

TEST REPORT FIRES-FR-060-13-AUNE

**Cable bearing system and fireboxes BAKS with cables business
ZAKLADY KABLOWE BITNER Celina Bitner**

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TEST REPORT

FIRES-FR-060-13-AUNE

Tested property: Function in fire
STN 92 0205: 2012
Test method: (ZP-27/2008, DIN 4102-12: 1998-11)
Date of issue: 19. 04. 2013

Name of the product: Cable bearing system and fireboxes BAKS with cables business ZAKLADY KABLOWE BITNER Celina Bitner

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

ZAKLADY KABLOWE BITNER Celina Bitner, Friedleina 3/3, 30 009 Kraków, Poland – producer of cables

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

Task No.: PR-13-0117
Specimens received: 15. 04. 2013
Date of the test: 18. 04. 2013

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

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1. INTRODUCTION

This test report contains the results of test carried out by laboratory of FIRES, s.r.o. 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
Mr. Marcin Tokaj	ZAKLADY KABLOWE BITNER
Mr. Kamil Burkacki	Fischerpolska Sp. z o.o.

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, ZAKLADY KABLOWE BITNER Celina Bitner and Fischerpolska Sp. z o.o. 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, cable clips and fireboxes with accessories (consoles, supports, hangers etc.) and power and communication halogen free cables of ZAKLADY KABLOWE BITNER Celina Bitner company.

Cables

Used cables by test:	NHXX 4x1,5RE FE180/E90 0,6/1kV	(12x)
	NHXX 4x50RM FE180/E90 0,6/1kV	(8x)
	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	(6x)
	NHXCH 4x50RM/25 FE180/E90 0,6/1kV	(4x)
	(N)HXX 4x1,5RE FE180/E90 0,6/1kV	(6x)
	(N)HXX 4x6RE FE180/E90 0,6/1kV	(2x)
	(N)HXX 4x50RM FE180/E90 0,6/1kV	(2x)
	(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	(2x)
	(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	(2x)
	HTKSH 1x2x0,8 FE180/PH90/E90 225V	(10x)
	HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	(4x)
	HDGs 2x1,0 FE180/PH90/E90 300/500V	(14x)
	HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	(2x)
	BiTflame AS 1x2x0,8 FE180/PH90/E90 225V	(6x)
	BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V	(4x)
	BiTflame S 2x1,0 FE180/PH90/E90 300/500V	(4x)

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 track No. 1

Track is made of brackets (WW400) fixed to side wall of furnace in spacing of 1500 mm. Hangers (UPWK/UPWKO) are fixed at the end of each bracket. Threaded rods (PG M10) are fixed through the holders to side wall.

Cable mesh trays (KDS/KDSO400H60/3, steel wire Ø 4,5 mm) fixed together by junctions (USSN/USSO). Mesh trays are fixed to supports by junctions (ZS/ZSO) and loaded with 20kg.m⁻¹. Cables were fixed by cable clips (UKZ/UKZO1).

**Suspension tracks No. 2 and 3**

Tracks are made of consoles combined of horizontal supports (CWP/CWOP40H40/05) and two threaded rods (PG M10) fixed to ceiling in spacing of 1500 mm.

Track No. 2:

Cable trays (KGL/KGOL300H60/3, steel sheet thickness 0,7 mm) fixed together by screws (SGK M6x12). Trays are fixed to supports by screws (SGK M6x12) and loaded with 20kg.m⁻¹.

Track No. 3:

Cable trays (KGJ/KGOJ400H60/3, steel sheet thickness 0,9 mm) fixed together by screws (SGK M6x12). Trays are fixed to supports by screws (SGK M6x12) and loaded with 20kg.m⁻¹.

Suspension track No. 4

Track is made of consoles combined of horizontal support (CWP/CWOP40H40/05) and two threaded rods (PG M10) fixed to trapezoidal steel sheet on ceiling by hangers (WT 120) and threaded rods (PG M8) in spacing of 1500 mm.

Cable mesh trays (KDS/KDSO400H60/3, steel wire Ø 4,5 mm) fixed together by junctions (USSN/USSO). Mesh trays are fixed to supports by junctions (ZS/ZSO) and loaded with 20kg.m⁻¹. Cables were fixed by cable clips (UKZ/UKZO1).

Suspension track No. 5

Track is made of consoles combined of horizontal support (CWP/CWOP40H40/05) and two threaded rods (PG M10) fixed to trapezoidal steel sheet on ceiling by hangers (WT 120) and threaded rods (PG M8) in spacing of 1500 mm.

Cable trays (KGJ/KGOJ400H60/3, steel sheet thickness 0,9 mm) fixed together by screws (SGK M6x12). Trays are fixed to supports by screws (SGK M6x12) and loaded with 20kg.m⁻¹. Trays are covered by steel sheet (PKL400/2).

Suspension track No. 6

Track is made of threaded rods (PG M6) fixed to trapezoidal steel sheet by hangers (WT/WT0120) and threaded rods (PG M6) in spacing of 1500 mm.

Cable mesh trays (KDS/KDSO60H60/3, steel wire Ø 4,5 mm) fixed together by junctions (USS/USSO). Mesh trays are fixed to threaded rods by hangers (WKS/WKSO60) and loaded with 2kg.m⁻¹.

Track No. 7

Track is made of cable clips (UDF) fixed to ceiling by dowels (MKR 6 – FMD 6 FISCHER) in spacing of 600 mm.

Track No. 8

Track is made of cable hangers (OZM/OZMO) fixed to ceiling by dowels (MKR 6 – FMD 6 FISCHER) in spacing of 600 mm.

Track No. 9

Track is made of cable hangers (OZS/OZSO) fixed to ceiling by dowels (MKR 6 – FMD 6 FISCHER) in spacing of 600 mm.

Track No. 10

Track is made of wall channels (KS 115H68/2, steel sheet thickness 1,0 mm) fixed to side wall by dowels (FUR10 FISCHER) in spacing of 800 mm.

Track No. 11

Track is made of fireboxes (PMO1 and PMO2) and cable clips (UDF) fixed to ceiling in spacing of 300 mm.

Power and communication halogen free cables were fixed in the cable ladders and mesh trays by steel clips in the points of allowed bending radius. Cables in cable trays were fixed by plastic stripes only.



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	18,6
standard deviation	0,7

Relative air humidity [%]

mean	44,9
standard deviation	1,9

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]
18. 04. 2013	42,4	19,5



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	cable NHXH 4x1,5RE FE180/E90 0,6/1kV	1	109 minutes
2	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		76 minutes
3	cable NHXH 4x50RM FE180/E90 0,6/1kV		120 minutes no failure / interruption
4	cable NHXH 4x50RM FE180/E90 0,6/1kV		120 minutes no failure / interruption
5	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV		120 minutes no failure / interruption
6	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV		120 minutes no failure / interruption
7	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		105 minutes
8	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		120 minutes no failure / interruption
9	cable (N)HXH 4x6RE FE180/E90 0,6/1kV	10	104 minutes
10	cable (N)HXH 4x6RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
11	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
12	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
13	cable (N)HXH 4x50RM FE180/E90 0,6/1kV	7	120 minutes no failure / interruption
14	cable (N)HXH 4x50RM FE180/E90 0,6/1kV		120 minutes no failure / interruption
15	cable NHXH 4x50RM FE180/E90 0,6/1kV		118 minutes
16	cable NHXH 4x50RM FE180/E90 0,6/1kV		118 minutes
17	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		72 minutes
18	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
19	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
20	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
21	cable NHXH 4x50RM FE180/E90 0,6/1kV	3	90 minutes
22	cable NHXH 4x50RM FE180/E90 0,6/1kV		94 minutes
23	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
24	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
25	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	2	69 minutes
26	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		85 minutes
27	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		85 minutes
28	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		78 minutes
29	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	9	120 minutes no failure / interruption
30	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		120 minutes no failure / interruption
31	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
32	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
33	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV	5	120 minutes no failure / interruption
34	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV		120 minutes no failure / interruption
35	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		120 minutes no failure / interruption
36	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		120 minutes no failure / interruption



Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
37	cable NHXH 4x50RM FE180/E90 0,6/1kV	4	120 minutes no failure / interruption
38	cable NHXH 4x50RM FE180/E90 0,6/1kV		120 minutes no failure / interruption
39	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		91 minutes
40	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		116 minutes
41	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV	6	67 minutes
42	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		71 minutes
43	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		98 minutes
44	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		120 minutes no failure / interruption
52	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	1	120 minutes no failure / interruption
53	2 cables BiTflame S 2x1,0 FE180/PH90/E90 300/500V	10	120 minutes no failure / interruption
54	2 cables BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		120 minutes no failure / interruption
55	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		120 minutes no failure / interruption
56	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		120 minutes no failure / interruption
57	2 cables BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V	3	100 minutes
58	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		120 minutes no failure / interruption
59	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		120 minutes no failure / interruption
60	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	2	120 minutes no failure / interruption
61	2 cables BiTflame S 2x1,0 FE180/PH90/E90 300/500V		120 minutes no failure / interruption
62	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	8	120 minutes no failure / interruption
63	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		120 minutes no failure / interruption
64	2 cables BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		120 minutes no failure / interruption
65A	cable HDGs 2x1,0 FE180/PH90/E90 300/500V + fireboxes PMO1	11	120 minutes no failure / interruption
65B	cable HDGs 2x1,0 FE180/PH90/E90 300/500V + fireboxes PMO2		103 minutes
66	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	5	120 minutes no failure / interruption
67	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		120 minutes no failure / interruption
68	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		47 minutes
69	2 cables BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V	4	97 minutes
70	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		94 minutes
71	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		93 minutes
72	2 cables BiTflame AS 1x2x0,8 FE180/PH90/E90 225V	6	120 minutes no failure / interruption
73	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		104 minutes

The fire test was discontinued in 122nd minute at the request of test sponsor.

Specimens S1 – S44 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
 Specimens S52 – S73 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	22,5	23,7	22,9	23,5	25,0	25,8	25,0	25,7	24,3	20,0	19,5	0,0	17,9
5	533,9	602,8	589,4	557,5	541,0	587,3	556,2	560,5	566,1	576,0	19,6	-3,4	19,0
10	610,9	685,2	695,0	655,6	611,0	688,1	671,9	679,1	662,1	678,0	19,6	-1,9	19,4
15	672,5	742,3	742,0	717,7	660,3	740,9	745,1	751,8	721,6	739,0	19,7	-2,0	18,0
20	721,4	781,7	788,7	790,3	699,3	779,5	789,2	799,4	768,7	781,0	19,7	-2,0	18,2
25	765,5	821,0	830,4	831,0	713,7	822,7	832,5	839,9	811,2	815,0	19,8	-1,8	19,3
30	808,8	855,1	862,4	866,1	797,0	872,3	869,1	878,7	851,2	842,0	19,8	-1,3	17,3
35	834,7	873,4	876,5	870,2	831,1	894,0	887,0	893,2	870,0	865,0	19,9	-1,0	19,5
40	860,9	898,6	897,9	884,3	854,4	915,3	904,5	908,5	890,6	885,0	19,9	-0,7	18,2
45	882,2	918,5	897,4	878,3	889,6	934,9	906,9	901,0	901,1	902,0	20,0	-0,6	19,8
50	897,7	924,2	905,6	890,6	909,3	942,9	918,1	913,3	912,7	918,0	20,0	-0,6	18,4
55	907,7	937,9	930,7	911,4	912,6	951,4	944,1	937,4	929,2	932,0	20,1	0,6	17,7
60	920,3	954,3	952,5	932,0	922,2	956,9	964,1	955,7	944,8	945,0	20,1	-0,5	17,8
65	936,2	969,6	971,5	948,7	937,0	971,3	979,0	972,2	960,7	957,0	20,2	-0,5	19,1
70	952,3	981,2	981,8	962,1	951,7	989,8	990,8	992,2	975,2	968,0	20,2	-0,4	18,3
75	968,5	987,5	988,1	974,2	965,9	1005,1	997,6	992,8	985,0	979,0	20,3	-0,3	19,6
80	979,4	998,4	1000,4	983,6	977,1	1012,1	1008,6	1004,9	995,6	988,0	20,3	-0,2	19,3
85	980,2	998,6	1016,0	995,9	990,6	1007,5	1017,7	1013,2	1002,5	997,0	20,4	-0,2	18,5
90	993,9	1010,0	1025,7	1006,5	1003,1	1019,4	1026,8	1022,5	1013,5	1006,0	20,5	-0,1	18,8
95	1020,9	1017,3	1017,8	1006,1	1019,8	1046,5	1016,5	1014,4	1019,8	1014,0	20,5	-0,1	19,0
100	1031,7	1021,4	1026,4	1014,1	1032,2	1054,8	1026,4	1026,3	1029,2	1022,0	20,5	0,0	19,4
105	1041,6	1027,7	1032,2	1021,5	1048,8	1060,9	1033,9	1034,5	1037,6	1029,0	20,6	0,0	19,7
110	1028,4	1026,7	1036,6	1030,1	1049,4	1055,8	1039,4	1041,4	1038,5	1036,0	20,7	0,0	18,8
115	1032,5	1036,7	1040,2	1034,1	1055,3	1061,7	1044,9	1046,2	1044,0	1043,0	20,7	0,0	19,5
120	1038,3	1043,5	1047,0	1040,6	1060,6	1066,6	1051,3	1052,4	1050,0	1049,0	20,8	0,0	19,1
121	1039,8	1043,6	1047,4	1041,3	1062,1	1068,1	1051,6	1053,1	1050,9	1050,0	20,8	0,0	17,0

Tave Average temperature in the test furnace calculated from plate thermometers

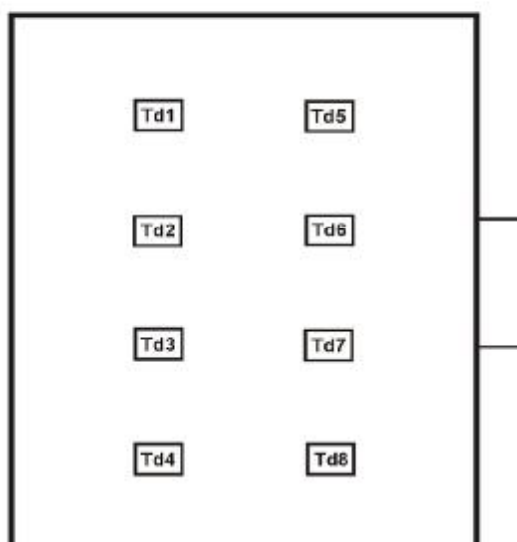
Tn Standard temperature in the test furnace laid down to test guideline

