TEST REPORT FIRES-FR-030-13-AUNE

Cable bearing system and fireboxes BAKS with cables business Zakłady Kablowe BITNER Celina Bitner

Reg. No. 041/S-159

The Experts on Fire Safety

TEST REPORT

FIRES-FR-030-13-AUNE

Tested property:	Function in fire
Test method:	STN 92 0205: 2012 (ZP-27/2008, DIN 4102-12: 1998-11)
Date of issue:	28. 02. 2013
Name of the product:	Cable bearing system and fireboxes BAKS with cables business Zakłady Kablowe BITNER Celina Bitner
Manufacturer:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05 - 480 Karczew, Poland - producer of construction Zakłady Kablowe BITNER Celina Bitner, ul. Friedleina 3/3, 30-009 Kraków, Poland – producer of cables
Sponsor:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland
Task No.:	PR-13-0066
Specimens received:	25. 02. 2013
Date of the test:	28. 02. 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: 1999 are used. According to DIN 4102-12: 1998-11, common thermocouples of construction which was used for this measurement till issue of EN 1363-1:1999 are used. Measurement by plate thermometers acc. to EN 1363-1: 1999 can be considered as stricter method of temperature control in test furnace in compare with thermocouples used till issue of EN 1363-1: 1999. 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. Artur Mucha	BAKS Kazimierz Sielski
Mr. Jerzy Kowalski	BAKS Kazimierz Sielski
Mr. Marcin Tokaj	Zakłady Kablowe BITNER Celina Bitner
Mr. Tomasz Latacz	Zakłady Kablowe BITNER Celina Bitner
Mr. Dominik Palka	Zakłady Kablowe BITNER Celina Bitner

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 54 059	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 Zakłady Kablowe BITNER Celina Bitner 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, cable mesh trays, cable clips and fireboxes with accessories (consoles, supports, hangers etc.) and power and communication halogen free cables of Zakłady Kablowe BITNER Celina Bitner company.

Cables

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

The length of cables was 4,5 m, 3 m from that was exposed to fire.

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

Power and communication halogen free cables were not fixed in the trays in the points of allowed bending radius.

Cable bearing systems were made of following constructions:

Suspension tracks No. 1 and 2
Tracks are made of three consoles (WPC/WPCO1000) which are fixed to ceiling by two threaded rods (PG M10) in spacing of 1500 mm. Two brackets (WMC/WMCO400) are fixed to consoles by screws (SM M10x30). Holders (UPW/UPWO) are fixed at the end of brackets with screws (SGN M8x14). Brackets are fixed through these holders by threaded rods (PG M10) with washer and nuts (M10) to ceiling holders (USV/USOV).

Tracks No. 1 and 2:
Cable trays (KGL/KGOL300H60/B-300, steel sheet thickness 0,7 mm) fixed together by screws (SGN M6x12). Trays are fixed to supports by screws (SGN M6x12) and loaded with 20kg.m^{-1}.

Suspension tracks No. 3 and 4
Tracks are made of three consoles (WPC/WPCO1000) which were fixed to ceiling by two threaded rods (PG M10) in spacing of 1500 mm. Two brackets (WMC/WMCO400) were fixed to consoles by screws (SM M10x30). Holders (UPW/UPWO) were fixed at the end of brackets with screws (SGN M8x14). Brackets were fixed through these holders by threaded rods (PG M10) with washer and nuts (M10) to ceiling holders (USV/USOV).

Tracks No. 3 and 4:
Cable trays (KGJ/KGOJ400H60/B-400, steel sheet thickness 0,9 mm) fixed together by screws (SGN M6x12). Trays are fixed to supports by screws (SGN M6x12) and loaded with 20kg.m^{-1}.

Suspension tracks No. 5 and 6
Tracks are made of three consoles combined of two horizontal supports (CWP/CWOP40H40/05) and two threaded rods (PG M10) fixed to trapezoidal steel sheets by hangers (WT/WTO120) and threaded rods (PG M8) in spacing of 1500 mm.

Tracks No. 5 and 6:
Cable mesh trays (KDS/KDSO400H60/B-400, steel wire ∅ 4,5 mm) fixed together by junctions (USS/USSO). Mesh trays are fixed to supports by junctions (ZS/ZSO) and loaded with 20kg.m^{-1}. Cables at mesh trays are fixed by cable clips (UKZ/UKZO1).

