CNBOP, GOST

Number and cross-sectional area of conductor n x mm ²	Approximate overall diameter			Approximate net weight of cables		
	HDGs	HLGs	HLgGs	HDGs	HLGs	HLgGs
	mm			kg/km		
2x1	6,4	6,9	6,8	50	54	52
2x1,5	7,5	8,1	8,0	69	75	72
2x2,5	8,9	9,6	9,6	100	109	105
2x4	9,8	10,6	10,5	133	144	137
3x1	6,8	7,3	7,2	64	70	67
3x1,5	7,9	8,6	8,5	90	98	93
2x2,5	9,4	10,1	10,1	132	143	137
3x4	10,6	11,5	11,3	185	200	189
4x1	7,6	8,2	8,0	83	91	86
4x1,5	8,9	9,6	9,4	117	127	120
4x2,5	10,5	11,3	11,3	171	186	178
4x4	11,6	12,6	12,4	235	254	239
5x1	8,6	9,3	9,1	109	119	113
5x1,5	9,8	10,6	10,4	147	160	152
5x2,5	11,6	12,5	12,5	216	235	225
5x4	12,8	13,9	13,7	297	321	303
7x1	9,3	10,1	9,8	135	148	140
7x1,5	10,8	11,7	11,5	190	206	195
7x2,5	12,6	13,6	13,6	274	298	284
10x1	11,8	12,8	12,5	192	211	199
10x1,5	13,6	14,8	14,5	263	287	270
10x2,5	16,5	17,9	17,9	407	441	421

TELE-FONIKA Kable S.A.
www.tfkable.com



FLAME-X 950

HDGs, HLGs, HLgGs

HDGsekwf, HLGsekwf, HLgGsekwf

300/500V

ZN-TF-208, BS 7629



Number and cross-sectional area of conductor	Approximate overall diameter			Approximate net weight of cables		
	HDGs	HLGs	HLgGs	HDGs	HLGs	HLgGs
n x mm ²	mm			kg/km		
12x1	12,1	13,2	12,9	220	241	228
12x1,5	14,0	15,3	15,0	303	331	311
12x2,5	17,0	18,5	18,4	470	510	486
16x1	13,4	14,6	14,2	282	310	292
16x1,5	16,1	17,5	17,2	415	453	427
16x2,5	19,4	21,1	21,0	635	690	659
20x1	15,4	16,8	16,3	361	395	373
20x1,5	18,4	20,0	19,6	524	571	539
20x2,5	21,4	23,3	23,2	765	830	791
24x1	17,0	18,6	18,1	424	466	439
24x1,5	20,3	22,1	21,7	618	673	634
24x2,5	24,4	26,5	26,4	939	1019	972
30x1	18,6	20,2	19,7	535	587	553
30x1,5	21,4	23,4	23,0	742	808	760
30x2,5	25,8	28,0	27,9	1132	1228	1168
37x1	19,9	21,7	21,2	638	699	659
37x1,5	23,7	25,8	25,3	922	1004	945
37x2,5	27,7	30,2	30,1	1360	1476	1402

TELE-FONIKA Kable S.A.

www.tfkable.com



CABLES

FLAME-X 950**HDGs, HLGs, HLgGs****HDGsekwf, HLGsekwf, HLgGsekwf****300/500V**

ZN-TF-208, BS 7629



Number and cross-sectional area of conductor $n \times \text{mm}^2$	Approximate overall diameter			Approximate net weight of cables		
	HDGsekwf	HLGsekwf	HLgGsekwf	HDGsekwf	HLGsekwf	HLgGsekwf
	mm			kg/km		
2x1	7,1	7,4	7,3	65	68	65
2x1,5	8,2	8,6	8,5	90	94	89
2x2,5	9,6	10,1	10,1	130	137	131
2x4	10,5	11,1	11,0	177	186	176
3x1	7,5	7,9	7,7	81	85	81
3x1,5	8,7	9,1	9,0	113	118	112
2x2,5	10,1	10,7	10,7	165	174	166
3x4	11,3	12,0	11,9	232	244	230
4x1	8,5	9,0	8,7	103	109	103
4x1,5	9,9	10,6	10,4	143	152	143
4x2,5	11,9	12,8	12,8	211	224	214
4x4	13,6	14,8	14,6	291	310	291
5x1	10,4	10,8	10,6	132	139	129
5x1,5	11,6	12,1	12,0	171	181	169
5x2,5	13,4	14,0	14,0	244	258	245
5x4	14,6	15,4	15,3	326	346	323
7x1	11,2	11,7	11,4	161	169	158
7x1,5	12,7	13,3	13,1	219	230	215
7x2,5	14,5	15,2	15,2	306	324	306
10x1	14,0	14,6	14,3	226	238	222
10x1,5	15,8	16,6	16,3	300	316	296
10x2,5	18,7	19,7	19,7	450	476	453



CABLES

FLAME-X 950**HDGs, HLGs, HLgGs****HDGsekwf, HLGsekwf, HLgGsekwf****300/500V**

ZN-TF-208, BS 7629

Number and cross-sectional area of conductor $n \times \text{mm}^2$	Approximate overall diameter			Approximate net weight of cables		
	HDGsekwf	HLGsekwf	HLgGsekwf	HDGsekwf	HLGsekwf	HLgGsekwf
	mm			kg/km		
12x1	14,4	15,0	14,7	257	271	253
12x1,5	16,3	17,1	16,8	344	363	340
12x2,5	19,3	20,3	20,3	518	548	521
16x1	15,8	16,6	16,2	327	346	324
16x1,5	18,5	19,5	19,2	468	495	465
16x2,5	21,8	23,0	23,0	698	740	705
20x1	18,0	18,8	18,4	416	439	412
20x1,5	21,0	22,0	21,7	589	622	585
20x2,5	24,0	25,4	25,3	838	887	844
24x1	19,8	20,8	20,3	488	515	483
24x1,5	23,1	24,3	23,9	692	730	687
24x2,5	27,2	28,7	28,6	1027	1087	1036
30x1	21,5	22,5	22,0	612	646	608
30x1,5	24,4	25,6	25,3	828	874	822
30x2,5	28,7	30,3	30,2	1233	1306	1243
37x1	23,0	24,1	23,6	727	768	722
37x1,5	26,8	28,2	27,7	1027	1084	1021
37x2,5	30,8	32,6	32,5	1479	1566	1489

TELE-FONIKA Kable S.A.
www.tfkable.com



FLAME-X 950

HDGs, HLGs, HLgGs

HDGsekwf, HLGsekwf, HLgGsekwf

300/500V

ZN-TF-208, BS 7629



Electrical data

Minimum insulation resistance at temperature 20°C: 100 MΩ·km

Maximum L/R ratio and capacitance:

Nominal area of conductor	Maximum L/R ratio	Capacitance core - core	Capacitance core - screen
mm ²	μH/Ω	pF/m	pF/m
1	25	100	175
1,5	40	102	180
2,5	50	115	205

Maximum conductor resistance at temperature 20°C:

Nominal area of conductor	Conductor class 1		Conductor class 2		Conductor class 5	
	Plain wires	Tinned wires	Plain wires	Tinned wires	Plain wires	Tinned wires
mm ²	Ω/km		Ω/km		Ω/km	
1	18,1	18,2	18,1	18,2	19,5	20,0
1,5	12,1	12,2	12,1	12,2	13,3	13,7
2,5	7,41	7,56	7,41	7,56	7,98	8,21
4	4,61	4,70	4,61	4,70	4,95	5,09

TELE-FONIKA Kable S.A.

www.tfkable.com



CABLES

FLAME-X 950**HDGs, HLGs, HLgGs****HDGsekwf, HLGsekwf, HLgGsekwf****300/500V**

ZN-TF-208, BS 7629

Current rating

Ambient air temperature: 30°C. Conductor operating temperature: 90°C.

Current rating to IEC 60364-5-523

Cable clipped direct to or lying on a non-metallic surface					Cable in conduit on a wall or ceiling, or in trunking)				
Nominal area of conductor	One twin cable single phase AC or DC		One 3 or 4 core cable, 3 phase		Nominal area of conductor	One twin cable single phase AC or DC		One 3 or 4 core cable, 3 phase	
	Current rating	Volts drop per ampere par metre	Current rating	Volts drop per ampere par metre		Current rating	Volts drop per ampere par metre	Current rating	Volts drop per ampere par metre
mm ²	A	mV/ m	A	mV/ m	mm ²	A	mV/ m	A	mV/ m
1,0	19	46	17	40	1,0	14,5	46	13	40
1,5	24	31	22	27	1,5	18,5	31	16,5	26
2,5	33	19	30	16	2,5	25	19	22	16
4,0	45	12	40	10	4,0	33	12	30	10

Rating factors for ambient temperature

Ambient temperature, °C	30	35	40	45	50	55	60	65	70	75	80
Rating factor	1,00	0,96	0,91	0,87	0,82	0,76	0,71	0,65	0,58	0,50	0,41

All the information contained in this document - including tables and diagrams - is given in good faith and believed to be correct at the time of publication. The information does not constitute a warranty nor representation for which TELE-FONIKA Kable assumes legal responsibility. TELE-FONIKA Kable reserves rights to introduce changes to the document at any time.

TELE-FONIKA Kable S.A.
www.tfkable.com

**HTKSH FE180 PH90****HTKSHekw FE180 PH90****TF Kable**

acc on PN-92/T-90320 and PN-92/T-90321

RoHS 2002/95/WE,
REACH 1907/2006/WE
2006/95/WE

**Halogen- free low smoke fire resistant
wiring cables for telecommunication
and data processing systems**

CONSTRUCTION

Conductors: bare solid copper conductor acc on EN 13602
Insulation: special core insulation with mica tape and halogen-free compound acc. to EN 50290-2-26
Pairs: two cores twisted to pair

Identification of pairs:

Pair no.	A - wire	B - wire
1	white	blue
2	white	orange

Separator: polyester tape
Screen: aluminium/polyester laminated tape and solid copper drain wire (for HTKSHekw)
Drain wire:: solid tinned annealed copper wire 0,8 mm (for HTKSHekw)
Sheath: thermoplastic halogen-free, flame retardant compound type HM2 acc. to EN 50290-2-27
Colour of sheath:: grey, orange or red

TECHNICAL DATA

Loop resistance: max 75 Ω /km for 0,8 mm
 48 Ω /km for 1,0 mm
 26 Ω /km for 1,4 mm
 15 Ω /km for 1,8 mm

Insulation resistance at temperature 20°C:: min.200 M Ω x km

Capacitance unbalance: maximum 200 pF/100 m at 800 Hz (20% of the values, but one value up to 400 pF is allowed)

Test voltage 50 Hz: core/core – 500V; core/screen – 2000V

Flame retardant:

On a single cable: PN-EN 60332-1-2

The cable harness : PN-EN 60332-3-24 (kat. C)

Resistance to fire:

The behavior of the PH90: PN-EN 50200 PH 90, 90 min., 842°C

The behavior of the cable system E90: DIN 4102-12 (minimum 90 minut)

The behavior of the insulation during the operation of fire (FE180): PN-IEC 60331-23: 3h, 750°C