To Ambient temperature

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

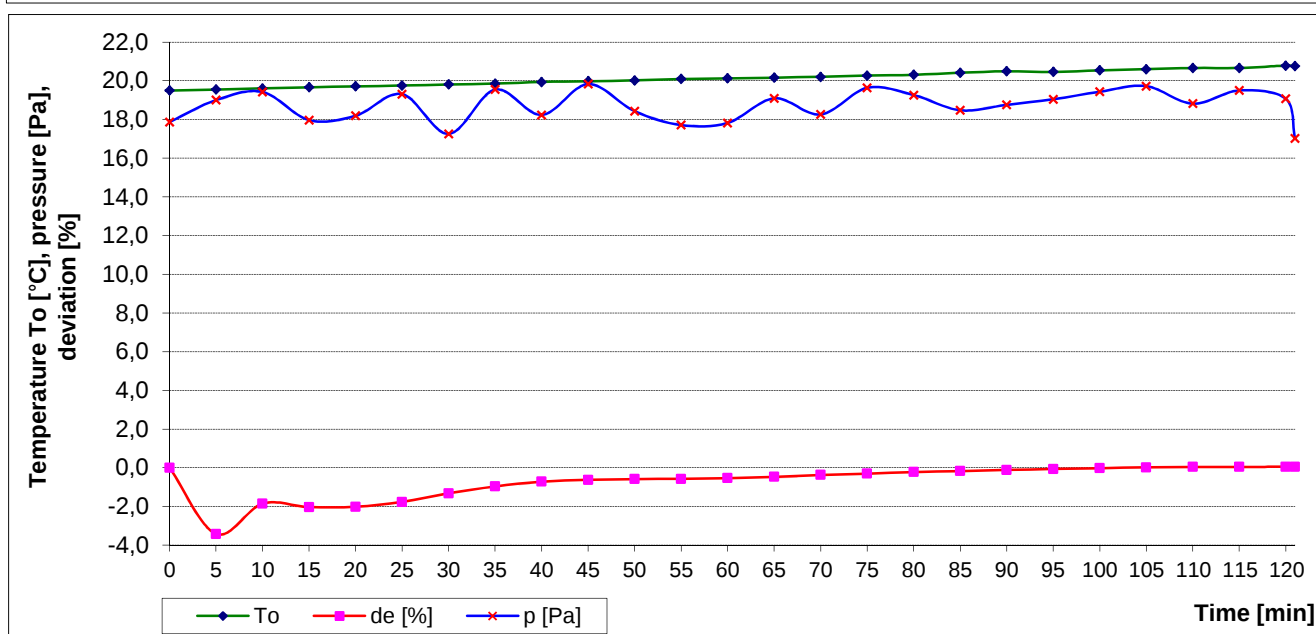
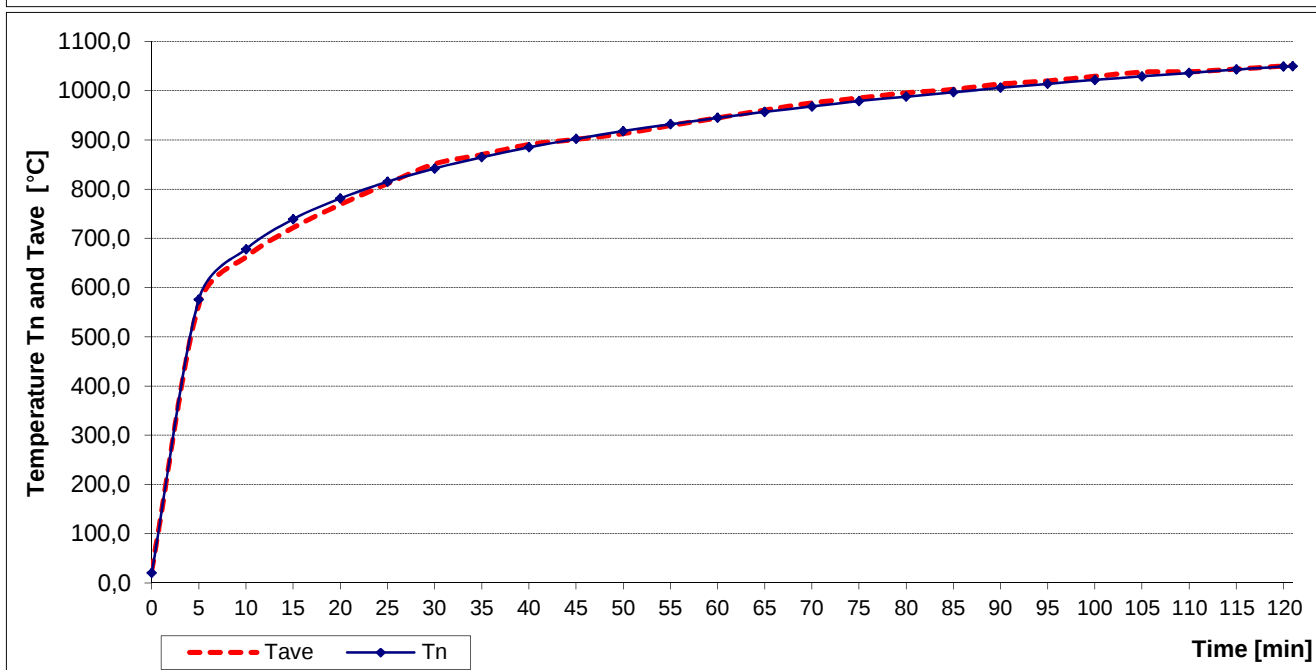
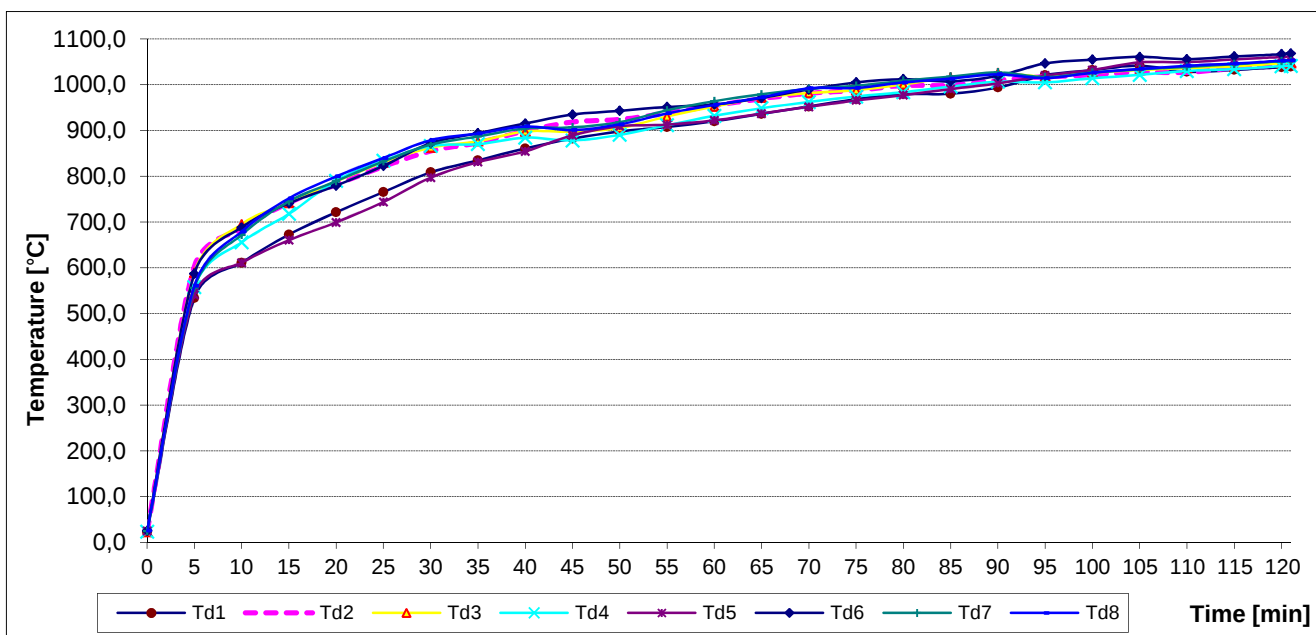
p Pressure inside the test furnace measured under the ceiling of the test furnace

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	x
	2-L2	x
	3-L3	109:27
	4-PEN	x
S2	5-L1	76:23
	6-L2	x
	7-L3	x
	8-PEN	x
S3	9-L1	no failure / interruption
	10-L2	no failure / interruption
	11-L3	no failure / interruption
	12-PEN	no failure / interruption
S4	13-L1	no failure / interruption
	14-L2	no failure / interruption
	15-L3	no failure / interruption
	16-PEN	no failure / interruption
S5	17-L1	no failure / interruption
	18-L2	no failure / interruption
	19-L3	no failure / interruption
	20-PEN	no failure / interruption
S6	21-L1	no failure / interruption
	22-L2	no failure / interruption
	23-L3	no failure / interruption
	24-PEN	no failure / interruption
S7	25-L1	x
	26-L2	105:38
	27-L3	x
	28-PEN	x
S8	29-L1	no failure / interruption
	30-L2	no failure / interruption
	31-L3	no failure / interruption
	32-PEN	no failure / interruption
S9	33-L1	x
	34-L2	104:18
	35-L3	x
	36-PEN	x
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	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
2	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
3	cable NHXH 4x50RM FE180/E90 0,6/1kV
4	cable NHXH 4x50RM FE180/E90 0,6/1kV
5	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV
6	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV
7	cable NHXCH 4x1,5RE/25 FE180/E90 0,6/1kV
8	cable NHXCH 4x1,5RE/25 FE180/E90 0,6/1kV
9	cable (N)HXH 4x6RE FE180/E90 0,6/1kV
10	cable (N)HXH 4x6RE FE180/E90 0,6/1kV

- 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	no failure / interruption
	50-L2	no failure / interruption
	51-L3	no failure / interruption
	52-PEN	no failure / interruption
S14	53-L1	no failure / interruption
	54-L2	no failure / interruption
	55-L3	no failure / interruption
	56-PEN	no failure / interruption
S15	57-L1	x
	58-L2	x
	59-L3	118:08
	60-PEN	x
S16	61-L1	118:08
	62-L2	x
	63-L3	x
	64-PEN	x
S17	65-L1	72:59
	66-L2	72:59
	67-L3	x
	68-PEN	x
S18	69-L1	no failure / interruption
	70-L2	no failure / interruption
	71-L3	no failure / interruption
	72-PEN	no failure / interruption
S19	73-L1	no failure / interruption
	74-L2	no failure / interruption
	75-L3	no failure / interruption
	76-PEN	no failure / interruption
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	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
12	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
13	cable (N)HXH 4x50RM FE180/E90 0,6/1kV
14	cable (N)HXH 4x50RM FE180/E90 0,6/1kV
15	cable NHXH 4x50RM FE180/E90 0,6/1kV
16	cable NHXH 4x50RM FE180/E90 0,6/1kV
17	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
18	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
19	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
20	cable NHXH 4x1,5RE FE180/E90 0,6/1kV

- 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	90:30
	82-L2	90:30
	83-L3	x
	84-PEN	x
S22	85-L1	x
	86-L2	94:13
	87-L3	x
	88-PEN	x
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	69:30
	98-L2	x
	99-L3	x
	100-PEN	x
S26	101-L1	x
	102-L2	x
	103-L3	85:53
	104-PEN	x
S27	105-L1	85:44
	106-L2	85:44
	107-L3	85:44
	108-PEN	x
S28	109-L1	x
	110-L2	x
	111-L3	78:40
	112-PEN	x
S29	113-L1	no failure / interruption
	114-L2	no failure / interruption
	115-L3	no failure / interruption
	116-PEN	no failure / interruption
S30	117-L1	no failure / interruption
	118-L2	no failure / interruption
	119-L3	no failure / interruption
	120-PEN	no failure / interruption

Specimen No.	Cables
21	cable NHXH 4x50RM FE180/E90 0,6/1kV
22	cable NHXH 4x50RM FE180/E90 0,6/1kV
23	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
24	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
25	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV
26	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV
27	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
28	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
29	cable NHXCH 4x1,5RE/25 FE180/E90 0,6/1kV
30	cable NHXCH 4x1,5RE/25 FE180/E90 0,6/1kV

- 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	x
	154-L2	91:04
	155-L3	x
	156-PEN	x
S40	157-L1	116:02
	158-L2	x
	159-L3	x
	160-PEN	x

Specimen No.	Cables
31	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
32	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
33	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV
34	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV
35	cable NHXCH 4x1,5RE/25 FE180/E90 0,6/1kV
36	cable NHXCH 4x1,5RE/25 FE180/E90 0,6/1kV
37	cable NHXH 4x50RM FE180/E90 0,6/1kV
38	cable NHXH 4x50RM FE180/E90 0,6/1kV
39	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
40	cable NHXH 4x1,5RE FE180/E90 0,6/1kV

- 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 S41 to S44 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S41	161-L1	x
	162-L2	x
	163-L3	67:39
	164-PEN	x
S42	165-L1	x
	166-L2	x
	167-L3	71:13
	168-PEN	x
S43	169-L1	x
	170-L2	98:10
	171-L3	x
	172-PEN	x
S44	173-L1	no failure / interruption
	174-L2	no failure / interruption
	175-L3	no failure / interruption
	176-PEN	no failure / interruption

Specimen No.	Cables
41	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
42	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
43	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
44	cable NHXH 4x1,5RE FE180/E90 0,6/1kV

- 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 specimen S52 to S61 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S52A	209-L	no failure / interruption
	210-PEN	no failure / interruption
S52B	211-L	no failure / interruption
	212-PEN	no failure / interruption
S53A	213-L	no failure / interruption
	214-PEN	no failure / interruption
S53B	215-L	no failure / interruption
	216-PEN	no failure / interruption
S54A	217-L	no failure / interruption
	218-PEN	no failure / interruption
S54B	219-L	no failure / interruption
	220-PEN	no failure / interruption
S55A	221-L	no failure / interruption
	222-PEN	no failure / interruption
S55B	223-L	no failure / interruption
	224-PEN	no failure / interruption
S56A	225-L	no failure / interruption
	226-PEN	no failure / interruption
S56B	227-L	no failure / interruption
	228-PEN	no failure / interruption
S57A	229-L	no failure / interruption
	230-PEN	no failure / interruption
S57B	231-L	100:54
	232-PEN	x
S58A	233-L	no failure / interruption
	234-PEN	no failure / interruption
S58B	235-L	no failure / interruption
	236-PEN	no failure / interruption
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	no failure / interruption
	242-PEN	no failure / interruption
S60B	243-L	no failure / interruption
	244-PEN	no failure / interruption
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 HDGs 2x1,0 FE180/PH90/E90 300/500V
53	2 cables BITflame S 2x1,0 FE180/PH90/E90 300/500V
54	2 cables BITflame AS 1x2x0,8 FE180/PH90/E90 225V
55	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V
56	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V
57	2 cables BITflame AS(St) 1x2x0,8 FE180/PH90/E90 225V
58	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V
59	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V
60	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V
61	2 cables BITflame S 2x1,0 FE180/PH90/E90 300/500V

- 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 from S62 to S71 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S62A	249-L	no failure / interruption
	250-PEN	no failure / interruption
S62B	251-L	no failure / interruption
	252-PEN	no failure / interruption
S63A	253-L	no failure / interruption
	254-PEN	no failure / interruption
S63B	255-L	no failure / interruption
	256-PEN	no failure / interruption
S64A	257-L	no failure / interruption
	258-PEN	no failure / interruption
S64B	259-L	no failure / interruption
	260-PEN	no failure / interruption
S65A	261-L	no failure / interruption
	262-PEN	no failure / interruption
S65B	263-L	103:37
	264-PEN	x
S66A	265-L	no failure / interruption
	266-PEN	no failure / interruption
S66B	267-L	no failure / interruption
	268-PEN	no failure / interruption
S67A	269-L	no failure / interruption
	270-PEN	no failure / interruption
S67B	271-L	no failure / interruption
	272-PEN	no failure / interruption
S68A	273-L	108:14
	274-PEN	x
S68B	275-L	47:19
	276-PEN	x
S69A	273-L	97:19
	274-PEN	x
S69B	275-L	110:30
	276-PEN	x
S70A	281-L	94:28
	282-PEN	x
S70B	283-L	98:00
	284-PEN	x
S71A	285-L	x
	286-PEN	93:44
S71B	287-L	x
	288-PEN	100:25

Specimen No.	Cables
62	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V
63	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V
64	2 cables BITflame AS 1x2x0,8 FE180/PH90/E90 225V
65 A	cable HDGs 2x1,0 FE180/PH90/E90 300/500V + fireboxes PMO1
65 B	cable HDGs 2x1,0 FE180/PH90/E90 300/500V + fireboxes PMO2
66	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V
67	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V
68	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V
69	2 cables BITflame AS(St) 1x2x0,8 FE180/PH90/E90 225V
70	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V
71	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V

- 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 S73 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S72A	289-L	no failure / interruption
	290-PEN	no failure / interruption
S72B	291-L	no failure / interruption
	292-PEN	no failure / interruption
S73A	293-L	no failure / interruption
	294-PEN	no failure / interruption
S73B	295-L	104:39
	296-PEN	x

Specimen No.	Cables
72	2 cables BiTflame AS 1x2x0,8 FE180/PH90/E90 225V
73	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V

- 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.



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

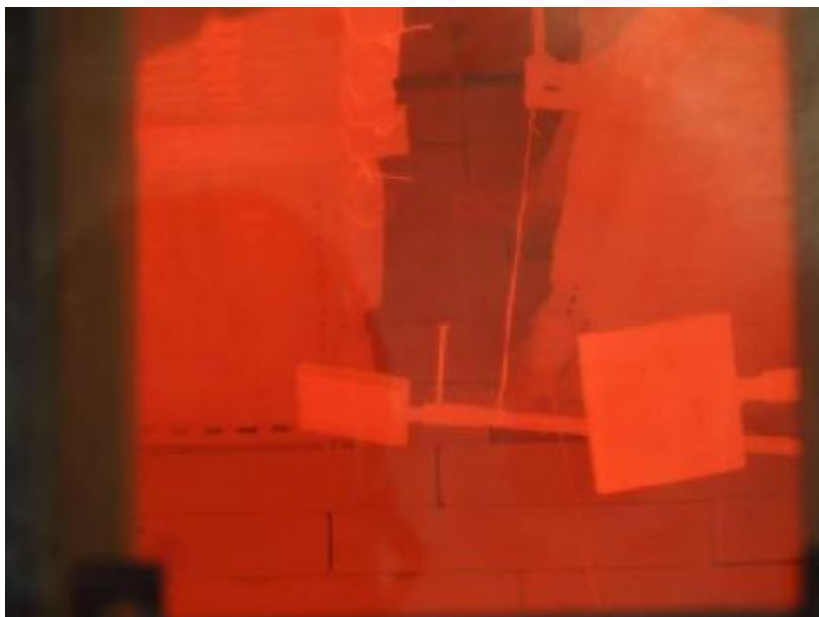


Photo taken during the test.