Suspension tracks No. 7 - 10
Tracks are made of three consoles combined of two horizontal supports (CWP/CWOP40H40/05) and two threaded rods (PG M10) fixed through the ceiling in spacing of 1500 mm.

Tracks No. 7 and 8:
Cable trays (KGL/KGOL300H60/B-300, steel sheet thickness 0,7 mm) fixed together by screws (SGN M6x12). Trays are fixed to supports by screws (SGN M6x12) and loaded with 20kg.m^{-1}.

Tracks No. 9 and 10:
Cable trays (KGJ/KGOJ400H60/B-400, steel sheet thickness 0,9 mm) fixed together by screws (SGN M6x12). Trays are fixed to supports by screws (SGN M6x12) and loaded with 20kg.m^{-1}.

Track No. 11
Supporting construction is made of gypsum boards 12 mm thick fixed to side wall of furnace. Track is made of cable clips (UDF) fixed to gypsum boards by dowels (HM 5x37S) in spacing of 600 mm.

Track No. 12
Track is made of fireboxes (PMO1) and cable clips (KSA) fixed to ceiling in spacing of 300 mm.

Track No. 13
Track is made of fireboxes (PMO2) and cable clips (KSA) fixed to ceiling in spacing of 300 mm.

Track No. 14
Track is made of threaded rods (PG M6) fixed to trapezoidal steel sheet by hangers (WT/WTO120) and threaded rods (PG M6) in spacing of 1500 mm.

Cable mesh trays (KDS/KDSO60H60/3, steel wire ∅ 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. 15
Track is made of cable clips (UDF) fixed to side wall of furnace by dowels (FMD 6x32) and (FMD 6x40) in spacing of 600 mm.

All bearing systems were from steel, galvanized according to the Sendzimir method PN-EN 10327:2005.

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 – 6 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	19,5
standard deviation	0,6

Relative air humidity [%]

mean	45,6
standard deviation	2,4

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 (3000 x 3000 x 2750) 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 O_2) 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]
28. 02. 2013	42,4	19,6

5.3 RESULTS OF THE TEST

Measured values are stated in this test report.

6. CLOSING

Evaluation of the test:

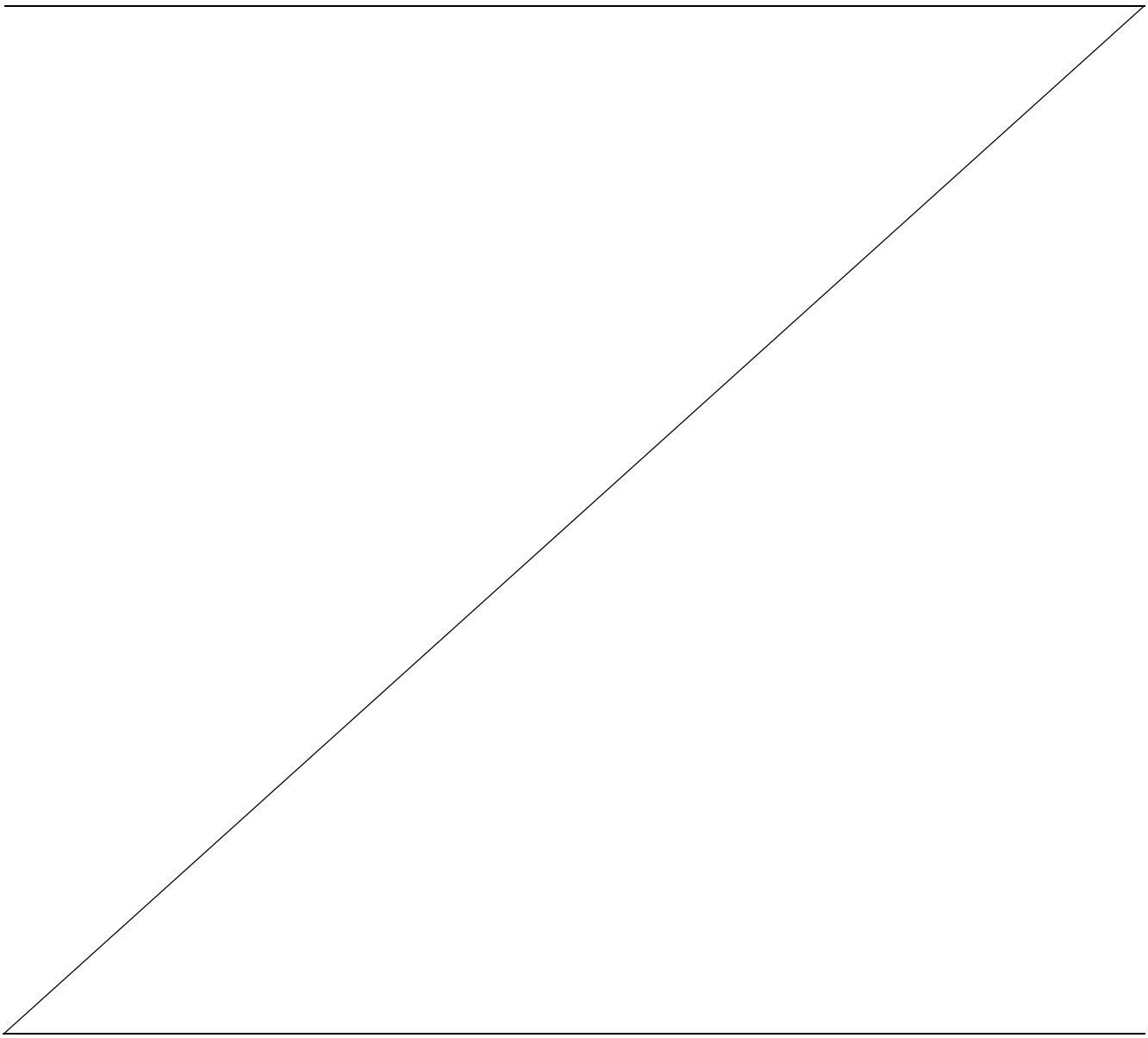
Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
1	cable (N)HXH 4x50RM FE180/E90 0,6/1kV	11	53 minutes
2	cable (N)HXH 4x50RM FE180/E90 0,6/1kV		90 minutes no failure / interruption
3	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		90 minutes no failure / interruption
4	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		84 minutes
5	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
6	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
7	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	10	90 minutes no failure / interruption
8	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		90 minutes no failure / interruption
9	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		61 minutes
10	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		60 minutes
11	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV	9	90 minutes no failure / interruption
12	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
13	cable (N)HXH 4x50RM FE180/E90 0,6/1kV		90 minutes no failure / interruption
14	cable (N)HXH 4x50RM FE180/E90 0,6/1kV		90 minutes no failure / interruption
15	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV + fireboxes PMO2	13	90 minutes no failure / interruption
16	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV	8	90 minutes no failure / interruption
17	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV		90 minutes no failure / interruption
18	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		90 minutes no failure / interruption
19	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		90 minutes no failure / interruption
20	cable NHXH 4x50RM FE180/E90 0,6/1kV	7	90 minutes no failure / interruption
21	cable NHXH 4x50RM FE180/E90 0,6/1kV		90 minutes no failure / interruption
22	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
23	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
24	cable NHXH 4x50RM FE180/E90 0,6/1kV	6	90 minutes no failure / interruption
25	cable NHXH 4x50RM FE180/E90 0,6/1kV		90 minutes no failure / interruption
26	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		88 minutes
27	cable NHXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
28	cable (N)HXH 4x50RM FE180/E90 0,6/1kV	5	31 minutes
29	cable (N)HXH 4x50RM FE180/E90 0,6/1kV		90 minutes no failure / interruption
30	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		84 minutes
31	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		89 minutes
32	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV	14	90 minutes no failure / interruption
33	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
34	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		50 minutes
35	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		69 minutes
36	cable (N)HXH 4x6RE FE180/E90 0,6/1kV + fireboxes PMO2	13	90 minutes no failure / interruption
37	cable (N)HXH 4x6RE FE180/E90 0,6/1kV + fireboxes PMO1	12	90 minutes no failure / interruption
38	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV+ fireboxes PMO1		90 minutes no failure / interruption
39	2 cables NHXCH 4x50RM/25 FE180/E90 0,6/1kV	4	90 minutes no failure / interruption
40	2 cables NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		90 minutes no failure / interruption
41	2 cables NHXH 4x50RM FE180/E90 0,6/1kV	3	90 minutes no failure / interruption
42	2 cables NHXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
43	2 cables (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	2	90 minutes no failure / interruption
44	2 cables (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		67 minutes
45	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	1	90 minutes no failure / interruption
46	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
47	2 cables (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	15	85 minutes
48	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV		63 minutes
49	2 cables (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		68 minutes
50	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV		90 minutes no failure / interruption
52A	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	11	73 minutes
52B	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption
53A	2 cables BiTflame S(St) 2x1,0 FE180/PH90/E90 300/500V	10	90 minutes no failure / interruption
53B	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption
54A	2 cables BiTflame S 2x1,0 FE180/PH90/E90 300/500V	9	90 minutes no failure / interruption
54B	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption
55	cable JE-H(St)H 2x2x0,8 FE180/E90 225V + fireboxes PMO2	13	90 minutes no failure / interruption
56	cable HTKSH 1x2x0,8 FE180/E90 225V + fireboxes PMO2		90 minutes no failure / interruption
57	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	8	77 minutes
58	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	7	51 minutes
59A	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V - test	16	90 minutes no failure / interruption
59B	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V - test		6 minutes
60A	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	6	90 minutes no failure / interruption
60B	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		90 minutes no failure / interruption
61A	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	5	90 minutes no failure / interruption
61B	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		57 minutes
62	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	14	36 minutes
63	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		90 minutes no failure / interruption
64	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V		90 minutes no failure / interruption