Emission of fumes during combustion: PN-EN 61034-2 (IEC 61034-2) transmittance of > 90

Corrosivity of gases: EN 50267-2-2 (IEC 60754-2: pH $\geq$ 3,5; conductivity $\leq$ 100 μ S-cm-1



CABLES

HTKSH FE180 PH90**HTKSHekw FE180 PH90****TF Kable****The maximum conductor operating temperature of cable:** +70°C**Minimum ambient temperature for fixed installation:** -30°C**Minimum ambient temperature at laying the cables:** -5°C**The maximum short circuit conductor temperature:** +160°C**Minimum bend radius:** 10 D (D – diameter of the cable)

Attaching cables: cables must be fastened directly to the base or hung to the underside of the cable tray or similar structure using metal clips such e.g steel, complying with BS EN 50 200. Plastic clips are not allowed.
Cables can be installed in the other systems such as load-bearing cable trays, ladders, individual handles, which fire resistance matches the fire resistance of the cable

Application: Fire-resistant cables provide power to devices whose performance under fire conditions is necessary to conduct a quick, safe rescue: emergency lightning circuits, smoke extractors, air conditioning, alarm, signaling and control systems, lifts, water pumps, water curtain producing devices, etc. They maintain their functions under fire conditions for a specified period of time; do not emit aggressive, corrosive gases (zero-halogen materials do not contain fluorine, chlorine or bromine) and dense smoke during burning; suppress fire spreading.
Fire-resistant cables are specially designed for telephone equipment interconnections, communication transmissions, and data processing in industrial electronic systems in places where increased fire protection requirements exist: schools, hospitals, supermarkets, airports, tunnels, multi-dwelling units, subway, underground car parks, sports and entertainment halls, stadiums, cinemas, theaters, museums, office buildings, educational centers, industrial complexes.
Fire-resistant cables can be used in permanent installations inside buildings acc. to the Minister of Infrastructure decree on technical conditions of buildings and their location (Dz. U. 2002, July 15th). The cables cannot be used in power installations or laid in the ground.

Standard package: 500 m in the intervertebral discs can offer other lengths and types of packaging.

HTKSH FE180 PH90				HTKSHekw FE180 PH90			
Number pairs and diameter of conductor	Approximate overall diameter	Approximate net weight of cable	Fire Load	Number pairs and diameter of conductor	Approximate overall diameter	Approximate net weight of cable	Fire Load
n x 2 x mm	mm	kg/km	kWh/m	n x 2 x mm	mm	kg/km	kWh/m
1 x 2 x 0,8	6,6	44	0,17	1 x 2 x 0,8	6,9	58	0,18
2 x 2 x 0,8	7,4	69	0,25	2 x 2 x 0,8	8,3	89	0,26
1 x 2 x 1,0	7,0	54	0,19	1 x 2 x 1,0	7,2	61	0,20
2 x 2 x 1,0	8,0	86	0,27	2 x 2 x 1,0	8,2	93	0,28
1 x 2 x 1,4	7,8	73	0,22	1 x 2 x 1,4	8,0	81	0,24
2 x 2 x 1,4	9,3	125	0,32	2 x 2 x 1,4	9,5	132	0,34
1 x 2 x 1,8	8,6	98	0,25	1 x 2 x 1,8	8,8	105	0,28
2 x 2 x 1,8	10,7	174	0,37	2 x 2 x 1,8	10,9	182	0,40

All the information contained in this document - including tables and diagrams - is given in good faith and believed to be correct at the time of publication. The information does not constitute a warranty nor representation for which TF Kable assumes legal responsibility. TF Kable reserves rights to introduce changes to the document at any time.



FLAME-X 950

JE-H(St)H...Bd FE180IE90

TF
Kable

Adapted to DIN VDE 0815

TT1-6365 v2



Halogen- free low smoke fire resistant wiring cables for telecommunication and data processing systems

CONSTRUCTION

Conductors:	bare solid copper conductor 0,8 mm		
Insulation:	special core insulation with mica tape and halogen-free cross-linked compound type HI1 acc. to DIN VDE 0207-23		
Pair:	two cores twisted to pair and each 4 pairs consist to unit		
Separator:	polyester tape		
Screen:	aluminium/polyester laminated tape and solid copper drain wire		
Drain wire:	solid tinned annealed copper wire 0,8 mm		
Sheath:	thermoplastic halogen-free, flame retardant compound type HM2 acc. to DIN VDE 0207-24		
Colour of sheath:	grey, orange or red		
Identification of pairs:	Pair no.	a-wire	b-wire
	1	blue	red
	2	grey	yellow
	3	green	brown
	4	white	black
	Two-pair cables shall be cabled in quad formation and colour coded: blue, yellow, red, grey		

TECHNICAL DATA

Operating voltage: peak voltage max. 225V (not for purposes of high current and power installation)
Loop resistance: maximum 73,2 Ω/km
Insulation resistance at temperature 20°C: minimum 100 MΩ x km
Mutual capacitance: maximum 120 nF/km at 800 Hz (this values may be extended at 20% with a make-up up to 4 pairs)
Capacitance unbalance: maximum 200 pF/100 m at 800 Hz (20% of the values, but one value up to 400 pF is allowed)
Test voltage 50 Hz: core/core – 500V; core/screen – 2000V

Temperature range:

flexing: - 5°C to + 50°C

fixed installation - 30°C to + 70°C

Minimum bending radius: 6 x D (D is the overall diameter of the cable)

Insulation integrity FE 180: DIN VDE 0472-814 (800°C, 180 minutes), IEC 60331

System integrity E90: DIN VDE 4102-12 (90 min.)

Flame retardant: VDE 0482-266-2-4, DIN EN 50266-2-4 (IEC 60332-3 Category C)

Smoke density: VDE 0482-1034-2, DIN EN 61034-2 (IEC 61034-2: light transmittance values > 70%)

Gases evolved during combustion: VDE 0482-267-2-2, DIN EN 50267-2-2 (IEC 60754-2: pH ≥ 3,5; conductivity ≤ 100 μS·cm⁻¹)

Application:

Fire resistant, halogen-free static screened installation cables for telecommunication purpose. The static screen prevents strong interference impulse. Suitable for fixed installation everywhere, where in case of fire human life and material assets are to be protected, e.g. in industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals. Not for purposes of high current and power installation.

Standard length cable

packing: 500 m on drums. Other forms of packing and delivery are available on request.

FLAME-X 950

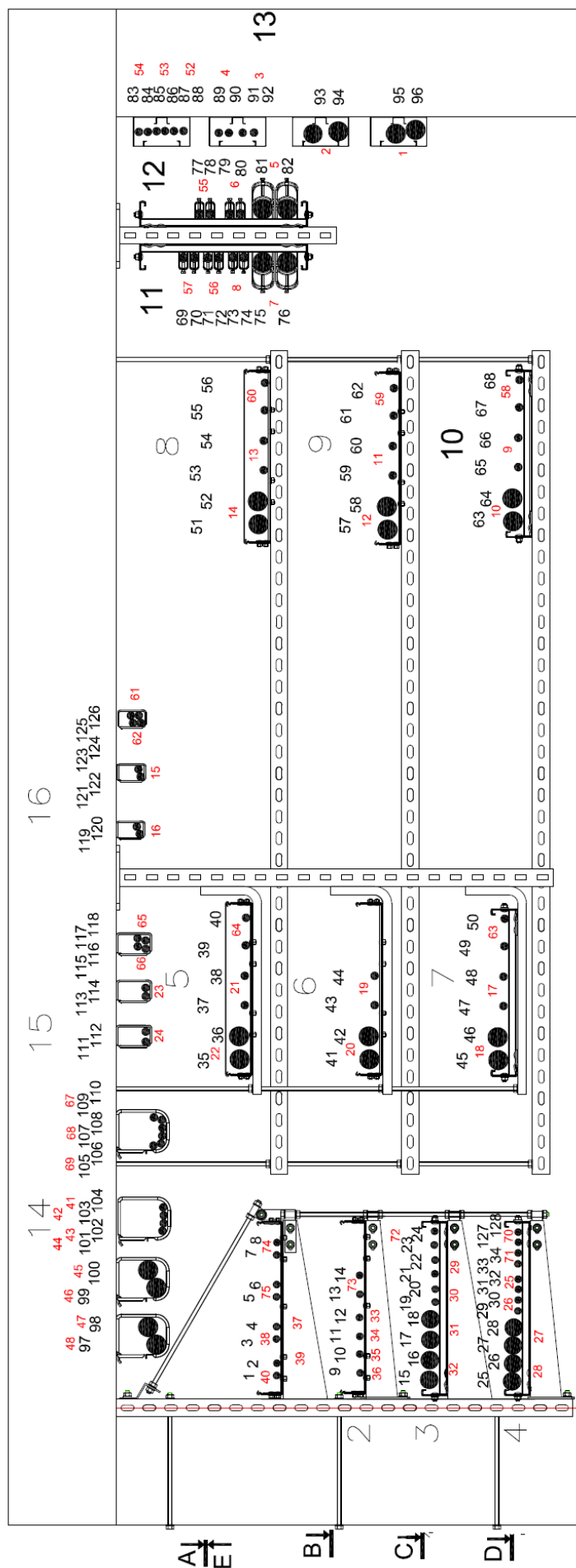
JE-H(St)H...Bd FE180IE90

TF
Kable

Adapted to DIN VDE 0815

Number pairs and diameter of conductor	Minimum thickness of insulation	Minimum thickness of sheath	Approximate overall diameter	Approximate net weight of cable
n x 2 x mm	mm	mm	mm	kg/km
1 x 2 x 0,8	1,1	1,2	10,5	105
2 x 2 x 0,8	1,1	1,2	11,9	151
4 x 2 x 0,8	1,1	1,2	18,3	277