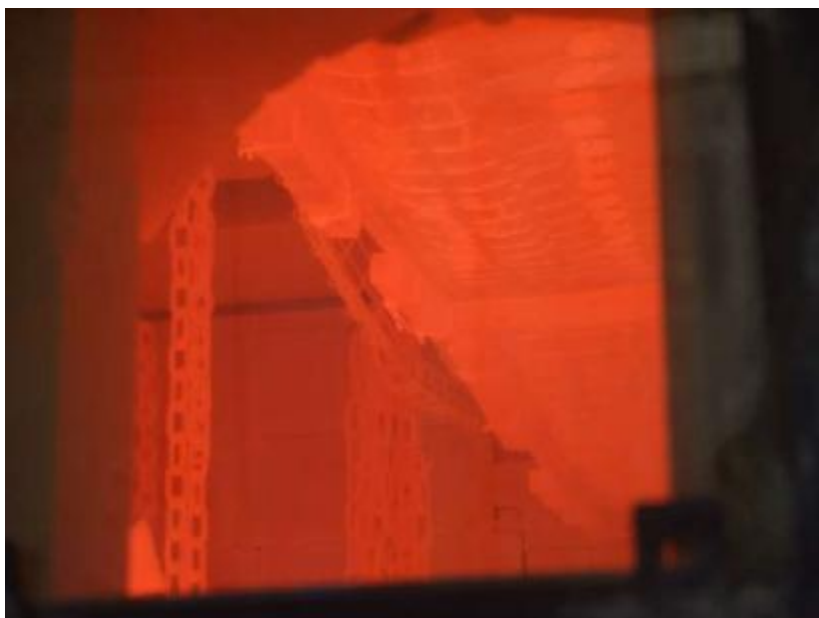


Photo taken during the test.

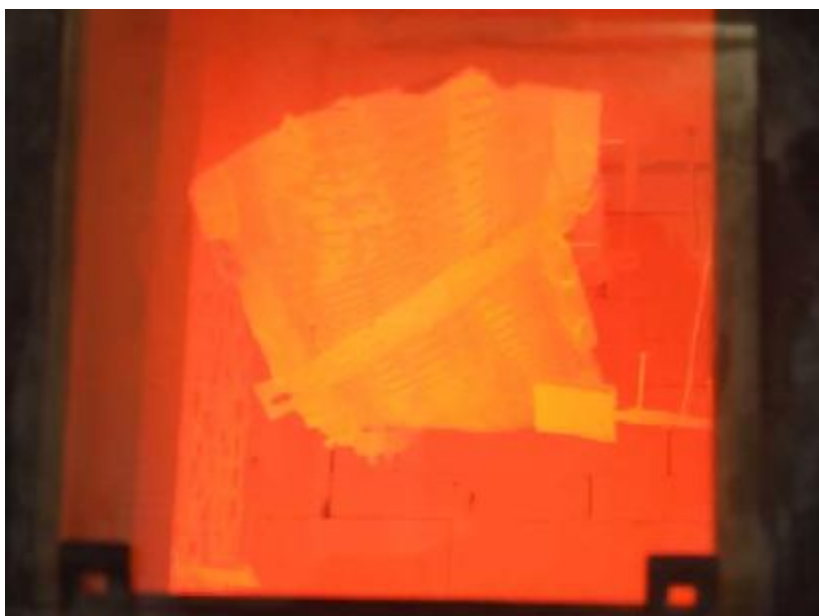


Photo taken during the test.



PHOTOS



Photo taken after the test.



Photo taken after the test.



Photo taken after the test.



PHOTOS



Photo taken after the test.



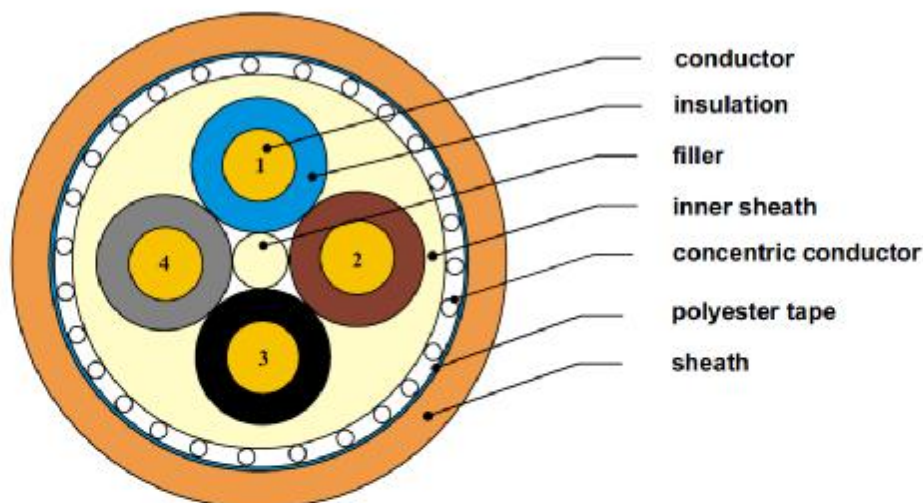
Photo taken after the test.



Photo taken after the test.



CABLES

(N)HXCH FE180/E90**FIRE RESISTANT HALOGEN FREE POWER CABLES****APPLICATIONS**

Safety cables are used in all locations where a special protection against fire and fire damage is necessary for human life and equipment and where strict safety regulations have to be met and where large emergency running time is necessary. They may be used indoor and outdoor, but not directly in earth and water. They are considered as protectively insulated.

CONSTRUCTION

conductor - bare copper, solid or stranded acc. to DIN VDE 0295

insulation - cross-linked halogen free ceramic forming polymer compound acc. to DIN VDE 0266

filler - flame resistant, halogen free polymer compound

inner sheath - flame resistant, halogen free polymer compound

concentric conductor - formed by bare copper wires with counter copper tape

polyester tape

sheath - flame resistant, halogen free polymer compound acc. to DIN VDE 0276-604

(N)HXCH FE180/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm ²
1 + 4	1,5/1,5 + 240/120
7	1,5/1,5 + 4/4
10 + 30	1,5/2,5 + 2,5/10

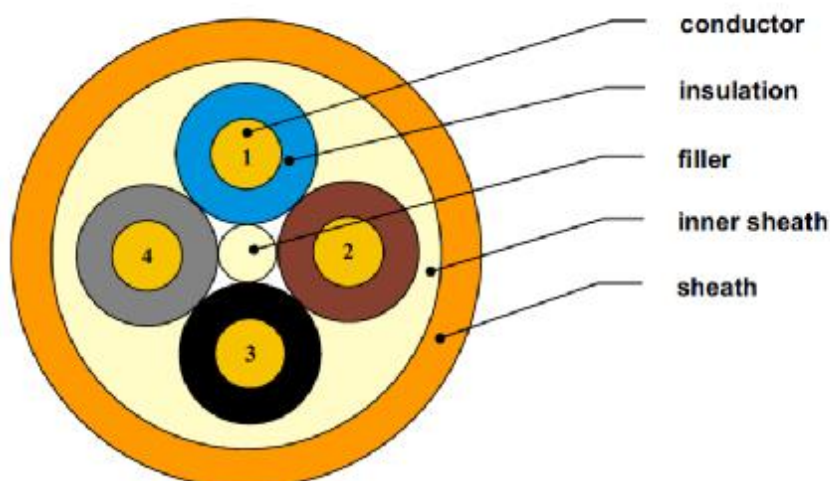
Operating voltage 0,6/1 kV
 Voltage test 4000 V, 50 Hz
 Insulation resistivity at 90°C, minimum 10^{12}

Operating temperature range during operation during installation -30°C up to +90°C
 -5°C up to +50°C
 Minimum bending radius
 15 x D single core
 12 x D multi core
 D = outer diameter

Cable combustibility
 Fire resistance E90
 Combustibility tests PN-EN 50226:2006, IEC 60332-3
 Reference standards DIN VDE 0266



CABLES

(N)HXH FE180/E90**FIRE RESISTANT HALOGEN FREE POWER CABLES****APPLICATIONS**

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CONSTRUCTION

conductor - bare copper, solid or stranded acc. to DIN VDE 0295

insulation - cross-linked halogen free ceramic forming polymer compound acc. to DIN VDE 0266

filler - flame resistant, halogen free polymer compound

inner sheath - flame resistant, halogen free polymer compound

sheath - flame resistant, halogen free polymer compound acc. to DIN VDE 0276-604

(N)HXH FE180/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm ²
1 + 5	1,5 + 300
7 + 10	1,5 + 10
10 + 48	1,5 + 2,5

Operating voltage

0,6/1kV

Voltage test

4000 V, 50 Hz

Insulation resistivity at 90°C,
minimum10¹²Operating temperature range
during operation
during installation-30°C up to +90°C
-5°C up to +50°C

Minimum bending radius

15 x D single core
12 x D multi core
D = outer diameter

Cable combustibility

Fire resistance

E90

Combustibility tests

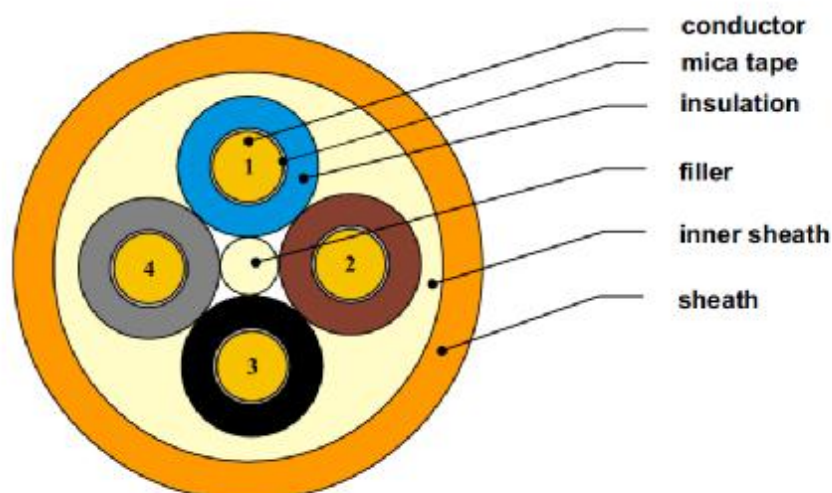
PN-EN 50226:2006, IEC 60332-3

Reference standards

DIN VDE 0266



CABLES

NHXX FE180/E90**FIRE RESISTANT HALOGEN FREE POWER CABLES****APPLICATIONS**

Safety cables are used in all locations where a special protection against fire and fire damage is necessary for human life and equipment and where strict safety regulations have to be met and where large emergency running time is necessary. They may be used indoor and outdoor, but not directly in earth and water. They are considered as protectively insulated.

CONSTRUCTION

conductor - bare copper, solid or stranded acc. to DIN VDE 0295

insulation - mica tape and cross-linked halogen free forming polymer compound acc. to DIN VDE 0266

filler - flame resistant, halogen free polymer compound

inner sheath - flame resistant, halogen free polymer compound

sheath - flame resistant, halogen free polymer compound acc. to DIN VDE 0276-604

NHXX FE180/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm ²
1 ÷ 5	1,5 + 300
7 ÷ 10	1,5 + 10
10 ÷ 48	1,5 + 2,5

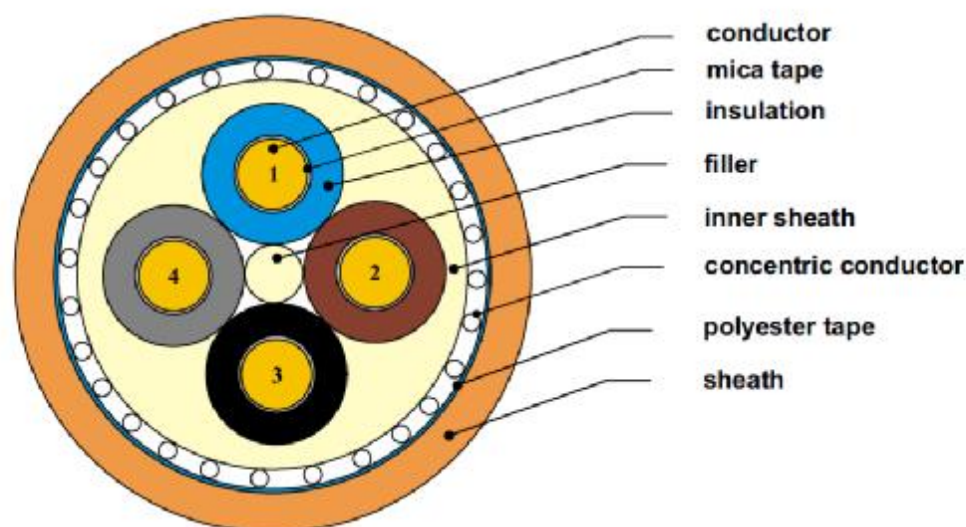
Operating voltage 0,6/1kV
 Voltage test 4000 V, 50 Hz
 Insulation resistivity at 90°C, minimum 10^{12}

Operating temperature range during operation during installation -30°C up to +90°C
 -5°C up to +50°C
 Minimum bending radius
 15 x D single core
 12 x D multi core
 D = outer diameter

Cable combustibility
 Fire resistance E90
 Combustibility tests PN-EN 50226:2006, IEC 60332-3
 Reference standards DIN VDE 0266



CABLES

NHXCH FE180/E90**FIRE RESISTANT HALOGEN FREE POWER CABLES****APPLICATIONS**

Safety cables are used in all locations where a special protection against fire and fire damage is necessary for human life and equipment and where strict safety regulations have to be met and where large emergency running time is necessary. They may be used indoor and outdoor, but not directly in earth and water. They are considered as protectively insulated.

CONSTRUCTION

conductor - bare copper, solid or stranded acc. to DIN VDE 0295

insulation - mica tape and cross-linked halogen free forming polymer compound acc. to DIN VDE 0266

filler - flame resistant, halogen free polymer compound

inner sheath - flame resistant, halogen free polymer compound

concentric conductor - formed by bare copper wires with counter copper tape

polyester tape

sheath - flame resistant, halogen free polymer compound acc. to DIN VDE 0276-604

NHXCH FE180/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm ²
1 + 4	1,5/1,5 + 240/120
7	1,5/1,5 + 4/4
10 + 30	1,5/2,5 + 2,5/10

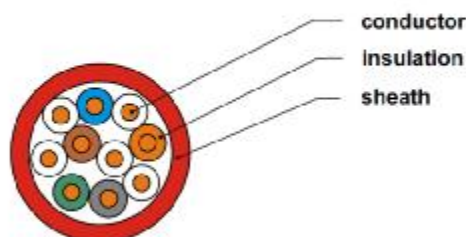
Operating voltage 0,6/1 kV
 Voltage test 4000 V, 50 Hz
 Insulation resistivity at 90°C, minimum 10^{12}

Operating temperature range during operation during installation -30°C up to +90°C
 -5°C up to +50°C
 Minimum bending radius 15 x D single core
 12 x D multi core
 D = outer diameter

Cable combustibility
 Fire resistance E90
 Combustibility tests PN-EN 50226:2006, IEC 60332-3
 Reference standards DIN VDE 0266



CABLES

HTKSH FE180/PH90/E90**FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMMUNICATIONS CABLE****APPLICATIONS**

Safety installations cables are used for the transmission signals and measuring data in control circuits, in locations where a particular protection against fire and fire damage for human life and equipment is necessary.

Installation cables are not admissible for power installation purposes and direct burial.

CONSTRUCTION

conductor - bare copper, solid acc. to PN-EN 60228

insulation - mica tape and halogen free forming polymer compound

sheath - flame resistant, halogen free polymer compound

HTKSH FE180/PH90/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor diameter
n	mm
1 x 2 x 20 x 2 x	0,8
1 x 2 x 10 x 2 x	1,0
1 x 2 x 10 x 2 x	1,4
1 x 2 x 10 x 2 x	1,8
1 x 2 x 10 x 2 x	2,3
1 x 2 x 10 x 2 x	2,8

Operating voltage 225V
Voltage test 1500 V, 50 Hz
core/core

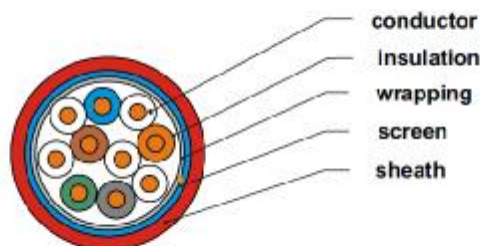
Insulation resistivity at 90°C,
minimum 10¹¹

Operating temperature range
during operation -30°C up to +80°C
during installation -5°C up to +50°C
Minimum bending radius 10 x D single core
D = outer diameter

Cable combustibility
Fire resistance E90
Combustibility tests PN-EN 50200, PN-EN 50226:2006
IEC 60332-3
Reference standards ZN-CB-25-2005



CABLES

HTKSHekw FE180/PH90/E90**FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMMUNICATIONS CABLE****APPLICATIONS**

Safety installations cables are used for the transmission signals and measuring data in control circuits, in locations where a particular protection against fire and fire damage for human life and equipment is necessary.

Installation cables are not admissible for power installation purposes and direct burial.