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
65	2 cables BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V	4	73 minutes
66	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		88 minutes
67	2 cables BiTflame AS 1x2x0,8 FE180/PH90/E90 225V	3	90 minutes no failure / interruption
68	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		41 minutes
69	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	2	68 minutes
70	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	1	90 minutes no failure / interruption
71	cable JE-H(St)H 2x2x0,8 FE180/E90 225V + fireboxes PMO1	12	90 minutes no failure / interruption
72	cable HTKSH 1x2x0,8 FE180/E90 225V + fireboxes PMO1		90 minutes no failure / interruption
73	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	15	90 minutes no failure / interruption
74	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V		90 minutes no failure / interruption

The fire test was discontinued in 94th minute at the request of test sponsor.

Specimens S1 – S50 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S74 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.
Circuit breakers with rating 3 A were used.

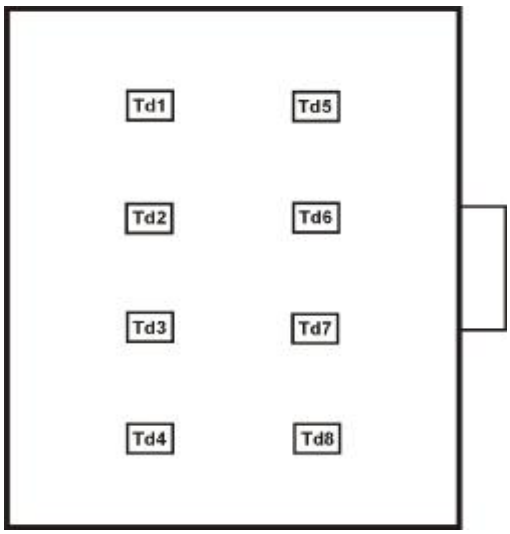


Measured values inside the test furnace

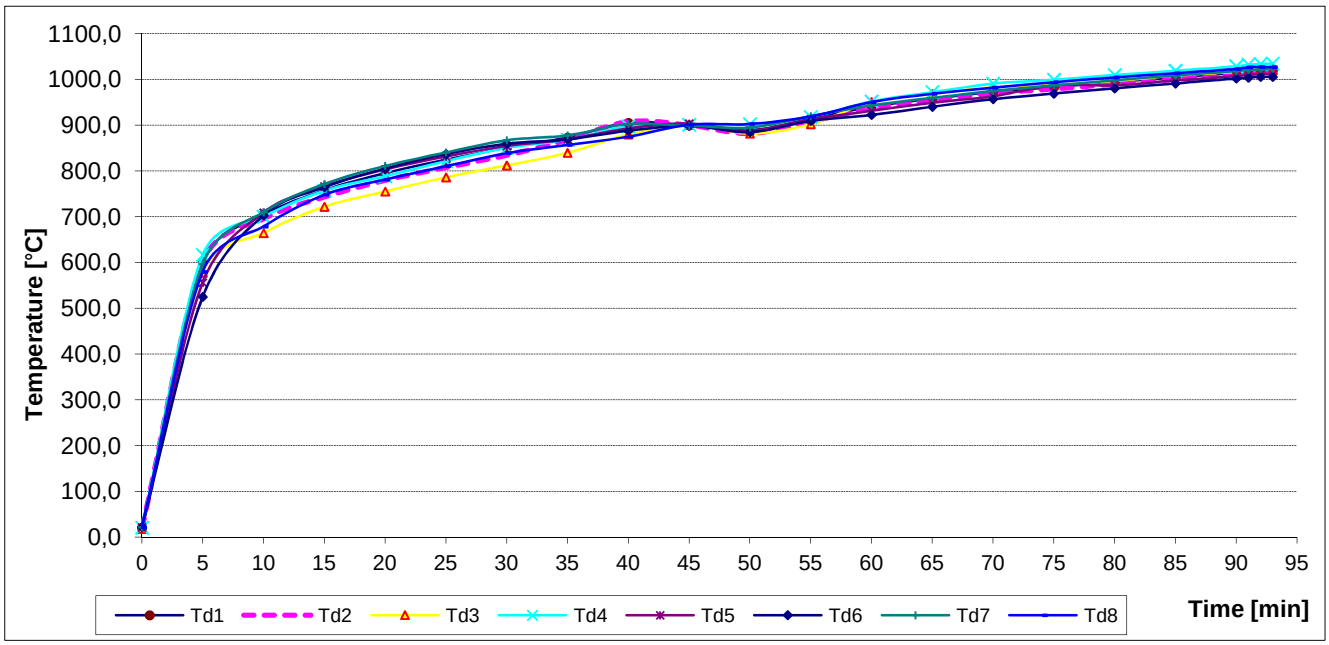
Time	Temperature [°C]											Deviation	Pressure
t [min]	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To	d_e [%]	p [Pa]
0	20,4	19,0	18,3	20,8	21,3	22,1	21,7	21,7	20,7	20,0	19,6	0,0	20,0
5	598,8	601,0	578,0	616,6	556,2	525,1	596,6	580,0	581,5	576,0	18,5	-2,1	17,6