BAKS – TELE–FONIKA 2014.01.30





DRAWINGS

No. BAKS	No. FIRES	Track No.	Cable type	Construction details
1	40	1	(N)HXH-J FE 180 /E90 4x 1,5RE	Korytko KGJ/KGOJ 400H 60/... B-400/ 1.5 m / 15kg/m / grubość blachy 0,9 mm Mocowanie: Ceownik CWP/CWOP40H40/1, wysięgnik WWS /WWSO 400 pręt gwintowany PG M12
2	39		(N)HXH-J FE 180/ E90 4x 1,5RE	
3	38		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
4	37		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
5	75		JE-H(St)H...Bd FE180/E90 2x2x0,8	
6			JE-H(St)H...Bd FE180/E90 2x2x0,8	
7	74		HLGsekwf 2x1 mm ²	
8			HLGsekwf 2x1 mm ²	
9	36	2	(N)HXH-J FE 180 /E90 4x 1,5RE	Korytko KGJ/KGOJ 400H 60/... B-400/ 1.5 m / 15kg/m / grubość blachy 0,9 mm Mocowanie: Ceownik CWP/CWOP40H40/1, wysięgnik WMC /WMCO 400 pręt gwintowany PG M12
10	35		(N)HXH-J FE 180/ E90 4x 1,5RE	
11	34		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
12	33		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
13	73		HTKSH FE180 PH90 1x2x1.0 mm	
14			HTKSH FE180 PH90 1x2x1.0 mm	
15	32	3	(N)HXH-O FE 180 /E90 4x 50RM	Drabinka DUD/DUOD 400H 60/... B-400/ 1.5 m / 20kg/m / grubość blachy 1,2 mm Mocowanie: Ceownik CWP/CWOP40H40/1, wysięgnik WWS /WWSO 400 pręt gwintowany PG M12
16			(N)HXH-O FE 180/ E90 4x 50RM	
17	31		(N)HXCH-O FE 180/E90 4x50RM/25	
18			(N)HXCH-O FE 180/E90 4x50RM/25	
19	30		(N)HXH-J FE 180 /E90 4x 1,5RE	
20			(N)HXH-J FE 180/ E90 4x 1,5RE	
21	29		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
22			(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
23	72		JE-H(St)H...Bd FE180/E90 2x2x0,8	
24			JE-H(St)H...Bd FE180/E90 2x2x0,8	
25	28	4	(N)HXCH-O FE 180/E90 4x50RM/25	Drabinka DUD/DUOD 400H 60/... B-400/ 1.5 m / 20kg/m / grubość blachy 1,2 mm Mocowanie: Ceownik CWP/CWOP40H40/1, wysięgnik WMC /WMCO 400 pręt gwintowany PG M12
26			(N)HXCH-O FE 180/E90 4x50RM/25	
27	27		(N)HXH-O FE 180 /E90 4x 50RM	
28			(N)HXH-O FE 180/ E90 4x 50RM	
29	26		(N)HXH-J FE 180 /E90 4x 1,5RE	
30			(N)HXH-J FE 180/ E90 4x 1,5RE	
31	25		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
32			(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
33	71		HTKSH FE180 PH90 1x2x1.0 mm	
34			HTKSH FE180 PH90 1x2x1.0 mm	
127	70		HLGsekwf 2x1 mm ²	
128			HLGsekwf 2x1 mm ²	
35	22	5	(N)HXH-O FE 180/ E90 4x 50RM	Korytko KBJ 400H 60/... + pokrywa PKJ400 B-400/ 1.5m / 15kg/m / grubość blachy 0,9 mm Mocowanie: WPCW/WPCO1000 WFL/WFLO400, pręt gwintowany PG M10
36			(N)HXH-O FE 180/ E90 4x 50RM	
37	21		(N)HXH-J FE 180 /E90 4x 1,5RE	
38			(N)HXH-J FE 180/ E90 4x 1,5RE	
39	64		JE-H(St)H...Bd FE180/E90 2x2x0,8	
40			JE-H(St)H...Bd FE180/E90 2x2x0,8	



DRAWINGS

No. BAKS	No. FIRES	Track No.	Cable type	Construction details
41	20	6	(N)HXH-O FE 180 /E90 4x 50RM	Korytko KCJ/KCOJ 400H 60/... B-400/ 1.5m / 15kg/m / grubość blachy 0,9 mm Mocowanie: WPCW/WPCO1000 WFL/WFLO400, pręt gwintowany PG M10
42			(N)HXH-O FE 180/ E90 4x 50RM	
43	19		(N)HXH-J FE 180 /E90 4x 1,5RE	
44			(N)HXH-J FE 180/ E90 4x 1,5RE	
45	18	7	(N)HXH-O FE 180/ E90 4x 50RM	Drabinka DUP/DUOP 400H 60/... B-400/ 1.5m / 25kg/m / grubość blachy 1,5 mm Mocowanie: WPCW/WPCO1000 WFL/WFLO400, pręt gwintowany PG M10
46			(N)HXH-O FE 180/ E90 4x 50RM	
47	17		(N)HXH-J FE 180 /E90 4x 1,5RE	
48			(N)HXH-J FE 180/ E90 4x 1,5RE	
49	63		JE-H(St)H...Bd FE180/E90 2x2x0,8	
50			JE-H(St)H...Bd FE180/E90 2x2x0,8	
51	14	8	(N)HXCH-O FE 180/E90 4x50RM/25	Korytko KBJ 400H 60/... + pokrywa PKJ400 B-400/ 1.5m / 15kg/m / grubość blachy 0,9 mm Mocowanie: Ceownik CWP/CWOP40H40/2, pręt gwintowany PG M10
52			(N)HXCH-O FE 180/E90 4x50RM/25	
53	13		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
54			(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
55	60		HTKSH FE180 PH90 1x2x1.0 mm	
56			HTKSH FE180 PH90 1x2x1.0 mm	
57	12	9	(N)HXCH-O FE 180/E90 4x50RM/25	Korytko KCJ/KCOJ 400H 60/... B-400/ 1.5 m / 15kg/m / grubość blachy 0,9 mm Mocowanie: Ceownik CWP/CWOP40H40/2, pręt gwintowany PG M10
58			(N)HXCH-O FE 180/E90 4x50RM/25	
59	11		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
60			(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
61	59		HTKSH FE180 PH90 1x2x1.0 mm	
62			HTKSH FE180 PH90 1x2x1.0 mm	
63	10	10	(N)HXH-O FE 180 /E90 4x 50RM	Drabinka DUP/DUOP 400H 60/... B-400/ 1.5m / 20kg/m / grubość blachy 1,5 mm Mocowanie: Ceownik CWP/CWOP40H40/2, pręt gwintowany PG M10
64			(N)HXH-O FE 180/ E90 4x 50RM	
65	9		(N)HXH-J FE 180 /E90 4x 1,5RE	
66			(N)HXH-J FE 180/ E90 4x 1,5RE	
67	58		HTKSH FE180 PH90 1x2x1.0 mm	
68			HTKSH FE180 PH90 1x2x1.0 mm	
69	57	11	HLGsekwf 2x1 mm ²	Drabinka DUP/DUOP 400H 60/... B-400/ 1.5m / 20kg/m / grubość blachy 1,5 mm Mocowanie: WPCW/WPCO500 + UTM/UTMO
70			HLGsekwf 2x1 mm ²	
71	56		HTKSH FE180 PH90 1x2x1.0 mm	
72			HTKSH FE180 PH90 1x2x1.0 mm	
73	8		(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
74			(N)HXCH-O FE 180/E90 4x1,5RE/1,5	
75	7		(N)HXCH-O FE 180/E90 4x50RM/25	
76			(N)HXCH-O FE 180/E90 4x50RM/25	
77	55	12	JE-H(St)H...Bd FE180/E90 2x2x0,8	Drabinka DUP/DUOP 400H 60/... B-400/ 1.5m / 20kg/m / grubość blachy 1,5 mm Mocowanie: WPCW/WPCO500 +UTM/UTMO
78			JE-H(St)H...Bd FE180/E90 2x2x0,8	
79	6		(N)HXH-J FE 180 /E90 4x 1,5RE	
80			(N)HXH-J FE 180/ E90 4x 1,5RE	
81	5		(N)HXH-O FE 180 /E90 4x 50RM	
82			(N)HXH-O FE 180/ E90 4x 50RM	

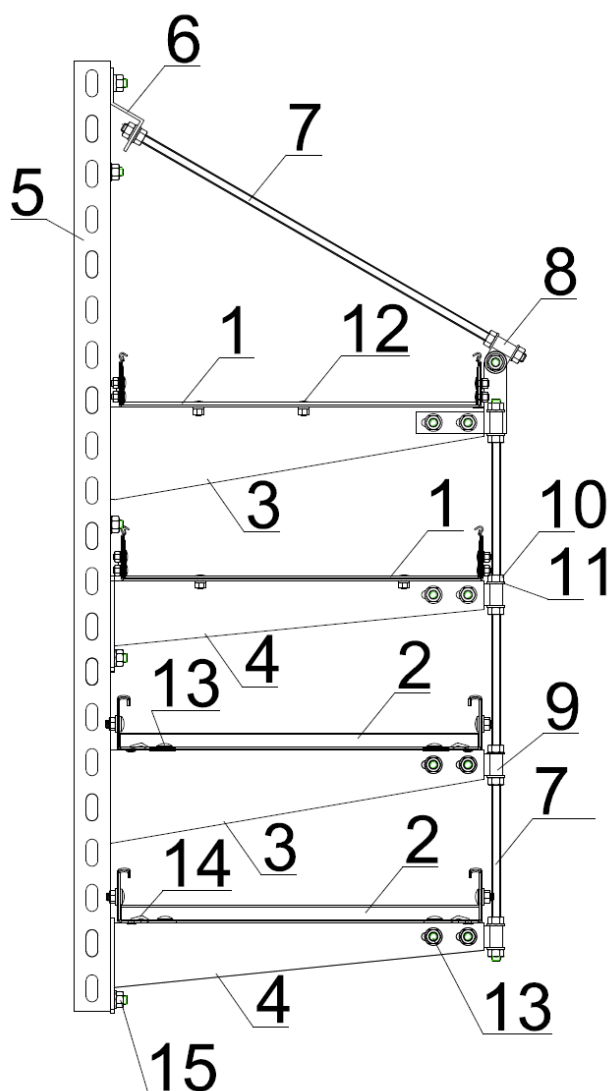


DRAWINGS

No. BAKS	No. FIRES	Track No.	Cable type	Construction details		
83	54	13	HTKSH FE180 PH90 1x2x1.0 mm	Kanał naścienny KN130H68		
84			HTKSH FE180 PH90 1x2x1.0 mm			
85	53		HLGsekwf 2x1 mm ²			
86			HLGsekwf 2x1 mm ²			
87	52		JE-H(St)H...Bd FE180/E90 2x2x0,8			
88			JE-H(St)H...Bd FE180/E90 2x2x0,8			
89	4		(N)HXH-J FE 180 /E90 4x 1,5RE			
90			(N)HXH-J FE 180/ E90 4x 1,5RE			
91	3		(N)HXCH-O FE 180/E90 4x1,5RE/1,5			
92			(N)HXCH-O FE 180/E90 4x1,5RE/1,5			
93	2		(N)HXH-O FE 180 /E90 4x 50RM			
94			(N)HXH-O FE 180/ E90 4x 50RM			
95	1		(N)HXCH-O FE 180/E90 4x50RM/25			
96			(N)HXCH-O FE 180/E90 4x50RM/25			
97	48		14		(N)HXH-O FE 180 /E90 4x 50RM	Obejma kablowa OZ/OZO Mocowanie co 600mm
98	47				(N)HXH-O FE 180/ E90 4x 50RM	
99	46	(N)HXCH-O FE 180/E90 4x50RM/25				
100	45	(N)HXCH-O FE 180/E90 4x50RM/25				
101	44	(N)HXH-J FE 180 /E90 4x 1,5RE				
102	43	(N)HXH-J FE 180/ E90 4x 1,5RE				
103	42	(N)HXCH-O FE 180/E90 4x1,5RE/1,5				
104	41	(N)HXCH-O FE 180/E90 4x1,5RE/1,5				
105	69	JE-H(St)H...Bd FE180/E90 2x2x0,8				
106		JE-H(St)H...Bd FE180/E90 2x2x0,8				
107	68	HLGsekwf 2x1 mm ²				
108		HLGsekwf 2x1 mm ²				
109	67	HTKSH FE180 PH90 1x2x1.0 mm				
110		HTKSH FE180 PH90 1x2x1.0 mm				
111	24	15	(N)HXH-J FE 180 /E90 4x 1,5RE	Obejma kablowa OZS/OZSO Mocowanie co 600mm		
112			(N)HXH-J FE 180/ E90 4x 1,5RE			
113	23		(N)HXCH-O FE 180/E90 4x1,5RE/1,5			
114			(N)HXCH-O FE 180/E90 4x1,5RE/1,5			
115	66		JE-H(St)H...Bd FE180/E90 2x2x0,8			
116			JE-H(St)H...Bd FE180/E90 2x2x0,8			
117	65		HTKSH FE180 PH90 1x2x1.0 mm			
118			HTKSH FE180 PH90 1x2x1.0 mm			
119	16	16	(N)HXH-J FE 180 /E90 4x 1,5RE	Obejma kablowa OZM/OZMO Mocowanie co 600mm		
120			(N)HXH-J FE 180/ E90 4x 1,5RE			
121	15		(N)HXCH-O FE 180/E90 4x1,5RE/1,5			
122			(N)HXCH-O FE 180/E90 4x1,5RE/1,5			
123	62		JE-H(St)H...Bd FE180/E90 2x2x0,8			
124			JE-H(St)H...Bd FE180/E90 2x2x0,8			
125	61		HTKSH FE180 PH90 1x2x1.0 mm			
126			HTKSH FE180 PH90 1x2x1.0 mm			