CONSTRUCTION

conductor - bare copper, solid acc. to PN-EN 60228

insulation - mica tape and halogen free forming polymer compound

wrapping - polyester tape

screen - static screen of plastic coated metal foil with a solid, tinned drain wire

sheath - flame resistant, halogen free polymer compound

HTKSHekw FE180/PH90/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor diameter
n	mm
1 x 2 x 20 x 2 x	0,8
1 x 2 x 10 x 2 x	1,0
1 x 2 x 10 x 2 x	1,4
1 x 2 x 10 x 2 x	1,8
1 x 2 x 10 x 2 x	2,3
1 x 2 x 10 x 2 x	2,8

Operating voltage 225V
Voltage test 1500 V, 50 Hz
core/core

Insulation resistivity at 90°C,
minimum 10¹¹

Operating temperature range
during operation -30°C up to +80°C
during installation -5°C up to +50°C
Minimum bending radius

10 x D single core
D = outer diameter

Cable combustibility

Fire resistance

Combustibility tests

Reference standards

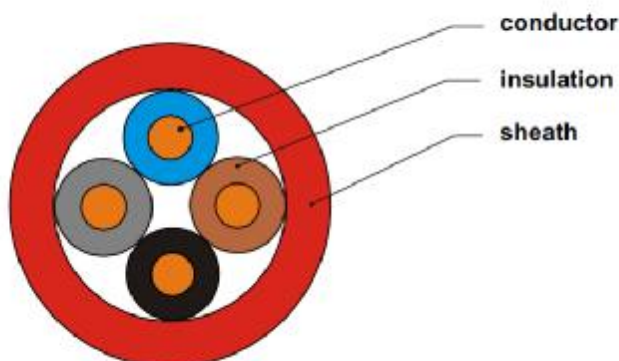
E90
PN-EN 50200, PN-EN 50226:2006
IEC 60332-3
ZN-CB-25-2005



CABLES

HDGs FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE POWER AND CONTROL CABLE



APPLICATIONS

Halogen-free fire resistant cables are designed for installation in places where it is necessary to ensure operation of devices under fire conditions. There are recommended for emergency lighting installations, smoke extraction systems, alarm systems, signalling systems, sound warning and control systems, fire alarm signaling and automation and other safety ensuring circuits.

CONSTRUCTION

conductor - bare copper, solid acc. to PN-EN 60228

insulation - cross-linked halogen free ceramic forming polymer compound

sheath - flame resistant, halogen free polymer compound

HDGs FE180/PH90/E90

CHARACTERISTICS

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm ²
2 + 5	1 + 10
6 + 37	1 + 2,5

Operating voltage 300/500 V

Voltage test 2000 V, 50 Hz

core/core 2000 V, 50 Hz

core/screen 2000 V, 50 Hz

Insulation resistivity at 90°C, minimum 10¹¹

Operating temperature range

during operation -30°C up to +80°C

during installation -10°C up to +50°C

Minimum bending radius 10 x D single core
D = outer diameter

Cable combustibility

Fire resistance

Combustibility tests

Reference standards

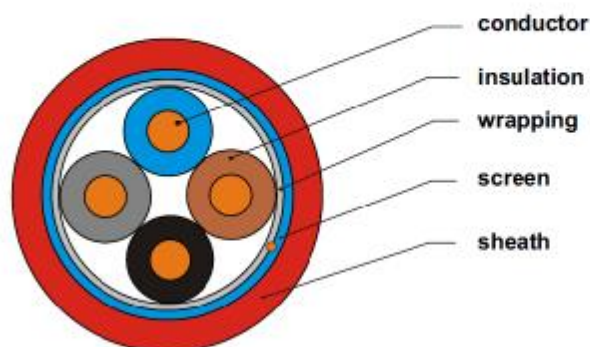
E90

PN-EN 50200, PN-EN 50226:2006
IEC 60332-3

ZN-CB-03-2002



CABLES

HDGsekwf FE180/PH90/E90**FIRE RESISTANT HALOGEN FREE POWER AND CONTROL CABLE****APPLICATIONS**

Halogen-free fire resistant cables are designed for installation in places where it is necessary to ensure operation of devices under fire conditions. There are recommended for emergency lighting installations, smoke extraction systems, alarm systems, signalling systems, sound warning and control systems, fire alarm signaling and automation and other safety ensuring circuits.

CONSTRUCTION

conductor - bare copper, solid acc. to PN-EN 60228

insulation - cross-linked halogen free ceramic forming polymer compound

wrapping - polyester tape

screen - static screen of plastic coated metal foil with tinned copper drain wire

sheath - flame resistant, halogen free polymer compound

HDGsekwf FE180/PH90/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm ²
2 ÷ 5	1 ÷ 10
6 ÷ 37	1 ÷ 2,5

Operating voltage 300/500 V

Voltage test 2000 V, 50 Hz

core/core 2000 V, 50 Hz

core/screen 2000 V, 50 Hz

Insulation resistivity at 90°C,
minimum 10¹¹

Operating temperature range

during operation

during installation

Minimum bending radius

-30°C up to +80°C

-10°C up to +50°C

10 x D single core

D = outer diameter

Cable combustibility

Fire resistance

Combustibility tests

Reference standards

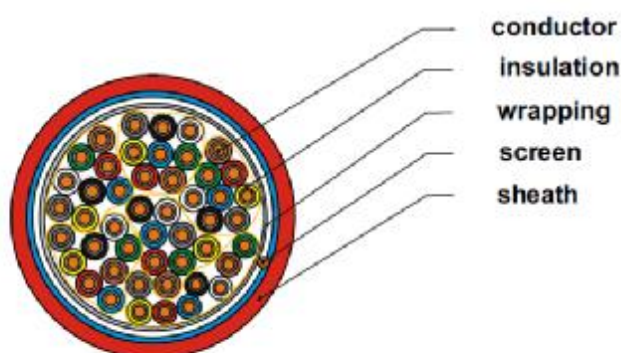
E90

PN-EN 50200, PN-EN 50226:2006
IEC 60332-3

ZN-CB-03-2002



CABLES

JE-H(St)H MIKA FE180/E90**FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMMUNICATIONS CABLE****APPLICATIONS**

Safety installations cables are used for the transmission of signals and measuring data in control circuits, in locations where a particular protection against fire and fire damage for human life and equipment is necessary.

Installation cables are not admissible for power installation purposes and direct burial.

CONSTRUCTION

conductor - bare copper, solid acc. to DIN VDE 0295

insulation - mica tape and cross-linked halogen free forming polymer compound acc. to DIN VDE 0207-23

wrapping - polyester and glass-fibre tape

screen - static screen of plastic coated metal foil with a solid, tinned drain wire

sheath - flame resistant, halogen free polymer compound acc. to DIN VDE 0207-5

JE-H(St)H MIKA FE180/E90**CHARACTERISTICS**

Conductor diameter	
Number of conductors	Nominal conductor diameter
n	mm
1 x 2 x 80 x 2 x	0,8
1 x 2 x 80 x 2 x	1,0

Operating voltage 225V

Voltage test
core/core 500 V, 50 Hz
core/screen 2000 V, 50 Hz

Insulation resistivity at 90°C,
minimum 10^{12}

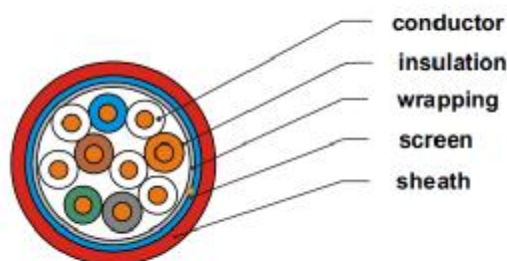
Operating temperature range
during operation -25°C up to +80°C
during installation -5°C up to +50°C

Minimum bending radius
8 x D single core
D = outer diameter

Cable combustibility
Fire resistance E90
Combustibility tests PN-EN 50226:2006, IEC 60332-3
Reference standards DIN VDE 0815



CABLES

BiT flame AS(St) FE180/PH90/E90**FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMMUNICATIONS CABL****APPLICATIONS**

Safety installations cables are used for the transmission signals and measuring data in control circuits, in locations where a particular protection against fire and fire damage for human life and equipment is necessary.
Installation cables are not admissible for power installation purposes and direct burial.

CONSTRUCTION

conductor - bare copper, solid acc. to PN-EN 60228

insulation - mica tape and halogen free forming polymer compound

wrapping - polyester tape

screen - static screen of plastic coated metal foil with a solid, tinned drain wire

sheath - flame resistant, halogen free polymer compound

BiT flame AS(St) FE180/PH90/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor diameter
n	mm
1 x 2 x ... 20 x 2 x ...	0,8
1 x 2 x ... 10 x 2 x ...	1,0
1 x 2 x ... 10 x 2 x ...	1,4
1 x 2 x ... 10 x 2 x ...	1,8
1 x 2 x ... 10 x 2 x ...	2,3
1 x 2 x ... 10 x 2 x ...	2,8

Operating voltage 225V
Voltage test 1500 V, 50 Hz
core/core

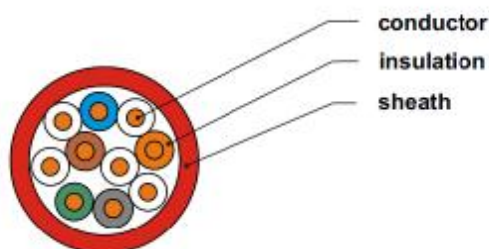
Insulation resistivity at 90°C,
minimum 10¹¹

Operating temperature range
during operation -30°C up to +80°C
during installation -5°C up to +50°C
Minimum bending radius 10 x D single core
D = outer diameter

Cable combustibility E90
Fire resistance
Combustibility tests PN-EN 50200, PN-EN 50226:2006
IEC 60332-3
Reference standards ZN CB 25 2005



CABLES

BiT flame AS FE180/PH90/E90**FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMMUNICATIONS CABLE****APPLICATIONS**

Safety installations cables are used for the transmission signals and measuring data in control circuits, in locations where a particular protection against fire and fire damage for human life and equipment is necessary.

Installation cables are not admissible for power installation purposes and direct burial.

CONSTRUCTION

conductor - bare copper, solid acc. to PN-EN 60228

insulation - mica tape and halogen free forming polymer compound

sheath - flame resistant, halogen free polymer compound

BiT flame AS FE180/PH90/E90**CHARACTERISTICS**

Conductor cross-section	
Number of conductors	Nominal conductor diameter
n	mm
1 x 2 x 20 x 2 x	0,8
1 x 2 x 10 x 2 x	1,0
1 x 2 x 10 x 2 x	1,4
1 x 2 x 10 x 2 x	1,8
1 x 2 x 10 x 2 x	2,3
1 x 2 x 10 x 2 x	2,8

Operating voltage 225V
Voltage test 1500 V, 50 Hz
core/core

Insulation resistivity at 90°C,
minimum 10¹¹

Operating temperature range
during operation -30°C up to +80°C
during installation -5°C up to +50°C

Minimum bending radius 10 x D single core
D = outer diameter

Cable combustibility E90
Fire resistance
Combustibility tests PN-EN 50200, PN-EN 50226:2006
IEC 60332-3
Reference standards ZN-CB-25-2005



DRAWINGS

Nr	Nr Fires	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
1	8	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	1	Korytko siatkowe KDS/ KDSO 400H60/... B-400 1.5 m /20kg/m / grubość drutu fi 4,5 mm Mocowanie : Wyścięgnik WW400 pręt gwintowany PG M10 za pomocą uchwytu kątownego WKPO
2	7	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
3	6	NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
4	5	NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
5	4	NHXH 4x50RM FE180/E90 0,6/1kV		
6	3	NHXH 4x50RM FE180/E90 0,6/1kV		
7	2	NHXH 4x1,5RE FE180/E90 0,6/1kV		
8	1	NHXH 4x1,5RE FE180/E90 0,6/1kV		
9	52	HDGs 2x1,0 FE180/PH90/E90 300/500V		
10		HDGs 2x1,0 FE180/PH90/E90 300/500V		
11	28	(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	2	Korytko kablowe KGL/KGOL 300H60/... B-300 1.5 m /20kg/m / grubość blachy 0,7 mm Mocowanie : Ceownik CWP/CWOP40H40/05, pręt gwintowany PG M10
12	27	(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
13	26	(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		
14	25	(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		
15	61	BiTflame S 2x1,0 FE180/PH90/E90 300/500V		
16		BiTflame S 2x1,0 FE180/PH90/E90 300/500V		
17	60	HTKSH 1x2x0,8 FE180/PH90/E90 225V		
18		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
19	24	NHXH 4x1,5RE FE180/E90 0,6/1kV	3	Korytko kablowe KGJ/KGOJ 400H60/... B-400 1.5 m /20kg/m / grubość blachy 0,9 mm Mocowanie : Ceownik CWP/CWOP40H40/05, pręt gwintowany PG M10
20	23	NHXH 4x1,5RE FE180/E90 0,6/1kV		
21	22	NHXH 4x50RM FE180/E90 0,6/1kV		
22	21	NHXH 4x50RM FE180/E90 0,6/1kV		
23	59	HTKSH 1x2x0,8 FE180/PH90/E90 225V		
24		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
25	58	HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V		
26		HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V		
27	57	BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V		
28		BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V		
29	40	NHXH 4x1,5RE FE180/E90 0,6/1kV	4	Korytko siatkowe KDS/ KDSO 400H60/... B-400 1.5 m /20kg/m / grubość drutu fi 4,5 mm Mocowanie : Ceownik CWP/CWOP40H40/05, pręt gwintowany PG M10. Wieszak trapezowy WT 120 + pręt gwintowany PG M8 mocowany do blachy trapezowej
30	39	NHXH 4x1,5RE FE180/E90 0,6/1kV		
31	38	NHXH 4x50RM FE180/E90 0,6/1kV		
32	37	NHXH 4x50RM FE180/E90 0,6/1kV		
33	71	HDGs 2x1,0 FE180/PH90/E90 300/500V		
34		HDGs 2x1,0 FE180/PH90/E90 300/500V		
35	70	HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
36		HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
37	69	BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V		
38		BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V		



DRAWINGS

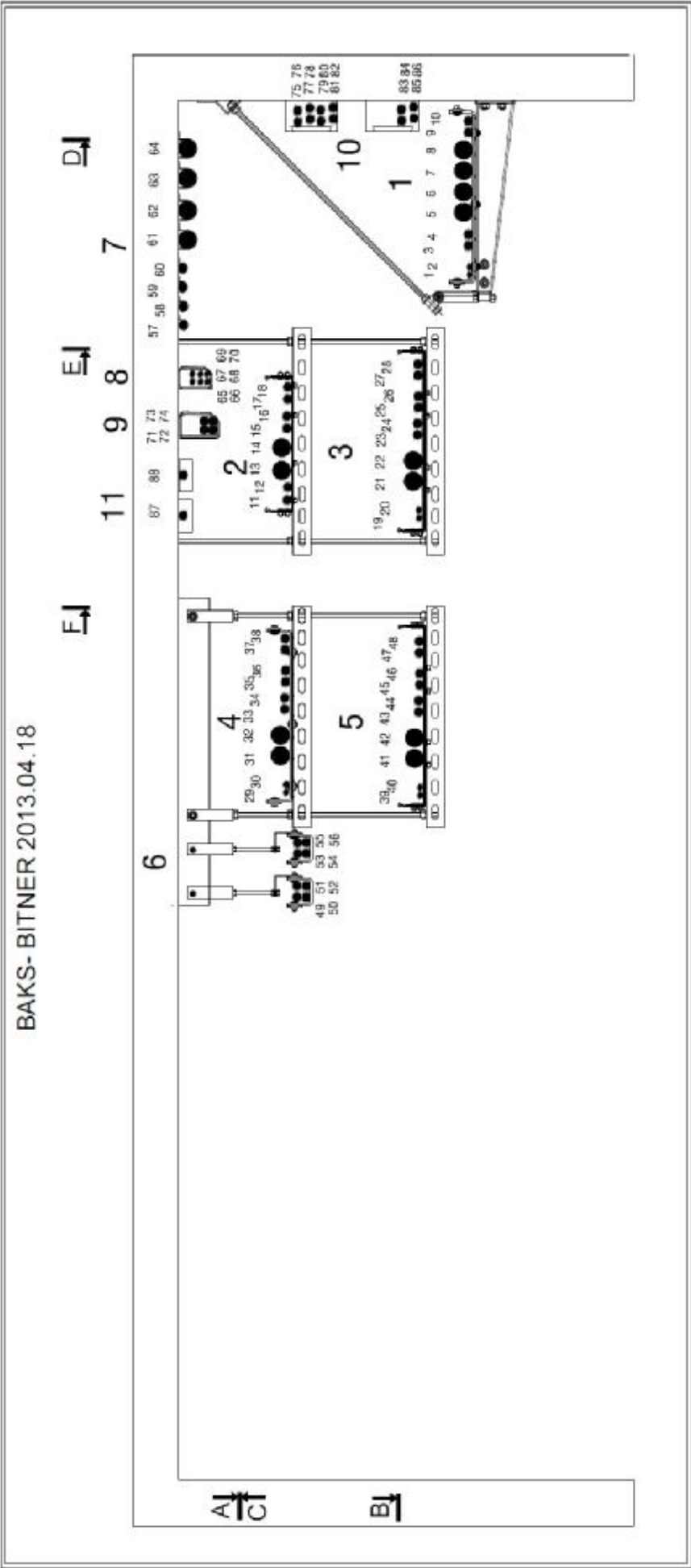
Nr	Nr Fires	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
39	36	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	5	Korytka kablowe KGJ/KGOJ 400H60/... B-400 1.5 m /20kg/m / grubość blachy 0,9 mm Mocowanie : Ceownik CWP/CWOP40H40/05, pręt gwintowany PG M10. Wieszak trapezowy WT 120 + pręt gwintowany PG M8 mocowany do blachy trapezowej +pokrywa korytka PKL400/2
40	35	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
41	34	NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
42	33	NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
43	68	HDGs 2x1,0 FE180/PH90/E90 300/500V		
44		HDGs 2x1,0 FE180/PH90/E90 300/500V		
45	67	HTKSH 1x2x0,8 FE180/PH90/E90 225V		
46		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
47	66	HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V		
48		HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V		
49	73	HDGs 2x1,0 FE180/PH90/E90 300/500V	6	Korytka siatkowe KDS/ KDSO 60H60/... B-60 1.5 m /2kg/m / grubość drutu fi 4,5 mm Mocowanie : WKS/WKSO60, pręt gwintowany PG M6. Wieszak trapezowy WT 120 + pręt gwintowany PG M6 mocowany do blachy trapezowej
50		HDGs 2x1,0 FE180/PH90/E90 300/500V		
51	72	BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		
52		BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		
53	44	NHXH 4x1,5RE FE180/E90 0,6/1kV		
54	43	NHXH 4x1,5RE FE180/E90 0,6/1kV		
55	42	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
56	41	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
57	20	NHXH 4x1,5RE FE180/E90 0,6/1kV	7	Uchwyt kablowy UDF. Mocowanie do Ytonga co 600mm za pomocą kołka MKR 6 (FMD 6 FISCHER)
58	19	NHXH 4x1,5RE FE180/E90 0,6/1kV		
59	18	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
60	17	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
61	16	NHXH 4x50RM FE180/E90 0,6/1kV		
62	15	NHXH 4x50RM FE180/E90 0,6/1kV		
63	14	(N)HXH 4x50RM FE180/E90 0,6/1kV		
64	13	(N)HXH 4x50RM FE180/E90 0,6/1kV		
65	64	BiTflame AS 1x2x0,8 FE180/PH90/E90 225V	8	Obejma kablowa OZM/OZMO Mocowanie do Ytonga co 600mm za pomocą kołka MKR 6 (FMD 6 FISCHER)
66		BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		
67	63	HTKSH 1x2x0,8 FE180/PH90/E90 225V		
68		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
69	62	HDGs 2x1,0 FE180/PH90/E90 300/500V		
70		HDGs 2x1,0 FE180/PH90/E90 300/500V		
71	32	NHXH 4x1,5RE FE180/E90 0,6/1kV	9	Obejma kablowa OZS/OZSO. Mocowanie do Ytonga co 600mm za pomocą kołka MKR 6 (FMD 6 FISCHER)
72	31	NHXH 4x1,5RE FE180/E90 0,6/1kV		
73	30	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
74	29	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		