10	702,8	695,6	664,4	700,1	708,9	702,8	710,0	678,7	695,4	678,0	17,6	0,1	18,8
15	757,5	743,5	722,0	756,9	766,4	764,7	771,5	748,1	753,8	739,0	18,5	0,6	19,3
20	795,4	779,7	755,3	788,7	803,5	805,5	811,1	781,4	790,1	781,0	17,9	0,9	18,1
25	824,3	807,9	786,2	821,6	831,6	837,1	840,6	810,5	820,0	815,0	19,3	0,8	19,3
30	851,0	834,6	812,1	850,8	854,6	859,4	867,4	839,1	846,1	842,0	19,0	0,8	19,3
35	873,0	868,0	839,8	868,3	869,5	869,1	877,9	856,8	865,3	865,0	18,7	0,7	17,3
40	905,3	908,0	880,1	897,8	893,0	888,1	902,6	875,0	893,7	885,0	18,9	0,7	19,2
45	899,7	900,3	901,2	901,0	903,5	898,6	899,0	901,2	900,6	902,0	19,0	0,7	19,5
50	888,8	882,3	881,9	902,3	888,6	885,0	895,2	902,8	890,9	918,0	18,2	0,3	19,8
55	913,9	907,9	902,3	918,2	913,1	909,5	919,9	919,2	913,0	932,0	18,7	0,0	17,6
60	940,7	937,7	950,7	952,0	931,4	922,4	943,6	950,8	941,2	945,0	18,5	-0,1	17,0
65	957,8	955,7	968,6	972,4	949,1	940,4	959,8	968,9	959,1	957,0	19,2	-0,1	18,2
70	972,7	970,4	982,8	991,0	963,4	957,1	974,9	982,3	974,3	968,0	18,4	0,0	18,1
75	983,4	979,4	988,3	999,5	986,9	969,1	987,3	994,4	986,0	979,0	18,8	0,0	17,4
80	994,3	990,0	996,8	1009,8	987,4	980,6	998,5	1004,7	995,3	988,0	18,8	0,1	19,1
85	1004,5	1000,4	1008,4	1019,2	997,8	991,4	1008,6	1013,8	1005,5	997,0	19,0	0,1	18,7
90	1014,6	1010,5	1016,8	1028,9	1007,8	1002,0	1018,6	1023,1	1015,3	1006,0	19,4	0,2	17,7
91	1017,1	1013,3	1020,2	1032,6	1010,1	1003,9	1020,8	1026,9	1018,1	1008,0	19,4	0,2	18,9
92	1018,4	1014,6	1024,0	1034,0	1011,8	1005,5	1022,2	1027,5	1019,8	1009,0	18,0	0,2	19,9
93	1020,4	1017,2	1020,6	1034,6	1011,7	1005,7	1023,5	1027,0	1020,1	1011,0	19,4	0,2	17,9