**DRAWINGS**

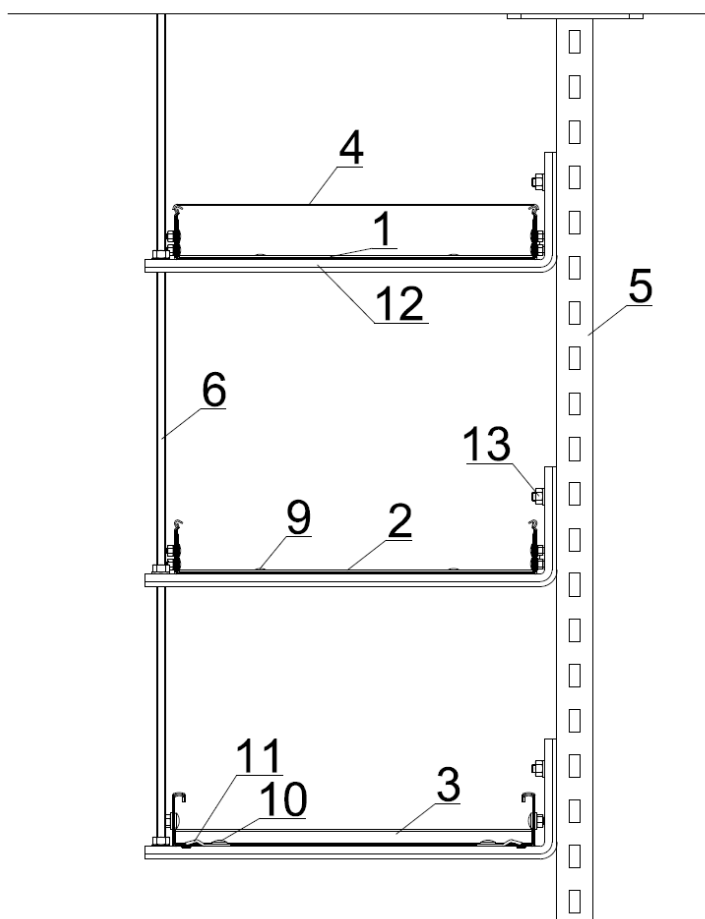
No.	Cable type	Average diameter [mm]	Cable weight [kg.m ⁻¹]	Count
1	(N)HXH-J FE180/E90 4x1,5RE	14,0	0,26	26
2	(N)HXH-O FE180/E90 4x50RM	36,0	3,00	18
3	(N)HXCH-O FE180/E90 4x1,5RE/1,5	14,5	0,33	22
4	(N)HXCH-O FE180/E90 4x50RM/25	38,5	3,30	14
5	JE-H(St)H...Bd FE180/E90 2x2x0,8	12,0	0,20	18
6	HLGsekwf 2x1 mm ²	7,4	0,07	10
7	HTKSH FE180 PH90 1x2x1.0 mm	7,0	0,05	20



15	Zacisk mocujący	SMM10X30	10
14	Zacisk mocujący	ZM/ZMO	4
13	Śruba z łbem grzybkowym	SGNM8x14	12
12	Śruba z łbem grzybkowym	SGNM6x12	4
11	Podkładka	PP12	12
10	Nakrętka	NSM12	12
9	Uchwyt	UPWK	1
8	Uchwyt	UPW	4
7	Pręt gwintowany	PGM12/...	2
6	Wieszak kątowy pręta	WKPO	1
5	Ceownik wzmacniony	CWP/CWOP40H40/1	1
4	Wysięgnyk	WMC/WMCO400	2
3	Wysięgnyk	WWS/WWSO400	2
2	Drabinka	DUD/DUOD400H60/...	2
1	Korytko	KGJ/KGOJ400H60/...	2
L.p.	Nazwa	Symbol	Szt.



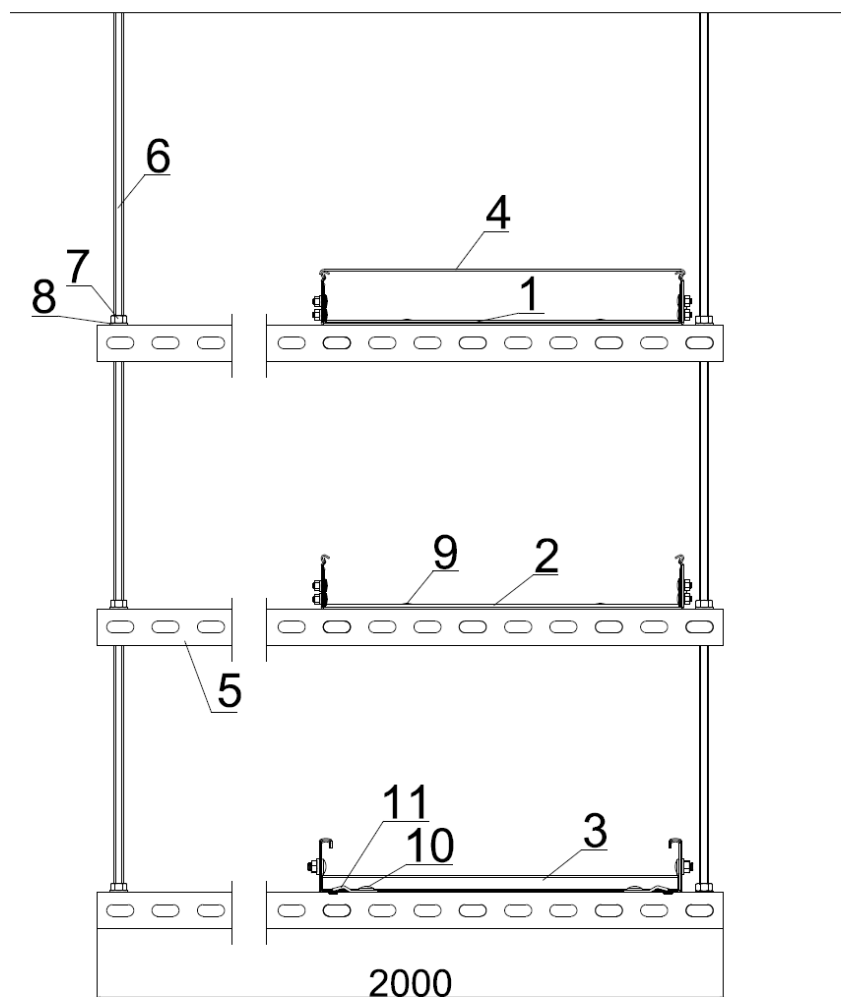
DRAWINGS



13	Śruba	SM M10x30 + PD11	3
12	Wspornik fajkowy	WFL/WFLO400	3
11	Zacisk mocujący	ZM	2
10	Śruba z łbem grzybkowym	SGNM8x14	2
9	Śruba z łbem grzybkowym	SGNM6x12	4
8	Podkładka	PP10	6
7	Nakrętka	NSM10	6
6	Pręt gwintowany	PGM10/...	2
5	Wspornik sufitowy	WPCW/WPCO1000	1
4	Pokrywa	PKJ400/...	1
3	Drabinka	DUP/DUOP400H60/...	1
2	Korytko	KCJ/KCOJ400H60/...	1
1	Korytko	KBJ400H60/...	1
L.p.	Nazwa	Symbol	Szt.



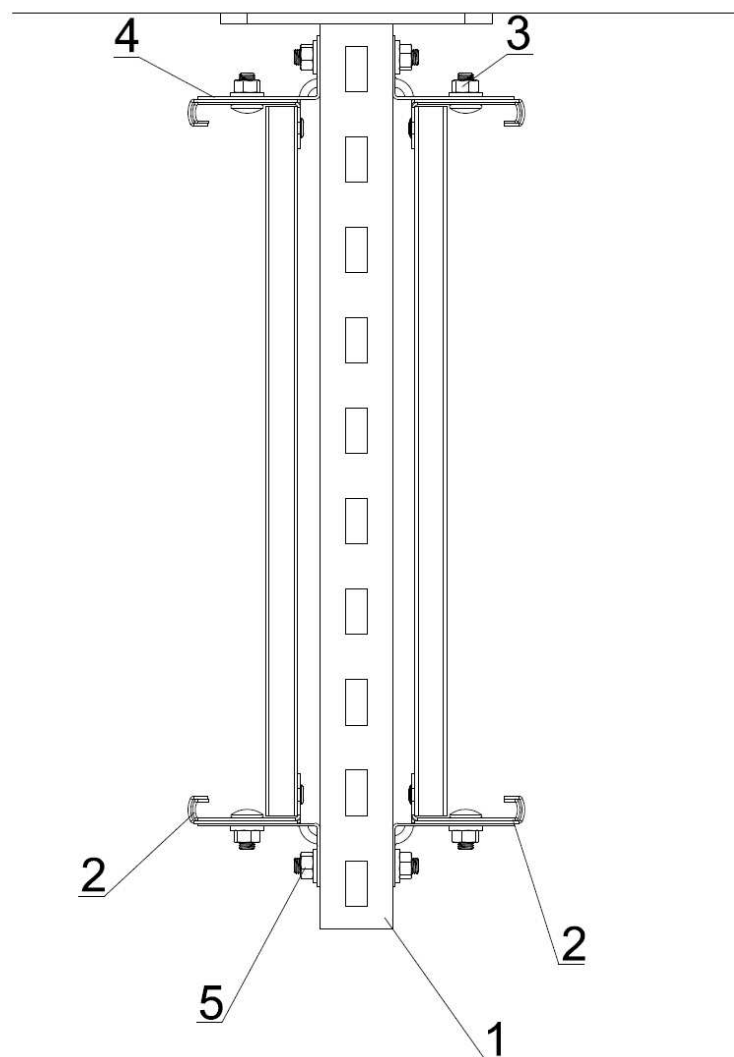
DRAWINGS



11	Zacisk mocujący	ZM	2
10	Śruba z łbem grzybkowym	SGNM8x14	2
9	Śruba z łbem grzybkowym	SGNM6x12	4
8	Podkładka	PP10	12
7	Nakrętka	NSM10	12
6	Pręt gwintowany	PGM10/...	2
5	Ceownik wzmocniony	CWP/CWOP40H40/2	3
4	Pokrywa	PKJ400/...	1
3	Drabinka	DUP/DUOP400H60/...	1
2	Korytko	KCJ/KCOJ400H60/...	1
1	Korytko	KBJ400H60/...	1
L.p.	Nazwa	Symbol	Szt.