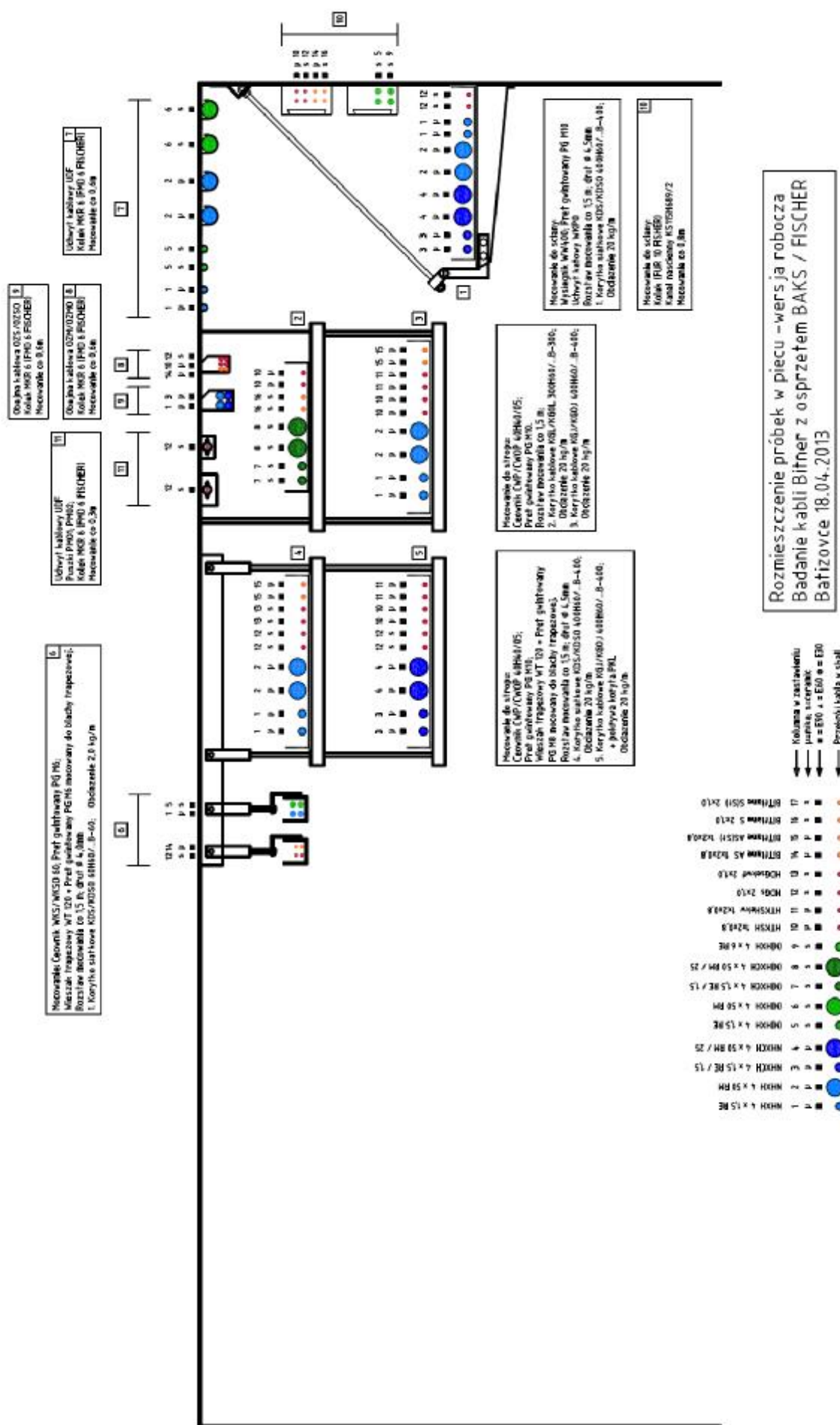
DRAWINGS

Nr	Nr Fires	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
75	56	HTKSH 1x2x0,8 FE180/PH90/E90 225V	10	Kanał naścienny KS115H68/2 Mocowanie do Ytonga co 800mm za pomocą kołka (FUR10 FISCHER)
76		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
77	55	HDGs 2x1,0 FE180/PH90/E90 300/500V		
78		HDGs 2x1,0 FE180/PH90/E90 300/500V		
79	54	BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		
80		BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		
81	53	BiTflame S 2x1,0 FE180/PH90/E90 300/500V		
82		BiTflame S 2x1,0 FE180/PH90/E90 300/500V		
83	12	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
84	11	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
85	10	(N)HXH 4x6 RE FE180/E90 0,6/1kV		
86	9	(N)HXH 4x6 RE FE180/E90 0,6/1kV		
87	65 B	HDGs 2x1,0 FE180/PH90/E90 300/500V + PMO2	11	Uchwyt kablowy UDF. Mocowanie do Ytonga co 300mm za pomocą kołka MKR 6 (FMD 6 FISCHER) + Puszka elektryczna PMO1 i PMO2
88	65 A	HDGs 2x1,0 FE180/PH90/E90 300/500V + PMO1		

Lp.	Symbol kabla	Ilość [szt.]	Średnica [mm]	Ciężar kabla [kg/m]
1	NHXH 4x1,5RE FE180/E90 0,6/1kV	12	14,6	0,3
2	NHXH 4x50RM FE180/E90 0,6/1kV	8	36,3	2,97
3	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	6	16,2	0,33
4	NHXCH 4x50RM/25 FE180/E90 0,6/1kV	4	38,4	3,21
5	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	6	14,6	0,3
6	(N)HXH 4x6RE FE180/E90 0,6/1kV	2	17,9	0,55
7	(N)HXH 4x50RM FE180/E90 0,6/1kV	2	35,2	2,85
8	(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	2	16,2	0,34
9	(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	2	38,6	3,18
10	HTKSH 1x2x0,8 FE180/PH90/E90 225V	10	5,9	0,04
11	HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	4	7,3	0,06
12	HDGs 2x1,0 FE180/PH90/E90 300/500V	14	6,7	0,06
13	HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	2	7,1	0,06
14	BiTflame AS 1x2x0,8 FE180/PH90/E90 225V	6	6,1	0,04
15	BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V	4	7,4	0,06
16	BiTflame S 2x1,0 FE180/PH90/E90 300/500V	4	6,8	0,06

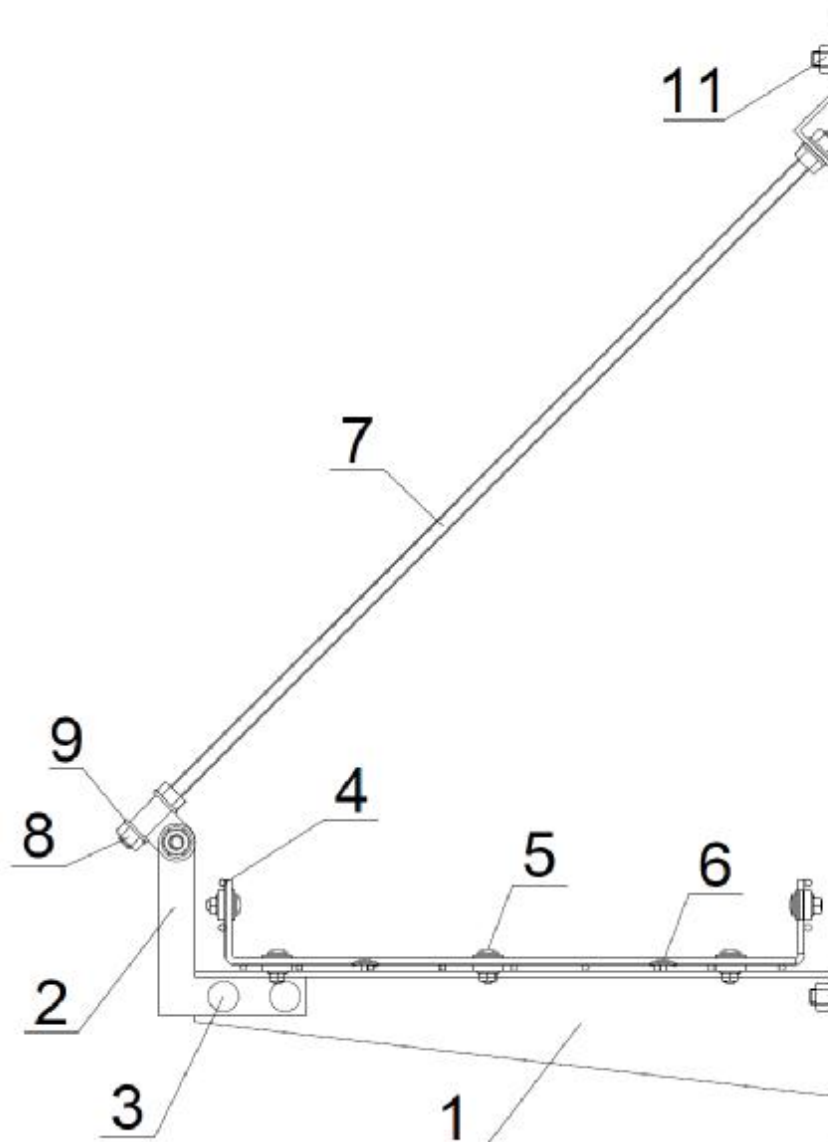


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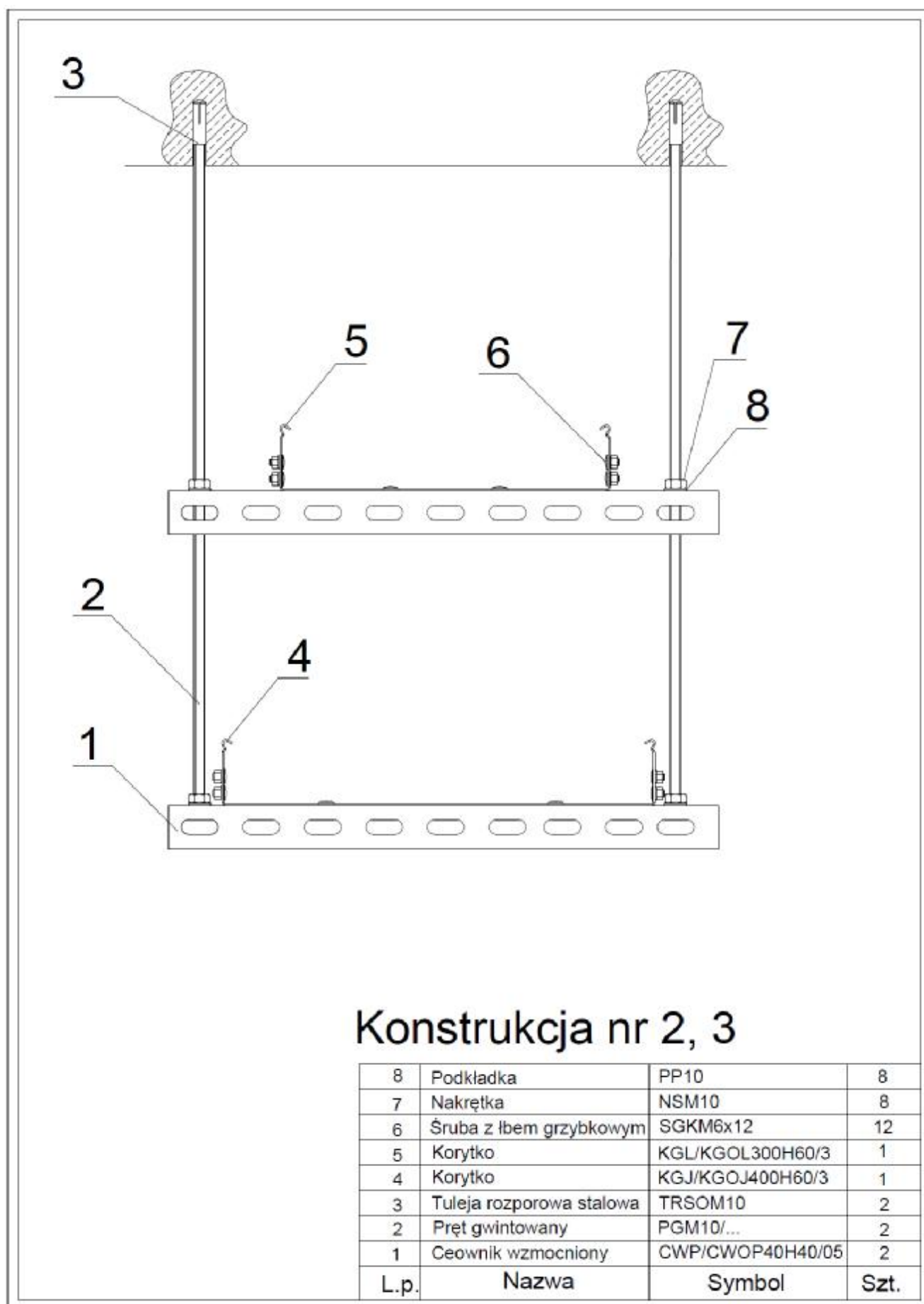


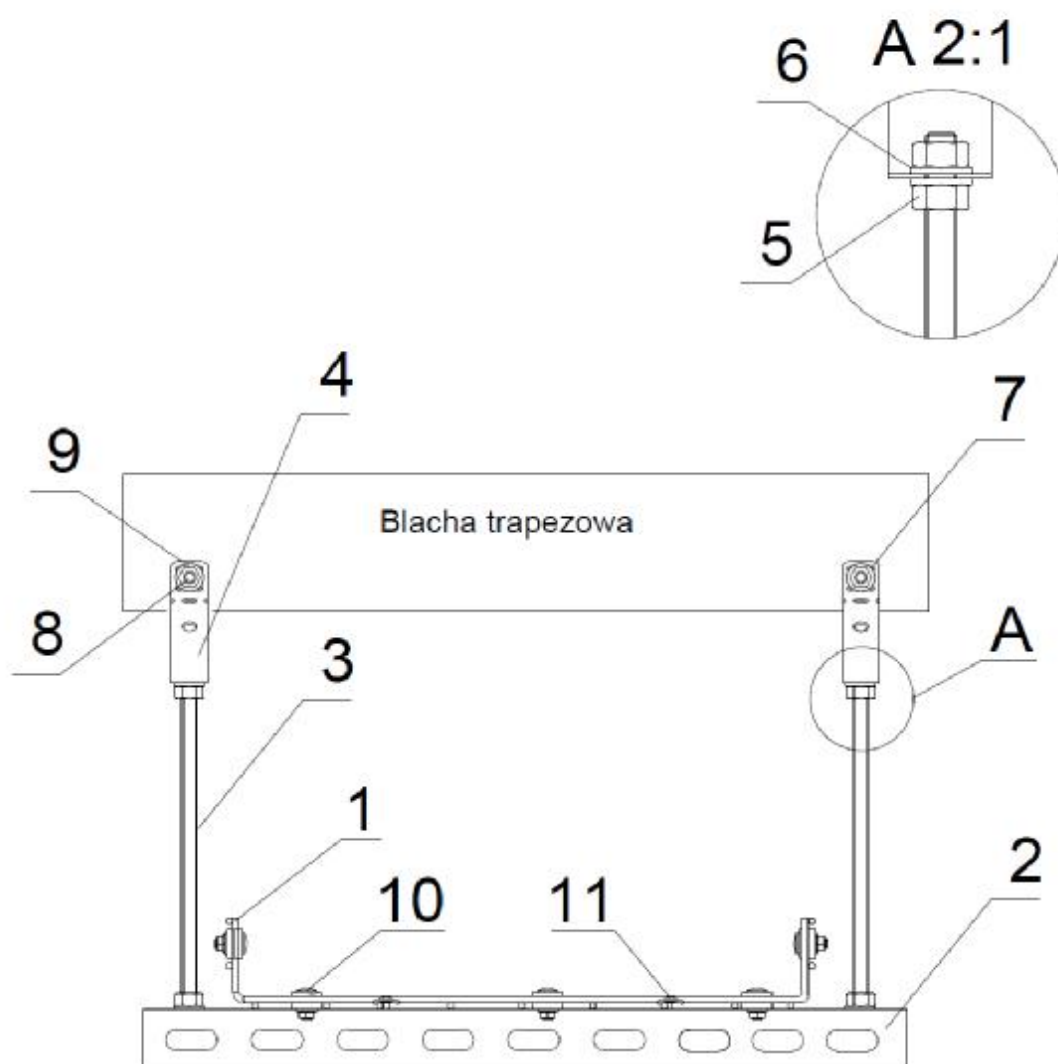
Konstrukcja nr 1

11	Śruba rozporowa	PSR/PSROM8x75	2
10	Uchwyt kątowy	WPKO	1
9	Podkładka	PP10	4
8	Nakrętka	NSM10	4
7	Pręt gwintowany	PGM10	1
6	Zacisk śrubowy	ZS/ZSO	2
5	Uchwyt śrubowy	USSN/USSO	5
4	Korytko siatkowe	KDS/KDSO400H60/3	1
3	Śruba z łbem grzybkowym	SGKM8x14	2
2	Uchwyt	UPWK/UPWKO	1
1	Wysięgnik wzmocniony	WW400	1
L.p.	Nazwa	Symbol	Szt.