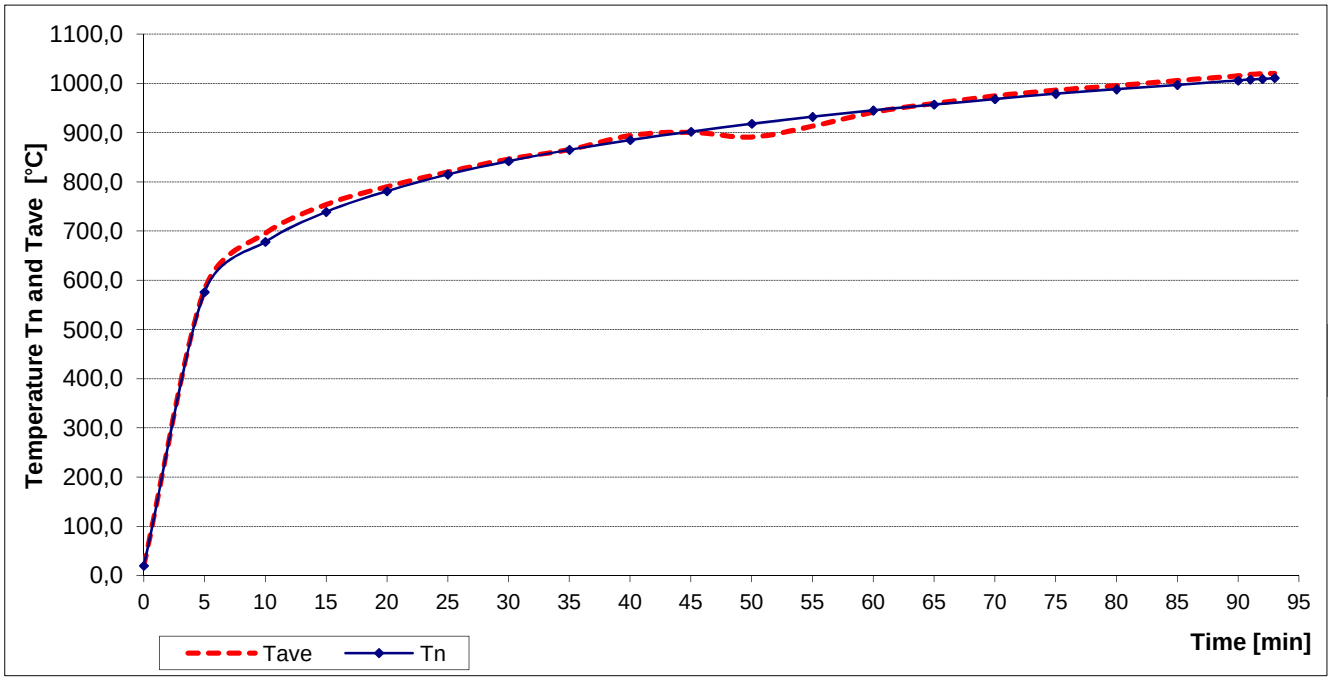
Tave Average temperature in the test furnace calculated from plate thermometers
Tn Standard temperature in the test furnace laid down to test guideline
To Ambient temperature
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline
p Pressure inside the test furnace measured under the ceiling of the test furnace