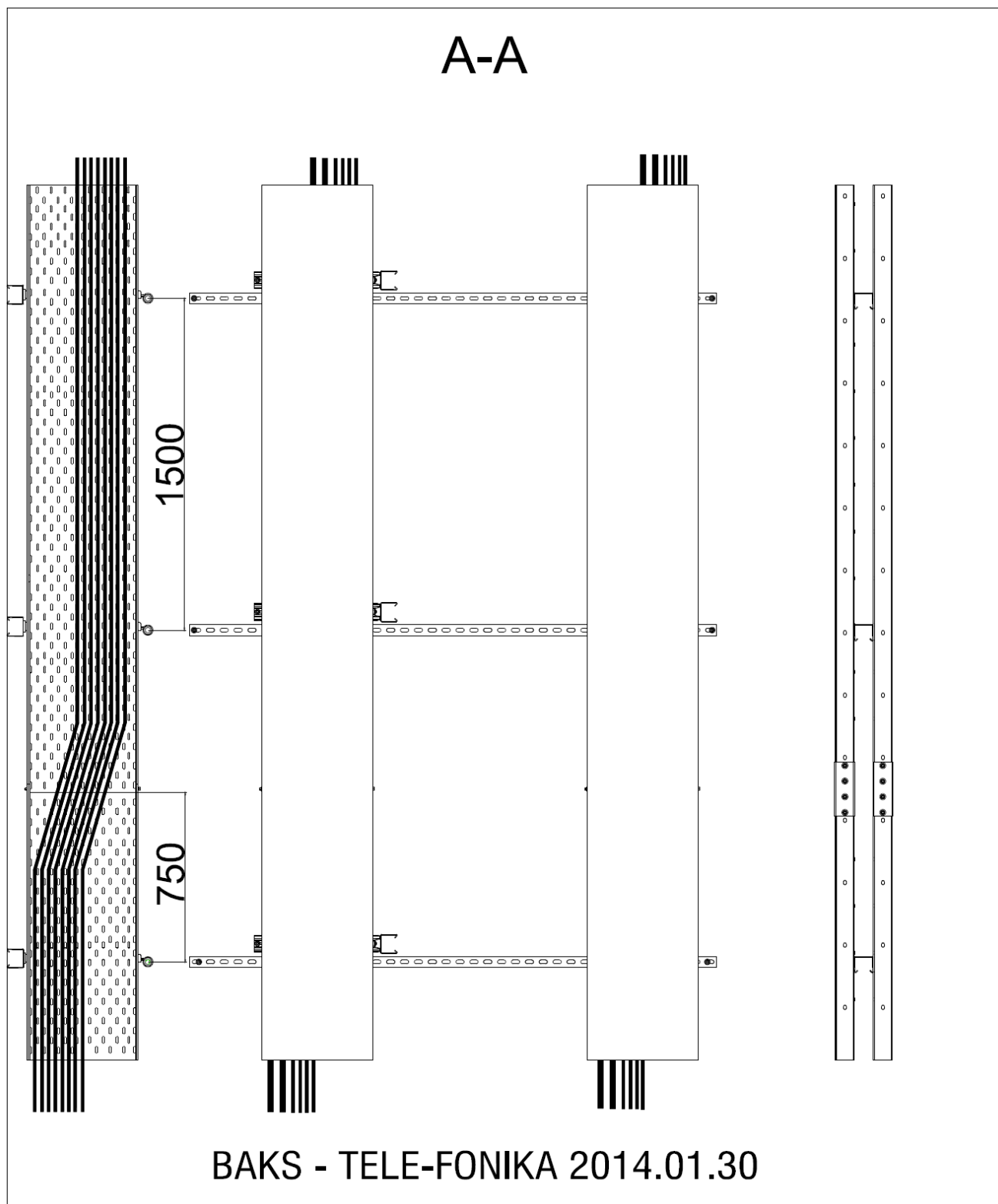
DRAWINGS



5	Śruba	SM M8x16	4
4	Uchwyt trójkątny	UTM/UTMO	4
3	Śruba z łbem grzybkowym	SGNM8x14	4
2	Drabinka	DUP/DUOP400H60/...	2
1	Wspornik sufitowy	WPCW/WPCO500	1
L.p.	Nazwa	Symbol	Szt.