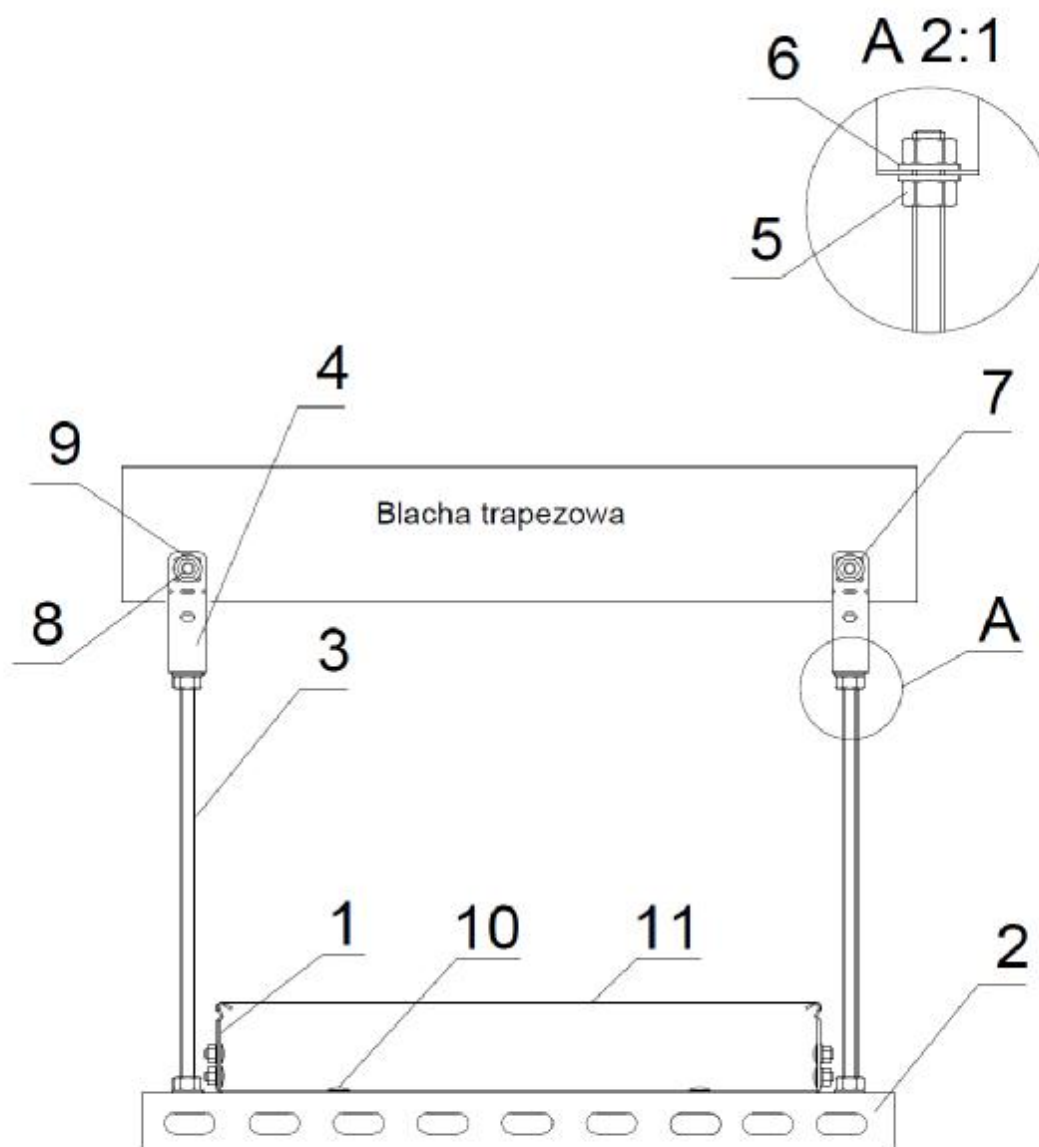
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Konstrukcja nr 4

11	Zacisk śrubowy	ZS/ZSO	2
10	Uchwyt śrubowy	USSN/USSO	5
9	Podkładka	PP8	4
8	Nakrętka	NSM8	4
7	Pręt gwintowany	PGM8/....	2
6	Podkładka	PP10	8
5	Nakrętka	NSM10	8
4	Wieszak trapezowy	WT/WTO120Ø11	2
3	Pręt gwintowany	PGM10/....	2
2	Ceownik wzmocniony	CWP/CWOP40H40/05	1
1	Korytko siatkowe	KDS/KDSO400H60	1
L.p.	Nazwa	Symbol	Szt.

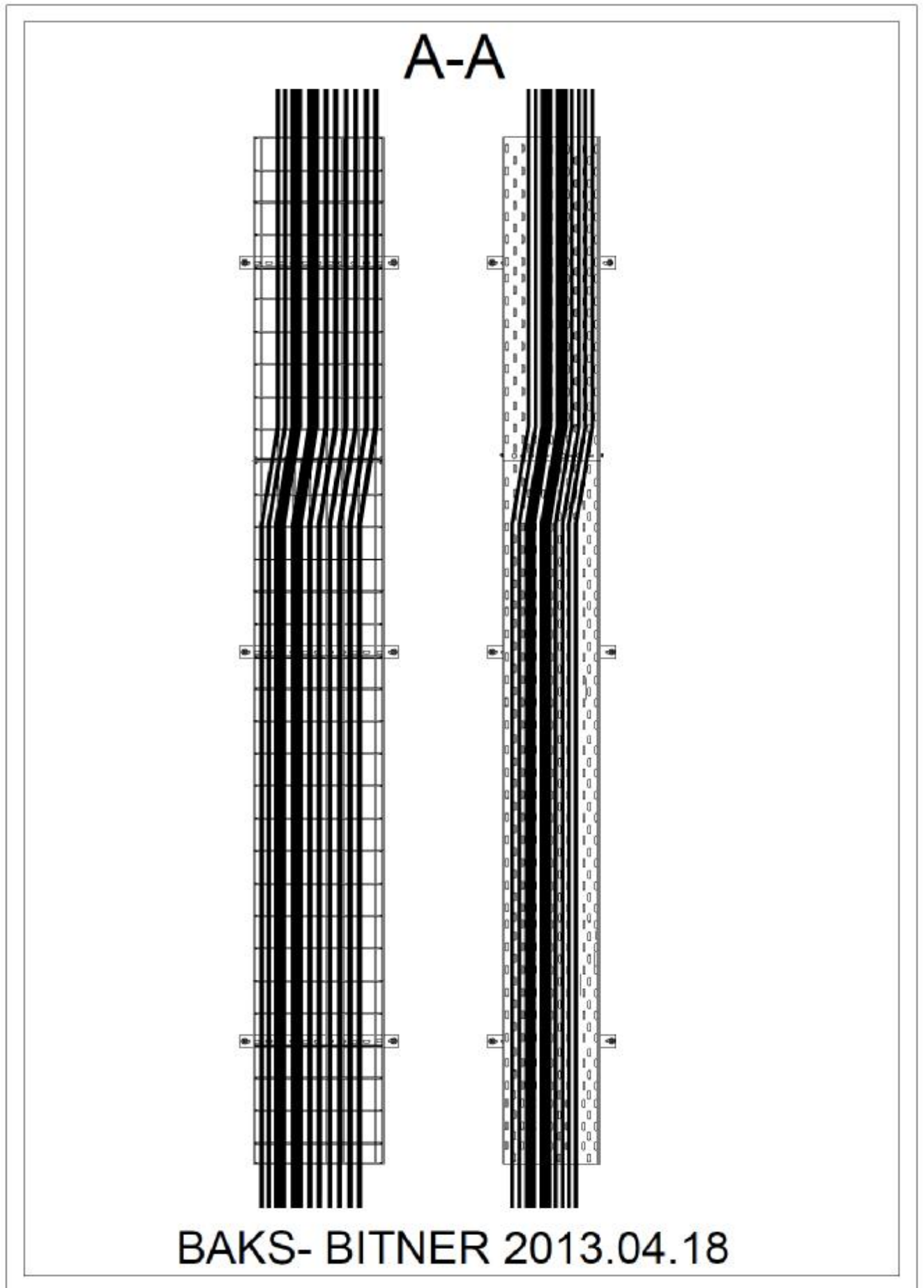


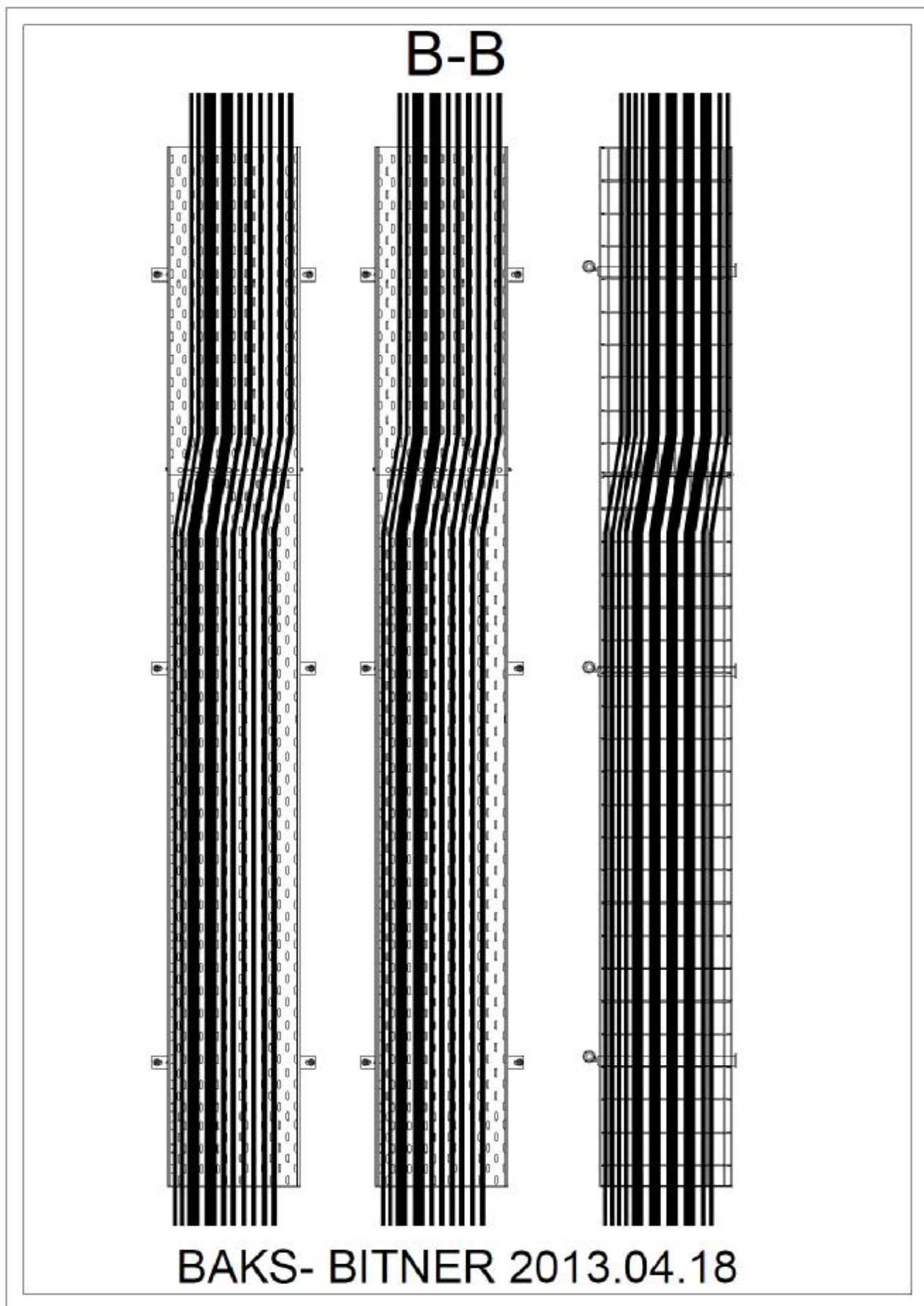
Konstrukcja nr 5

11	Pokrywa korytka	PKL400/2	1
10	Śruba z łbem grzybkowym (kpl.)	SGKM6x12	6
9	Podkładka	PP8	4
8	Nakrętka	NSM8	4
7	Pręt gwintowany	PGM8/....	2
6	Podkładka	PP10	8
5	Nakrętka	NSM10	8
4	Wieszak trapezowy	WT/WT0120Ø11	2
3	Pręt gwintowany	PGM10/....	2
2	Ceownik wzmacniony	CWP/CWOP40H40/05	1
1	Korytko	KGJ/KGOJ400H60/3	1
L.p.	Nazwa	Symbol	Szt.



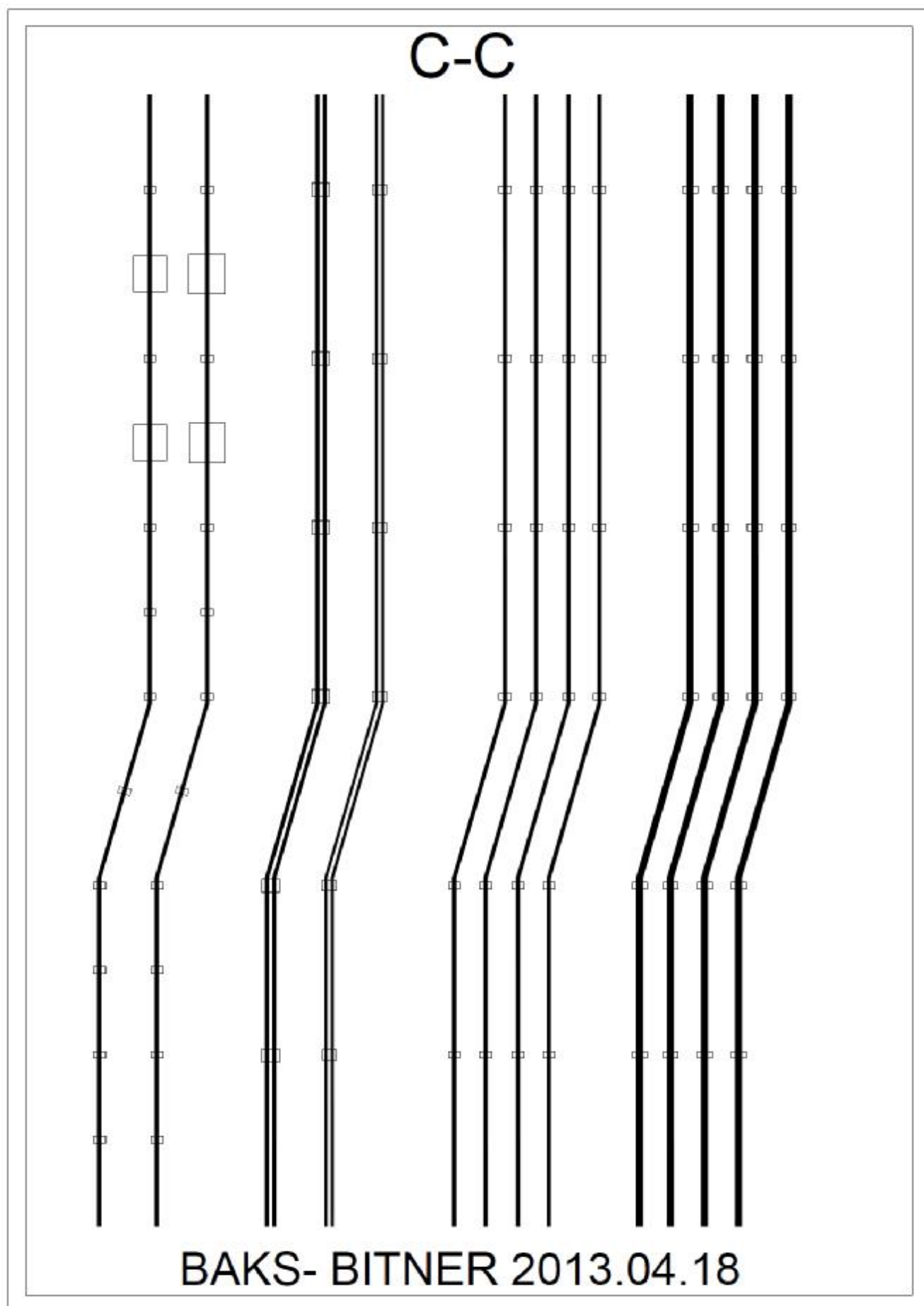
DRAWINGS





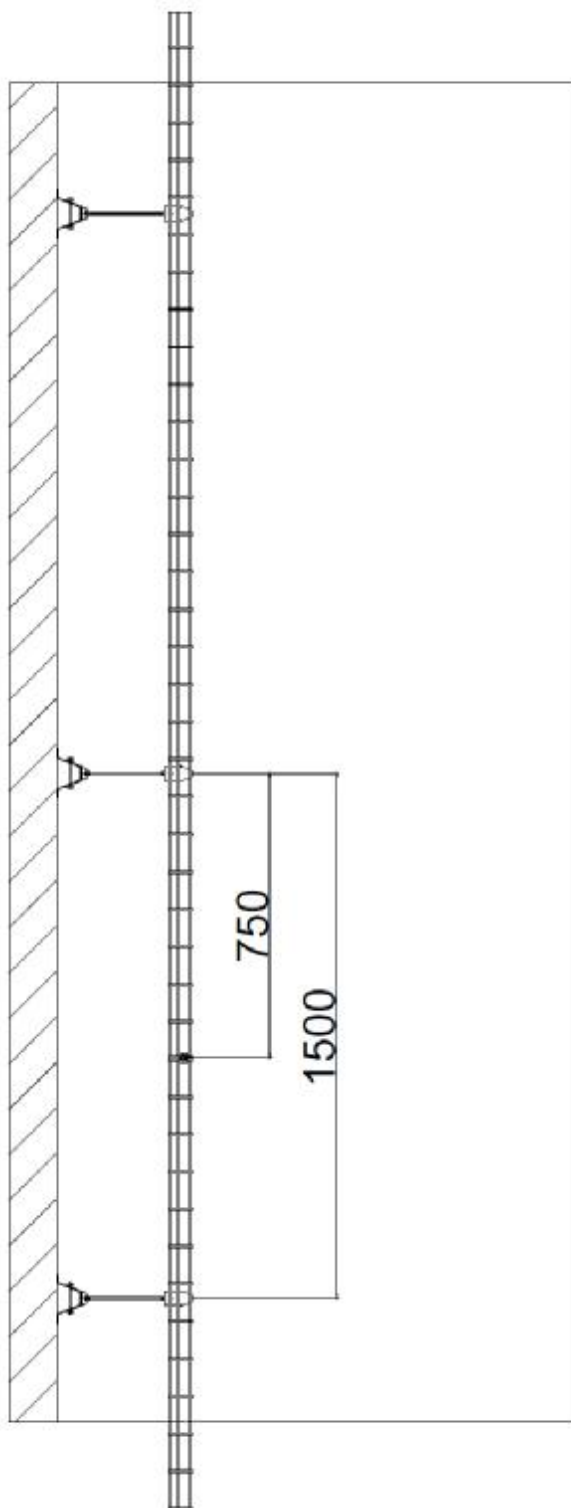


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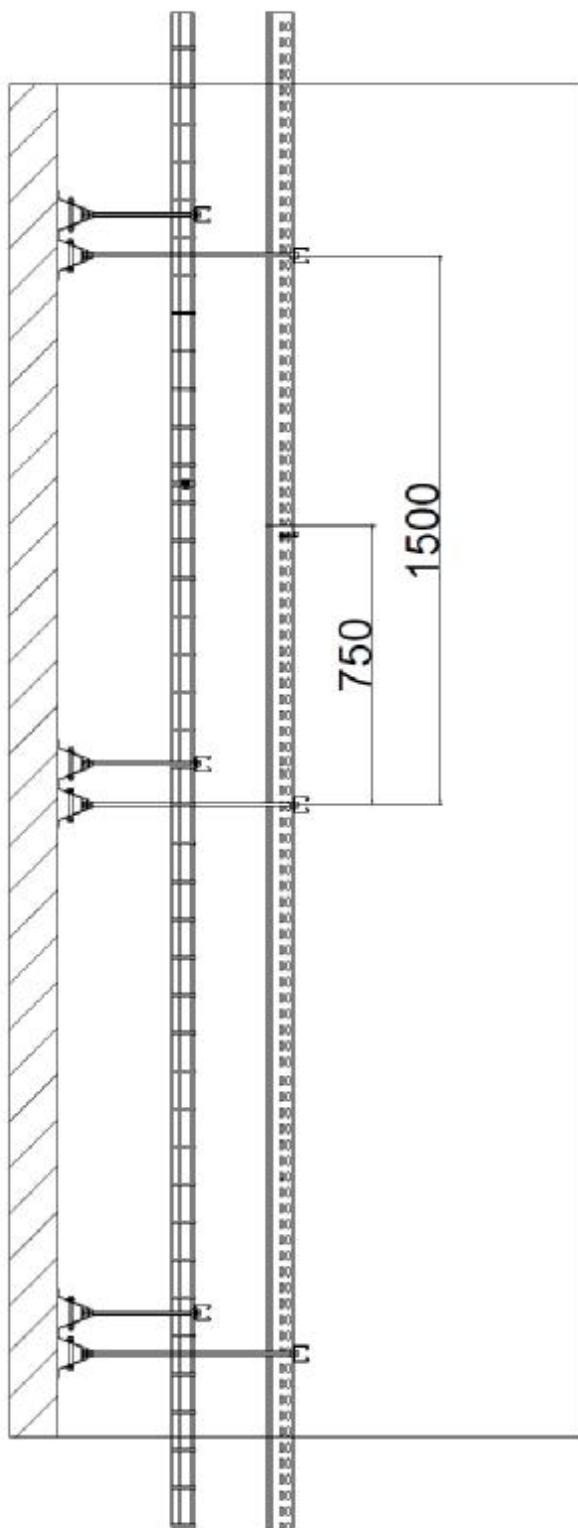
D-D



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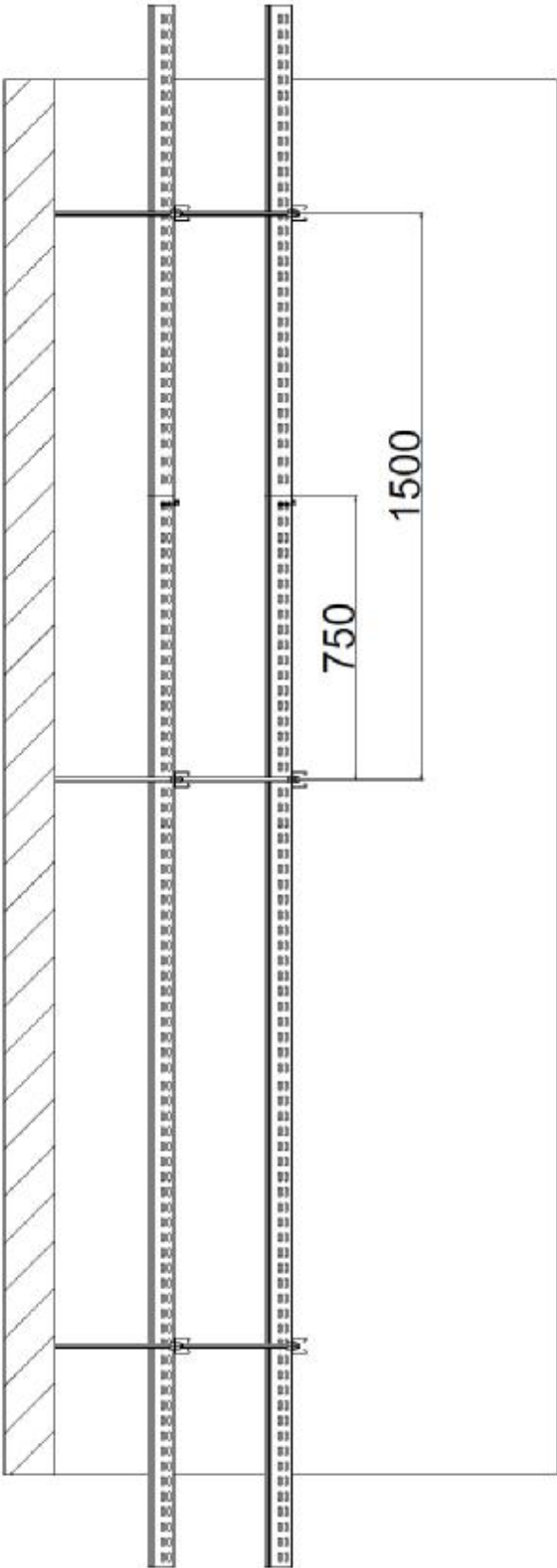
E-E