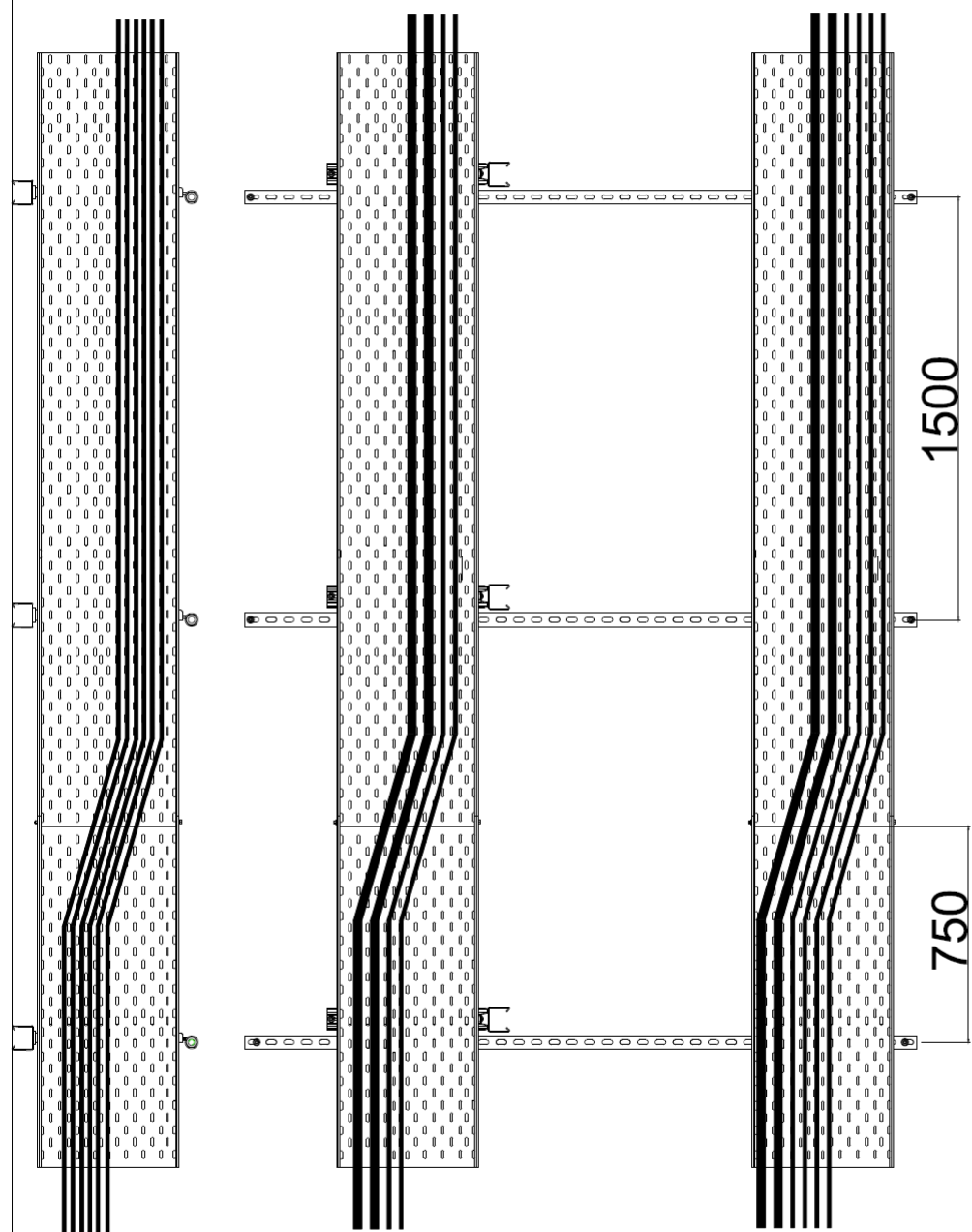
DRAWINGS





DRAWINGS

B-B

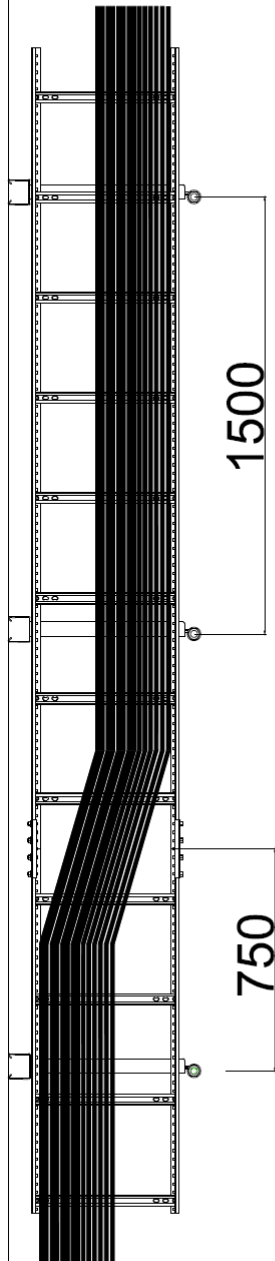


BAKS - TELE-FONIKA 2014.01.30



DRAWINGS

C-C

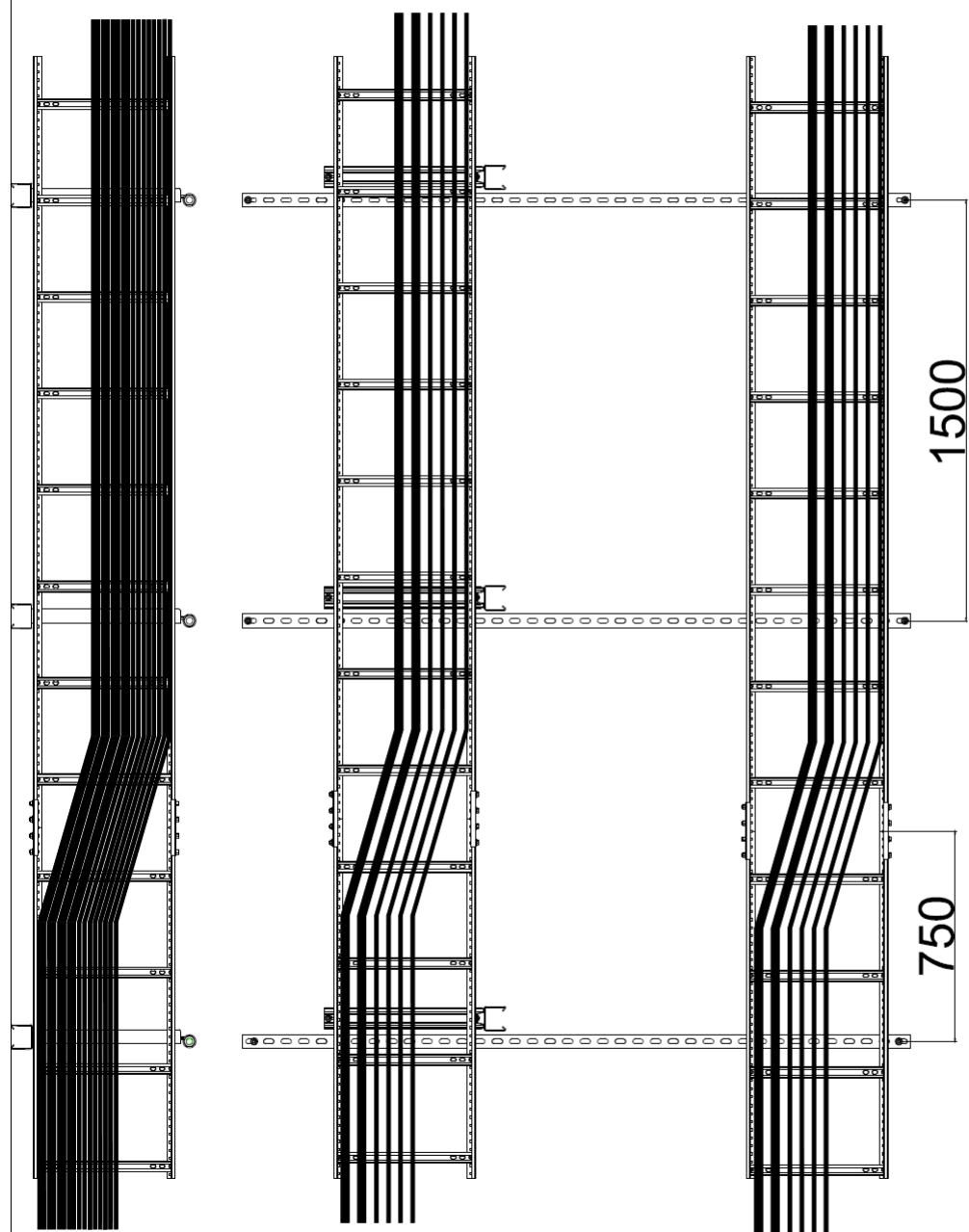


BAKS - TELE-FONIKA 2014.01.30



DRAWINGS

D-D

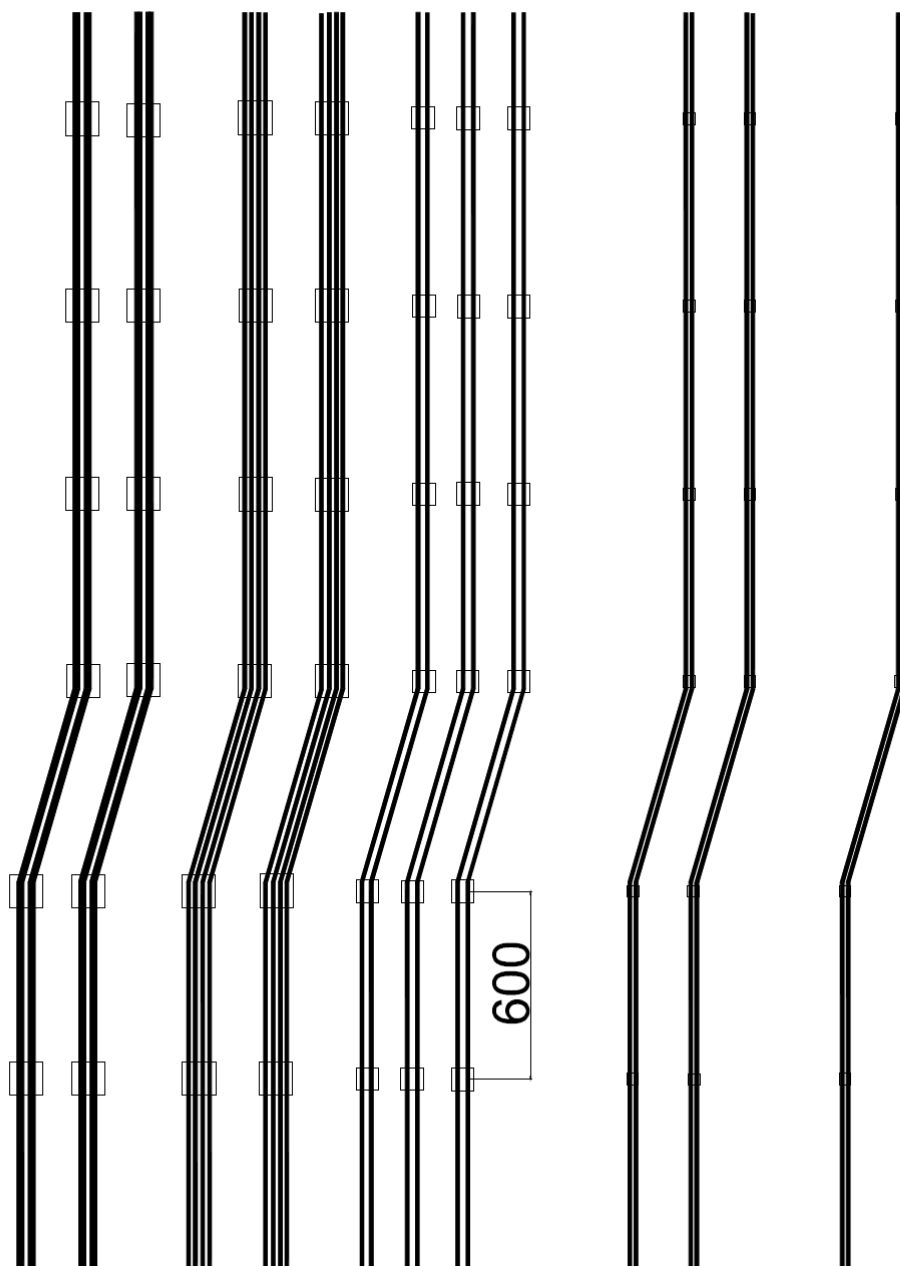


BAKS - TELE-FONIKA 2014.01.30



DRAWINGS

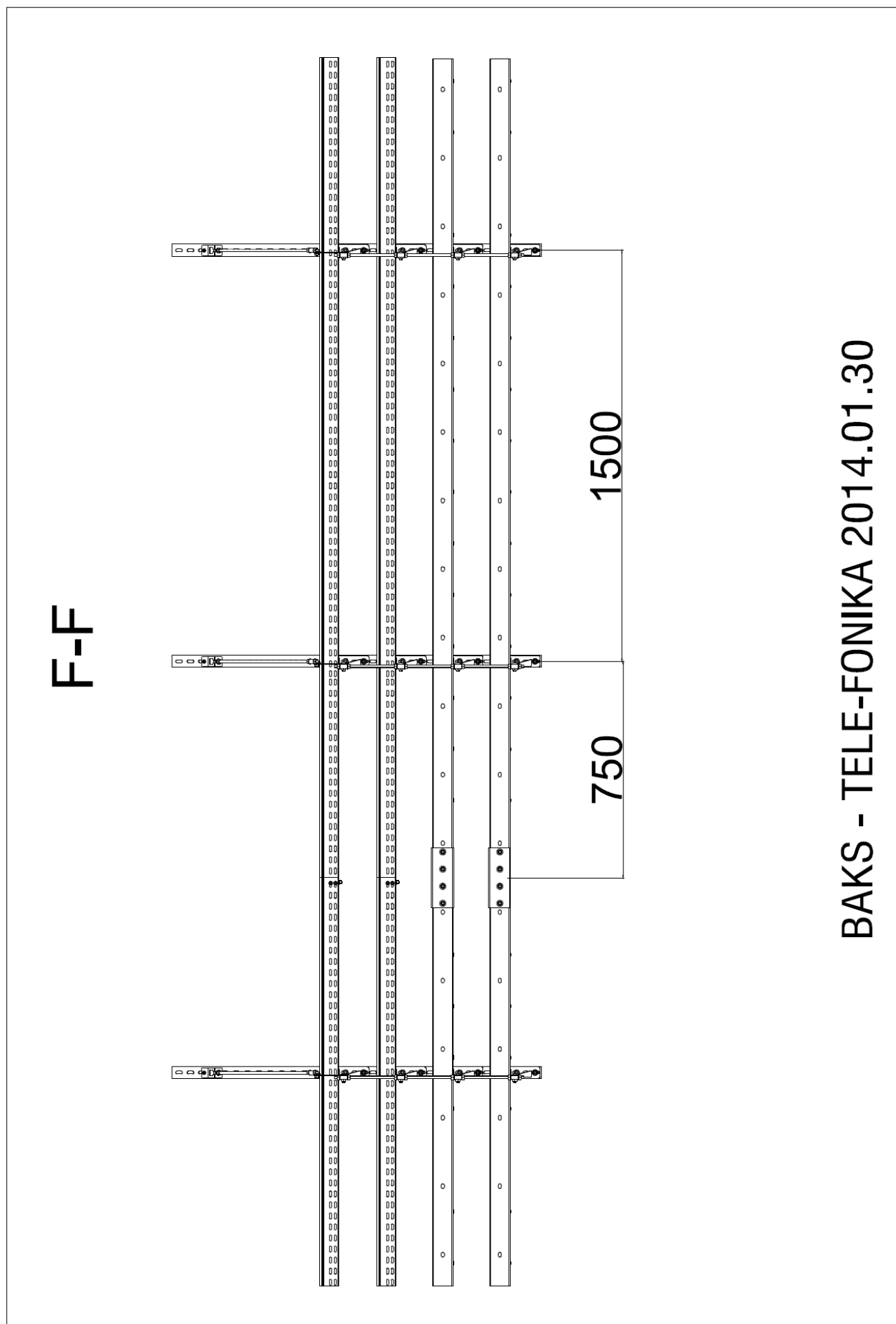
E-E



BAKS - TELE-FONIKA 2014.01.30



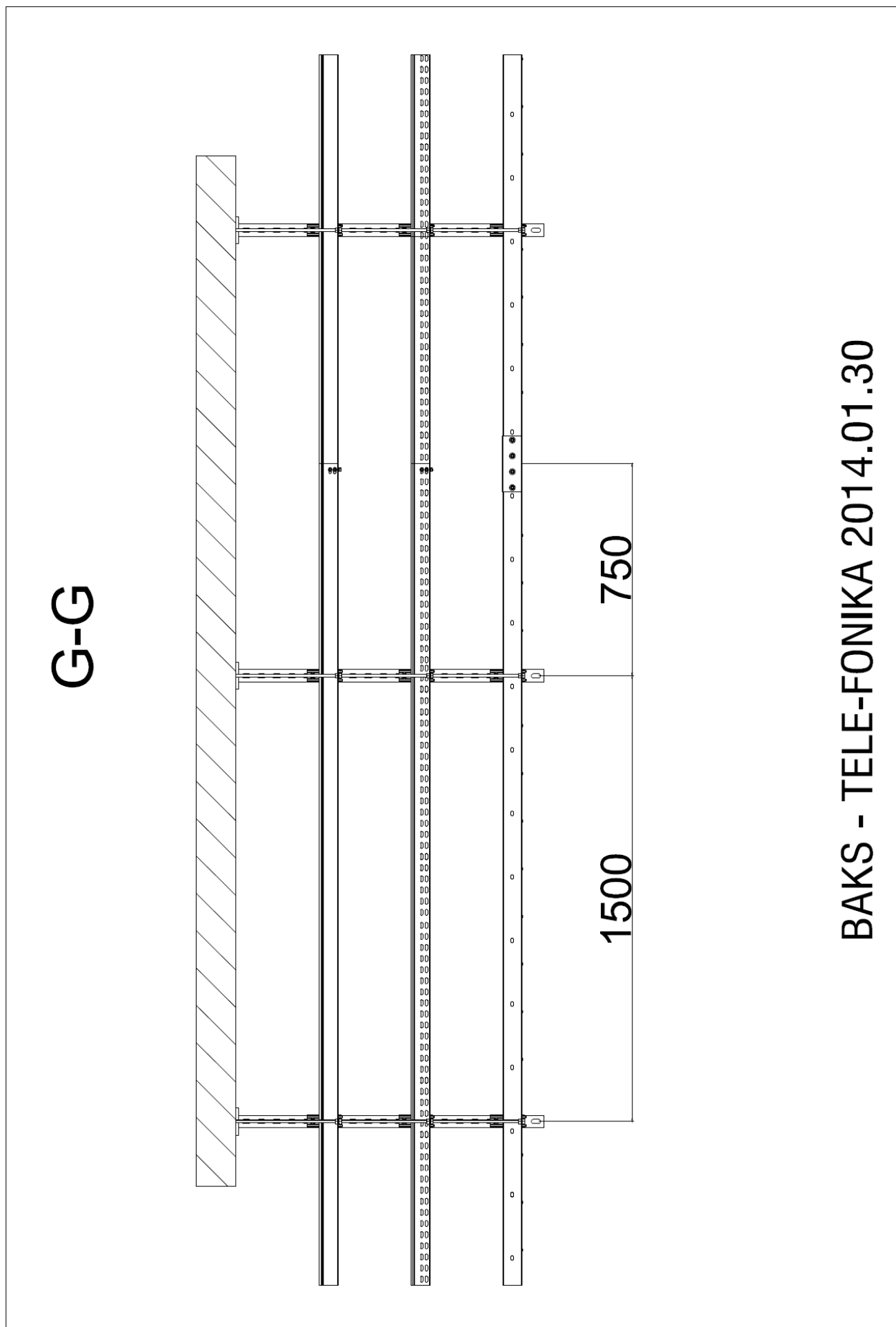
DRAWINGS



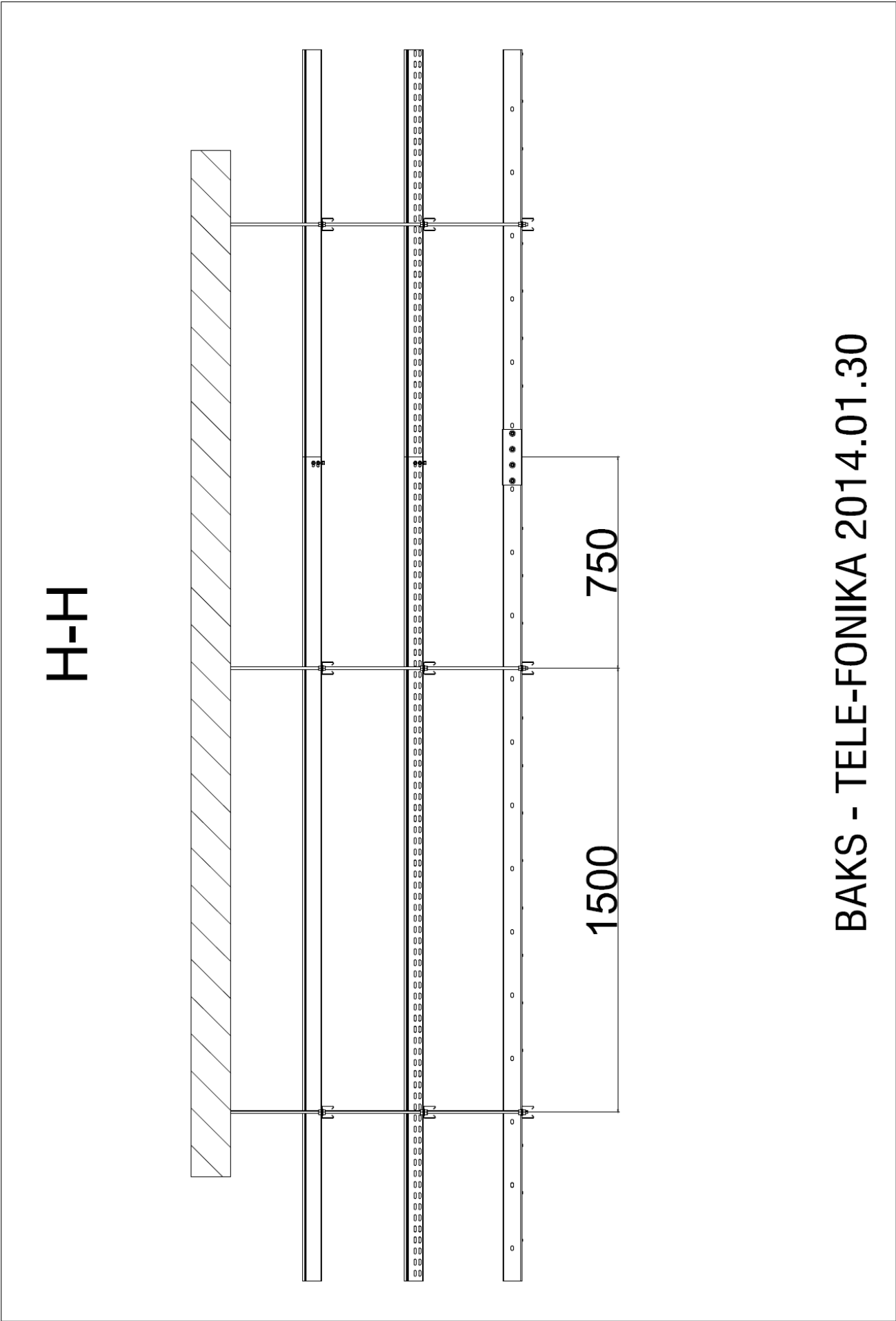
BAKS - TELE-FONIKA 2014.01.30



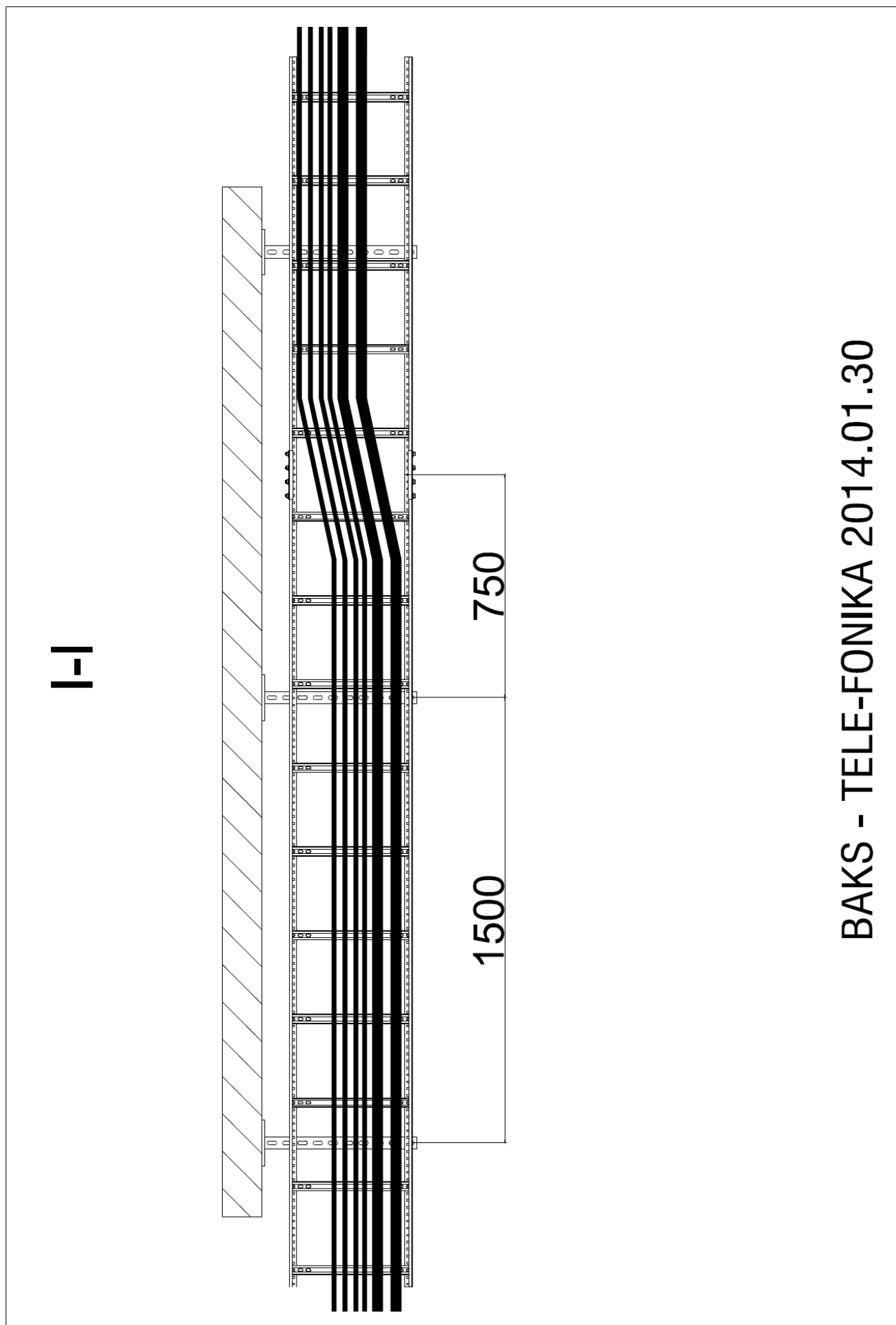
DRAWINGS



BAKS - TELE-FONIKA 2014.01.30

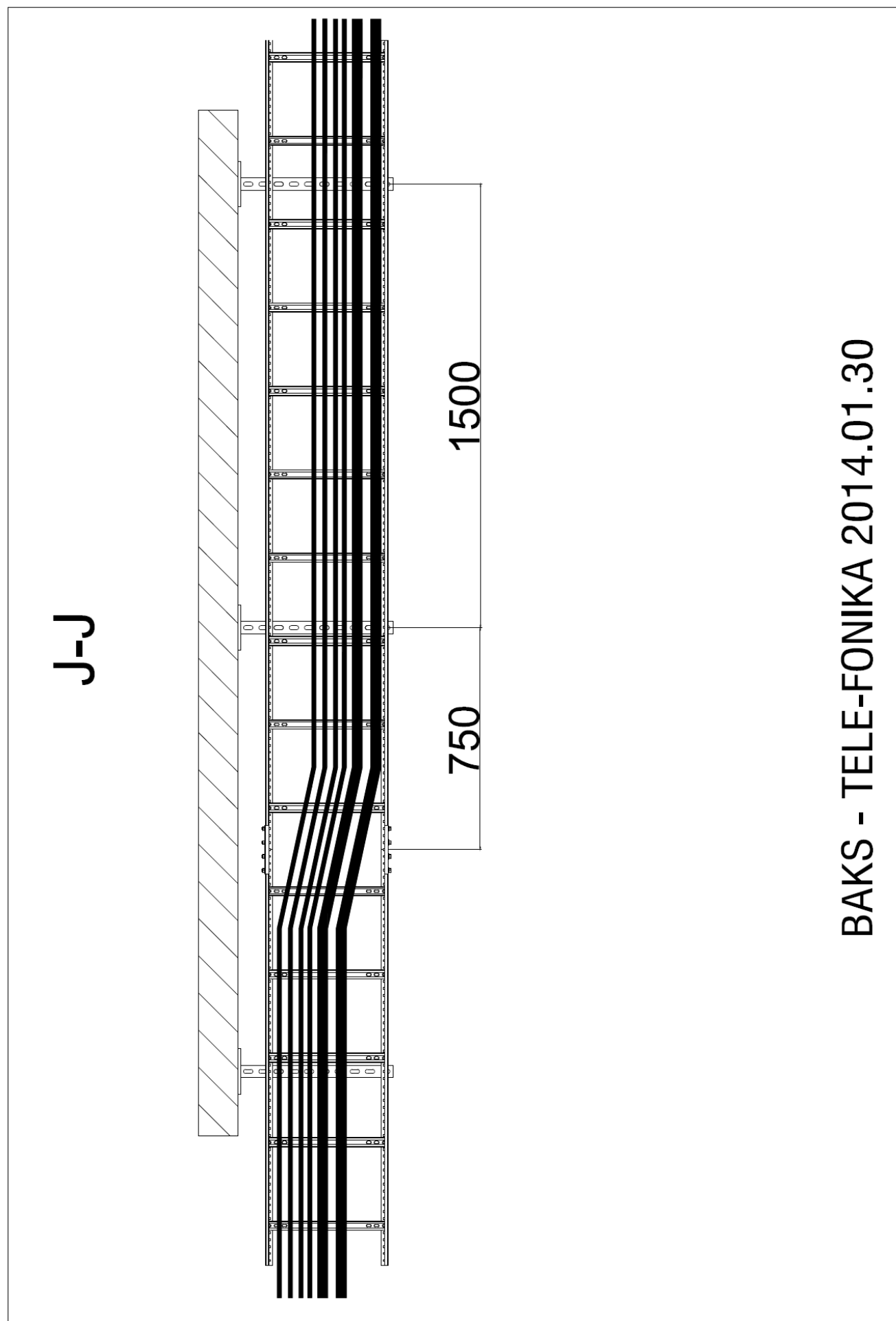


BAKS - TELE-FONIKA 2014.01.30





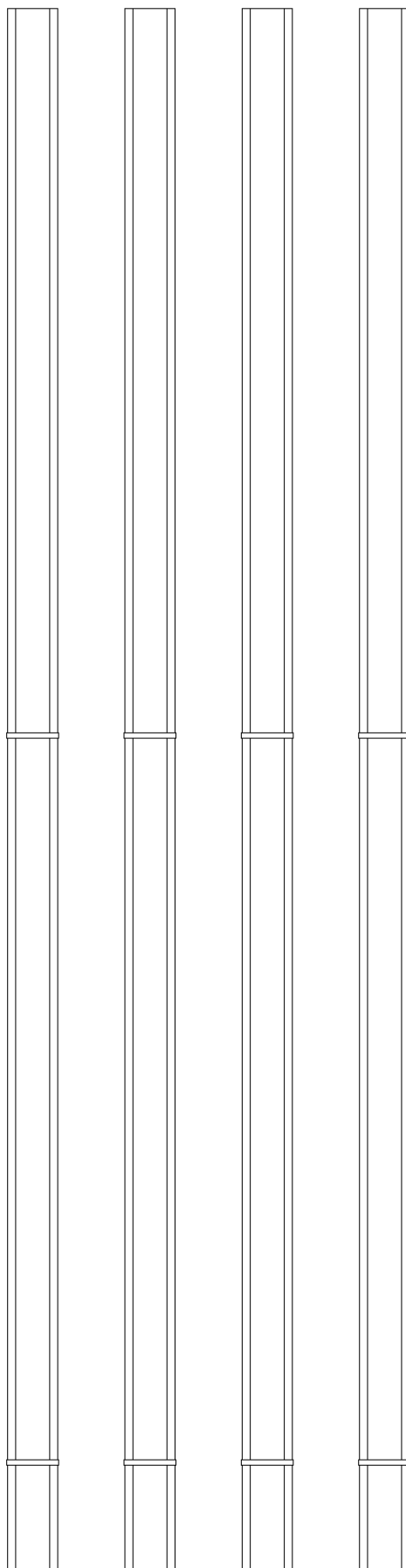
DRAWINGS





DRAWINGS

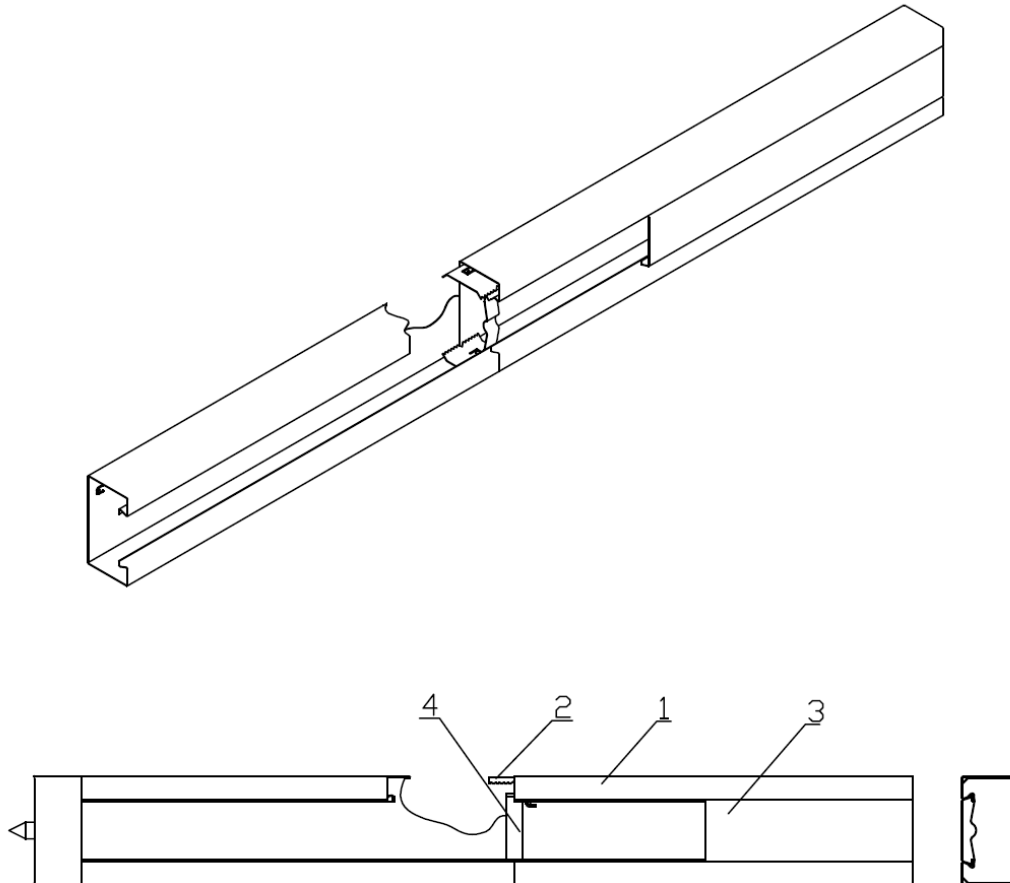
K-K



BAKS - TELE-FONIKA 2014.01.30

DRAWINGS

Typ	Szerokość A(mm)	Długość L(mm)
KS115H68/2	115	2000
KS130H68/2	130	2000
KS170H68/2	170	2000



4	Uchwyt sprężysty	SU		1	
3	Pokrywa kanału	PKS	Stal cynkowana + lakier	2	
2	Łącznik	LKSH68		2	
1	Korytka	KS130H68/2	Stal cynkowana + lakier	2	