BAKS- BITNER 2013.04.18



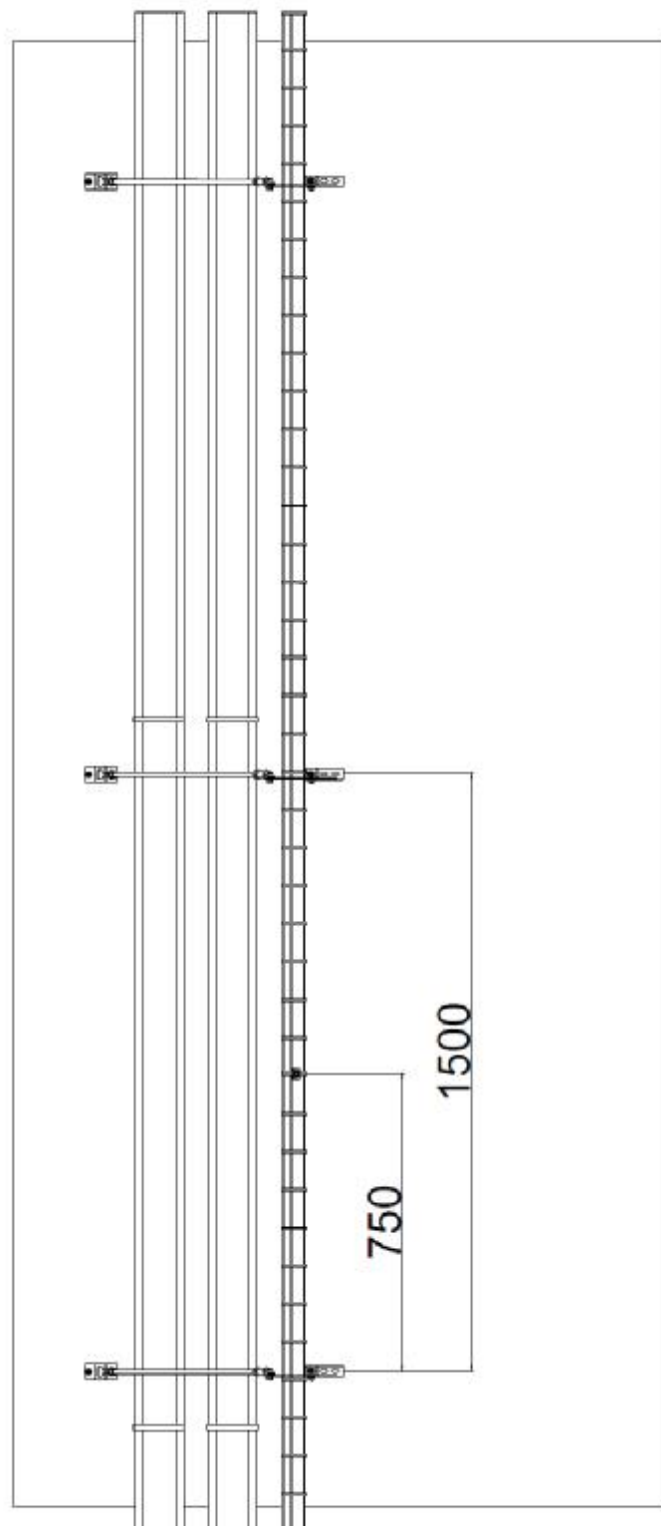
F-F



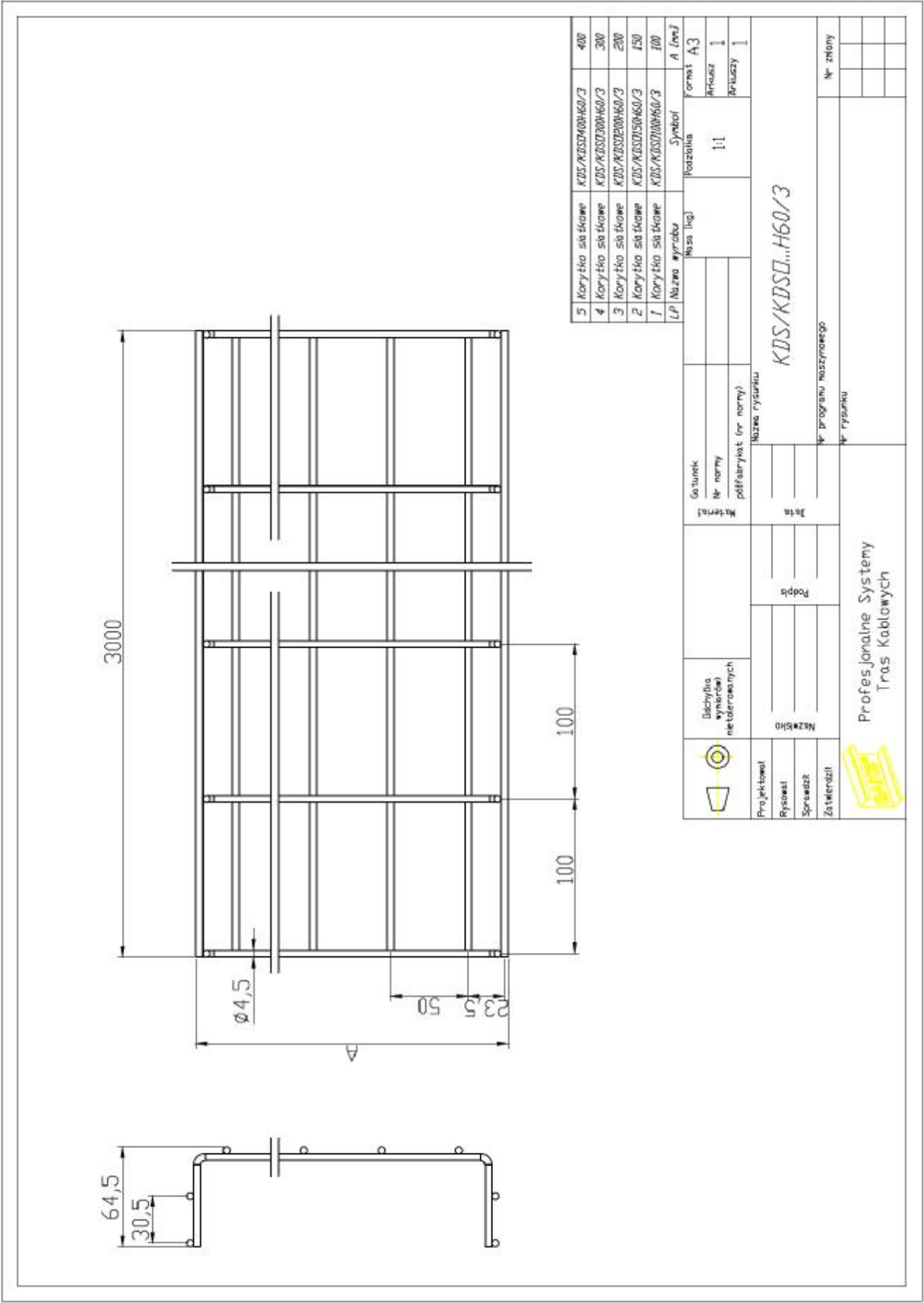
BAKS- BITNER 2013.04.18



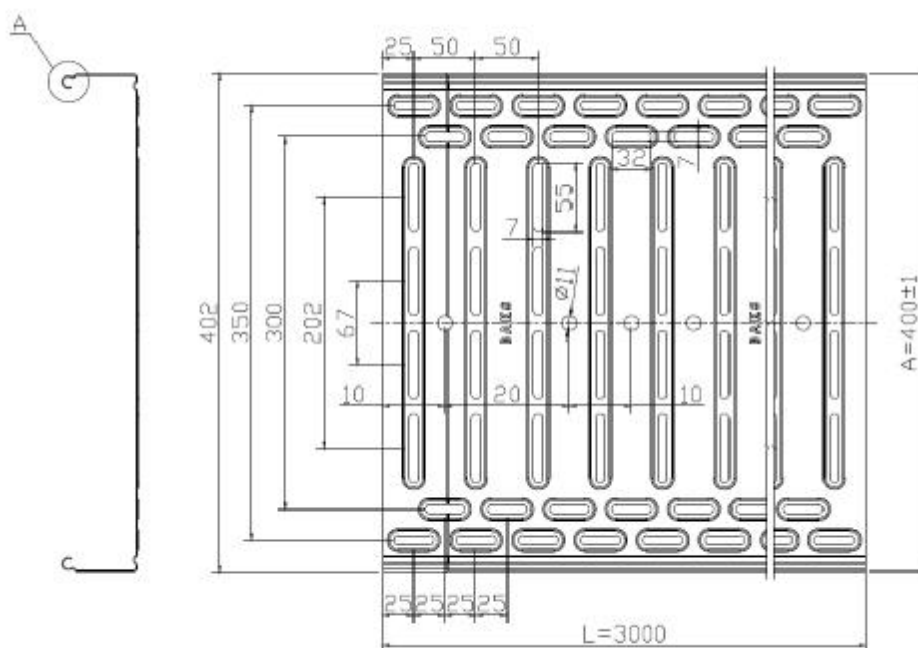
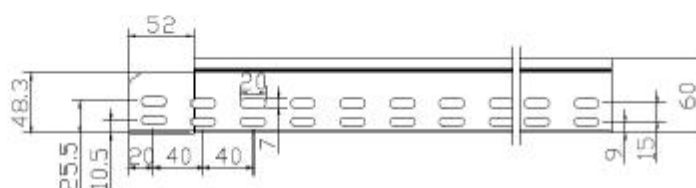
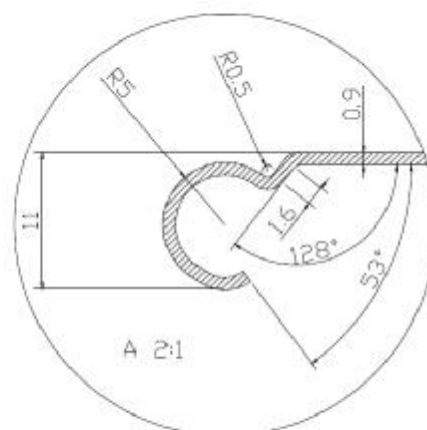
G-G



BAKS- BITNER 2013.04.18

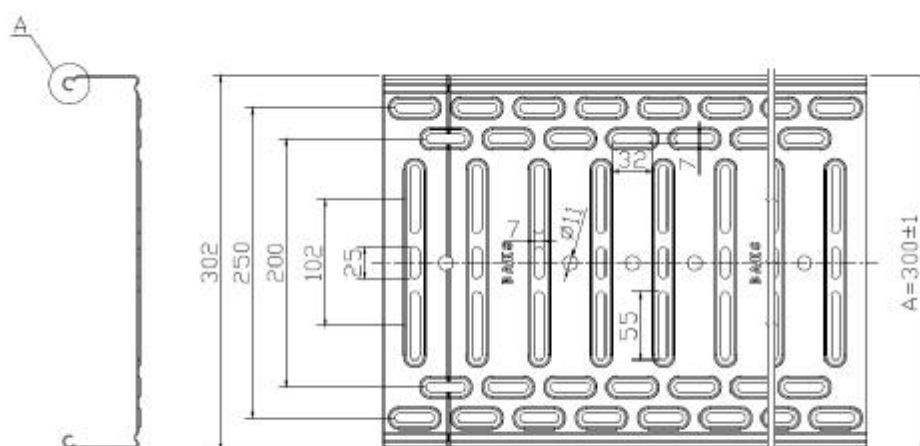
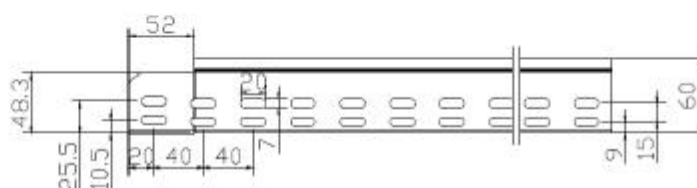
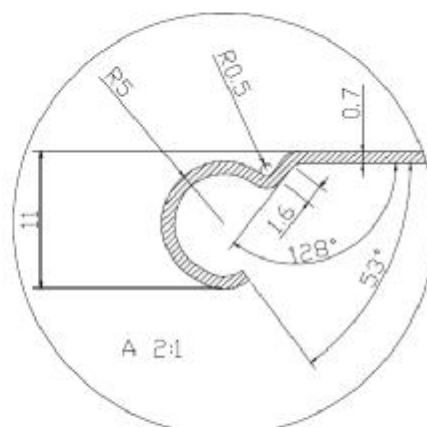


Typ	Szerokość A(mm)	Długość L(mm)
KGJ/KGDJ100H60/3	100	3000
KGJ/KGDJ200H60/3	200	3000
KGJ/KGDJ300H60/3	300	3000
KGJ/KGDJ400H60/3	400	3000



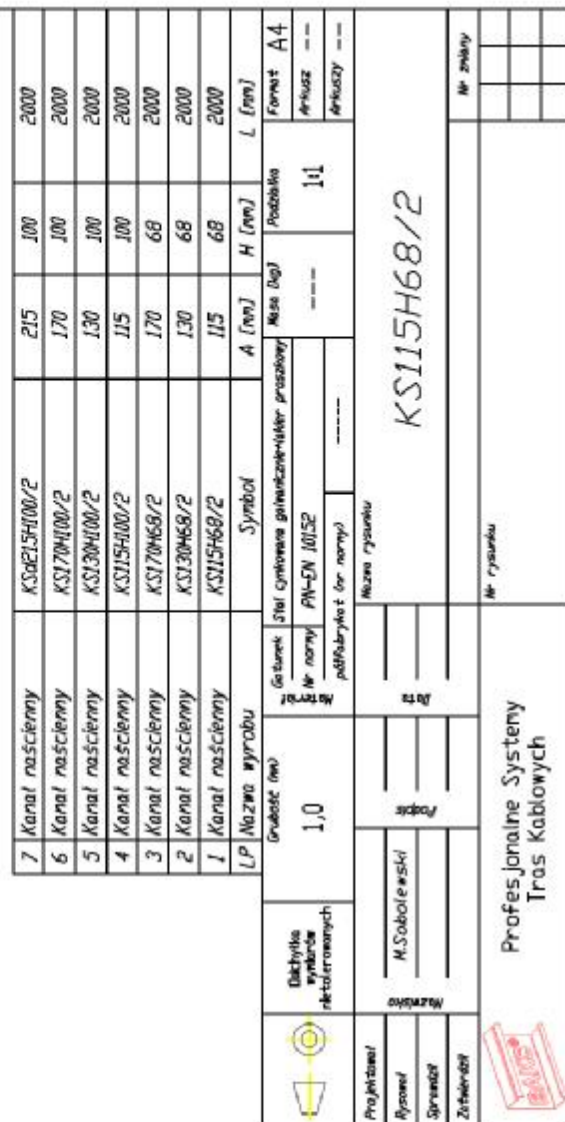
	Oddział Wydział Instalacji	Materiał	Główny	Masa Dłgł	Podziałka 1:5	Format A4
			Nr normy			Arkusz
			półfabrykat (nr normy)			Arkuszy
Projektant	Nazwisko	Płeć	Data	Nazwa rysunku KGJ/KGJ...H60/3		
Rysownik						
Sprzedaż						
Zatwierdził				Nr programu maszynowego		
			Nr rysunku			Nr złoży
Profesjonalne Systemy Tras Kablowych						

Typ	Szerokość A(mm)	Długość L(mm)
KGL/KGDL100H60/3	100	3000
KGL/KGDL200H60/3	200	3000
KGL/KGDL300H60/3	300	3000

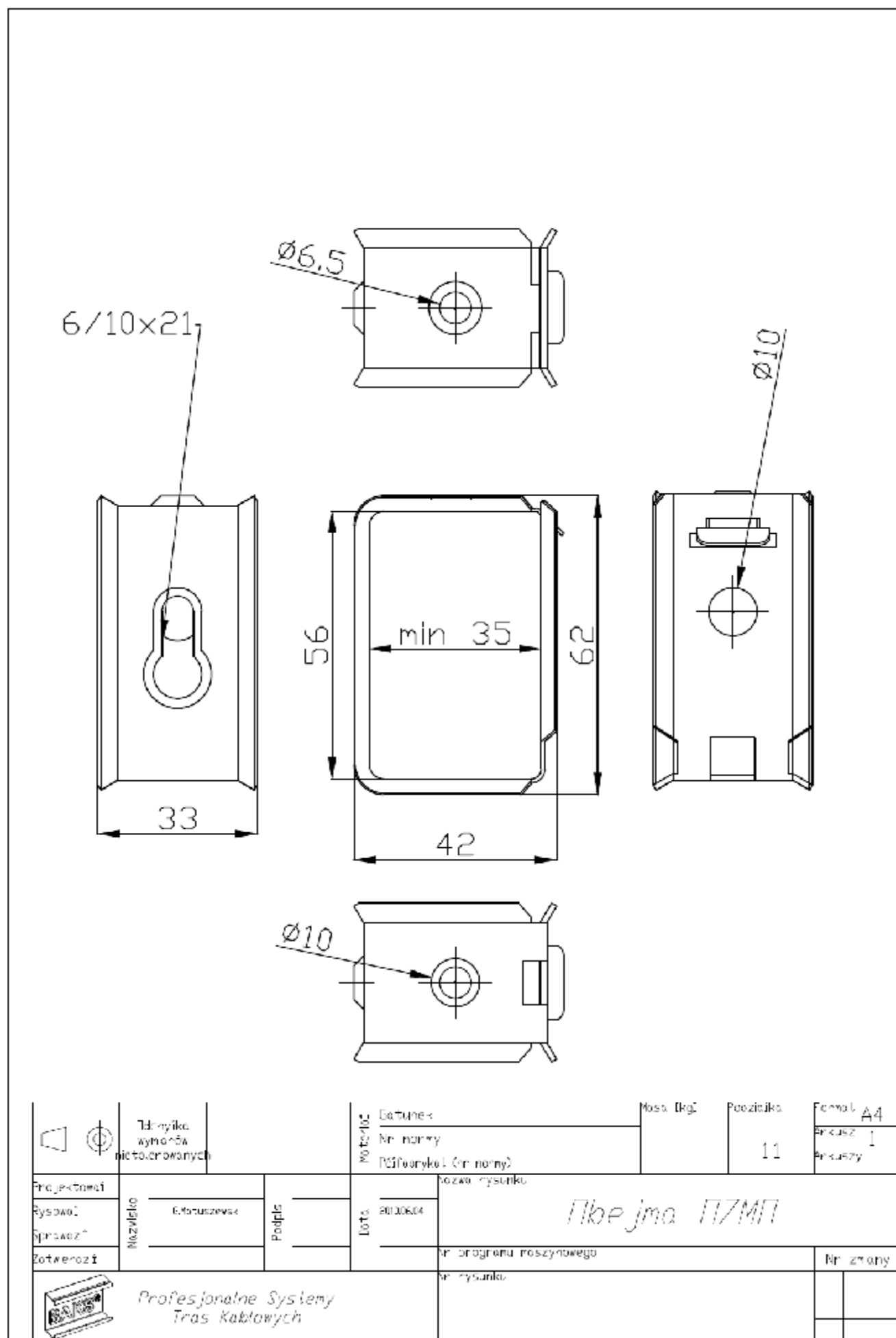


		Dokładka symbolów niezderowanych		Materiał	Gatunek		Masa kabl.	Podziałka	Format
					Nr normy			1:5	A4
					półfabrykat (nr normy)				Arkusz
									Arkuszy
Projektował					Nazwa rysunku				
Rysował					KGL/KGOL...H60/3				
Sprawił									
Zatwierdził					Nr programu maszynowego				
					Nr rysunku				
 Profesjonalne Systemy Tras Kablowych									

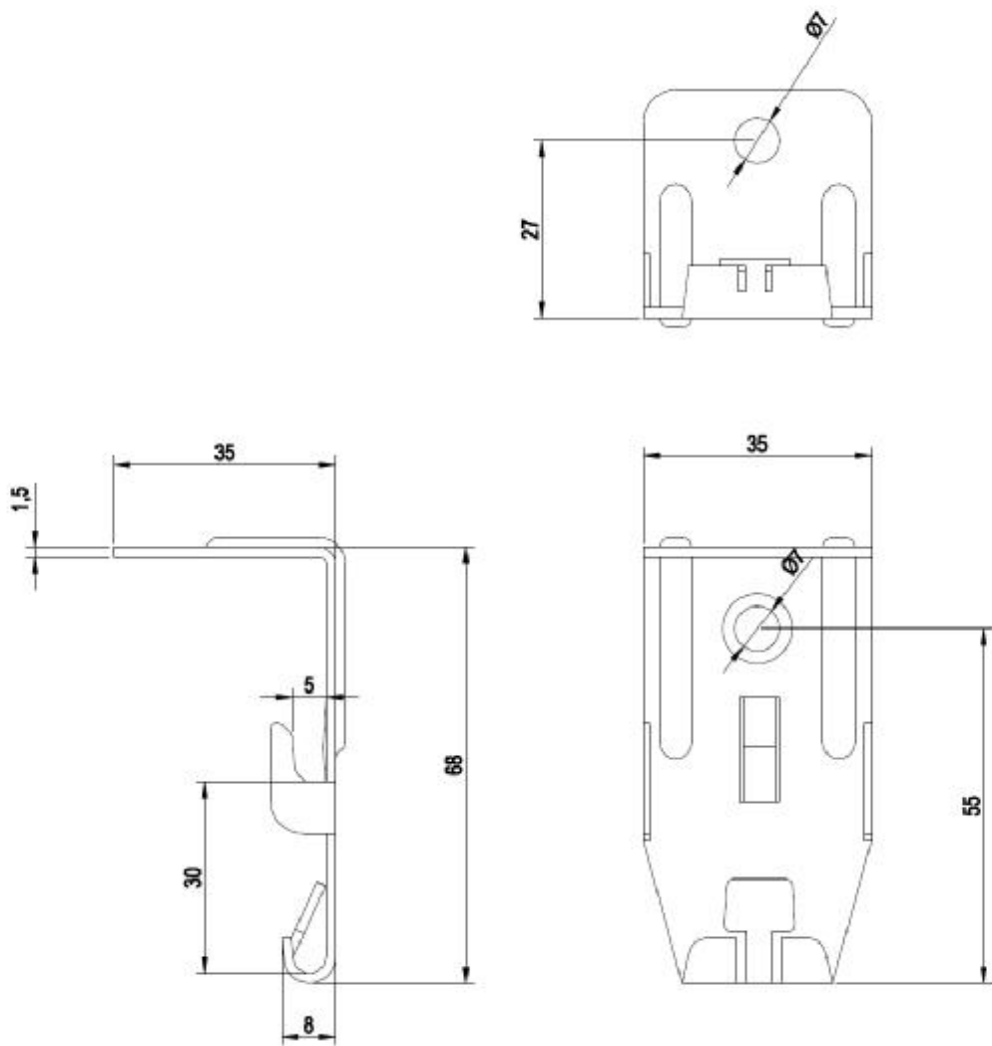
FIRES 064/S-22/03/2012-E



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	Długość wykorzystania metalicznych		Materiał Główny Nr. normy Półfabrykat (nr. normy) Baza	Nazwa rysunku Długość Szerokość Wysokość	1:1	Format A4 Strona 1 Arkuszy 2				
	T. Gruchalski									
	J. Jankowski									
	J. Kuczek									
Projektant	K. Słotwiński		Nazwa rysunku Długość Szerokość Wysokość							
Rysownik			Nazwa rysunku Długość Szerokość Wysokość							
Sprawdzający			Nazwa rysunku Długość Szerokość Wysokość							
Zatwierdzający			Nazwa rysunku Długość Szerokość Wysokość							
Profesjonalne Systemy Tras Kablowych			Nazwa rysunku Długość Szerokość Wysokość							



	Odczytyła wymiarów niezależnych		Materiał	Dotunek		Masa [kg]	Pozycja	Format	A4	
				Nr rysunku	PK-B1 10142 + A1 - 101				Arkusz	1
				polibrylat (z rysunku)					Arkazy	1
Projektował	Nazwa P. ORODZKI	Proje 	Data	Nazwa rysunku						
Rysował				WKSO60						
Sprowadził										
Zobowiązał										
	JUKCZEK		20.07.2009	Nr programu maszynowego	---			Nr arkusza		
 Profesjonalne Systemy Tras Kablowych				Nr rysunku						



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