L.p.	Nazwa	Symbol	Materiał	Szt.	Nr katalogowy

	Długość wymiarów nieolerowanych	Materiał	Gatunek Nr normy połfabrykat (nr normy)	Masa (kg)	Podziałka	Format	A4
						Arkusz	1
						Arkuszy	1

Projektował	Nazwisko	Podpis	Data	Nazwa rysunku	
Rysował				Potężenie KS130H68/2	
Sprawił				Nr programu maszynowego	Nr zmiany
Zatwierdził				Nr rysunku	

Profesjonalne Systemy
Tras Kablowych



7. FINAL PROVISION

- This report details the method of construction, the test conditions and results obtained when the specific element of construction described herein was following the procedure outlined in EN 1363-1, and where appropriate STN 92 0205:2012. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.
- Because of the nature of the fire resistance testing and consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.
- The test results refer only to the tested subjects. This test report is not an approval of the tested product by the test laboratory or the accreditation body overseeing the laboratory's activities. The test was carried out on testing equipment that is the property of FIRES, s.r.o., Batizovce. Without the written permission of the test laboratory this test report may be copied and/or distributed only as the whole. Any modifications of the test report can be made only by the fire resistance test laboratory FIRES, s.r.o., Batizovce.

Approved by:

Prepared by:

Ing. Štefan Rástocký
leader of the testing laboratory

Bc. Dávid Šubert
technician of the testing laboratory

8. NORMATIVE REFERENCES

EN 1363-1: 2012	Fire resistance tests. Part 1: General requirements
STN 92 0205:2012	Fire behaviour of construction products and building constructions. Circuit integrity maintenance of cable systems. Requirements, testing and classification.
DIN 4102 – 2:1977-09	Fire behaviour of building materials and elements - requirements and testing
DIN 4102 – 12:1998-11	Fire resistance of electric cable systems required to maintain circuit integrity
ZP-27/2008 PAVUS	Test method for determination of functionality class of cables and cable loadbearing constructions - cable circuits in case of fire

THE END OF THE TEST REPORT