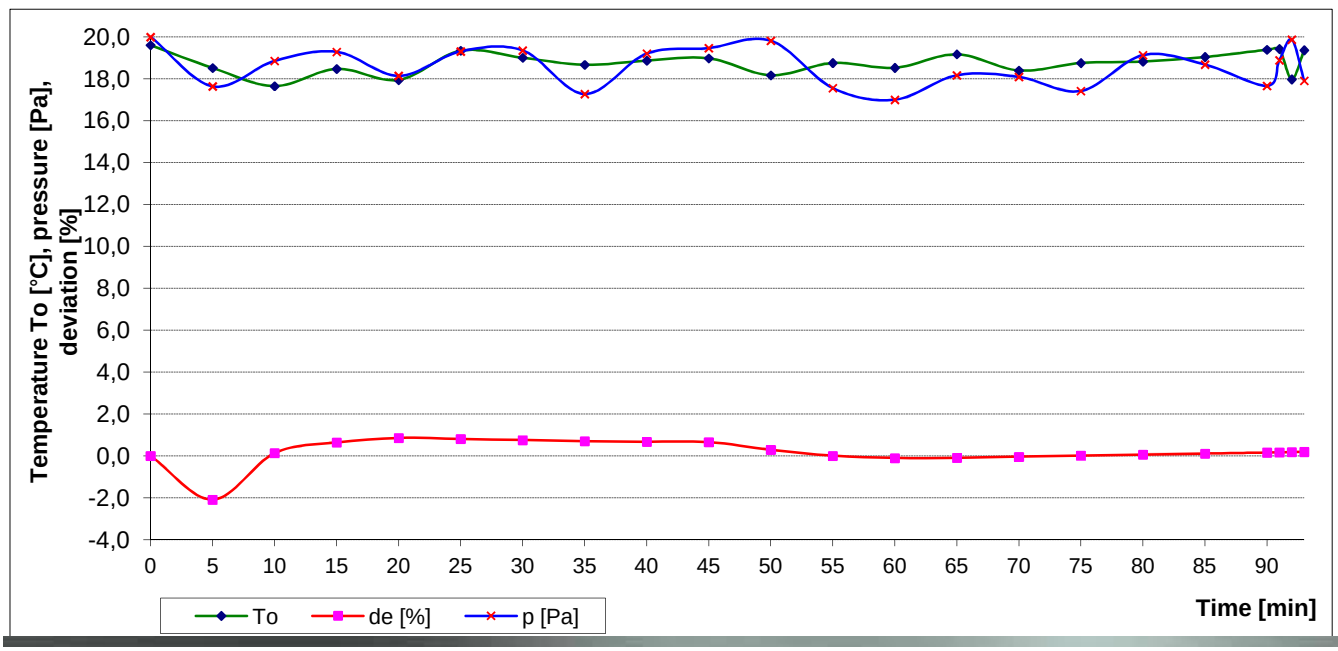
Layout of measuring points inside the test furnace:



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	53:57
	3-L3	53:57
	4-PEN	x
S2	5-L1	no failure / interruption
	6-L2	no failure / interruption
	7-L3	no failure / interruption
	8-PEN	no failure / interruption
S3	9-L1	no failure / interruption
	10-L2	no failure / interruption
	11-L3	no failure / interruption
	12-PEN	no failure / interruption
S4	13-L1	84:44
	14-L2	84:44
	15-L3	84:44
	16-PEN	x
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	no failure / interruption
	26-L2	no failure / interruption
	27-L3	no failure / interruption
	28-PEN	no failure / interruption
S8	29-L1	no failure / interruption
	30-L2	no failure / interruption
	31-L3	no failure / interruption
	32-PEN	no failure / interruption
S9	33-L1	61:06
	34-L2	61:06
	35-L3	61:06
	36-PEN	x
S10	37-L1	60:05
	38-L2	60:05
	39-L3	60:05
	40-PEN	x

Specimen No.	Cables
1	cable (N)HXH 4x50RM FE180/E90 0,6/1kV
2	cable (N)HXH 4x50RM FE180/E90 0,6/1kV
3	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
4	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
5	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
6	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
7	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV
8	cable (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV
9	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
10	cable (N)HXCH 4x1,5RE/1,5 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	no failure / interruption
	58-L2	no failure / interruption
	59-L3	no failure / interruption
	60-PEN	no failure / interruption
S16	61-L1	no failure / interruption
	62-L2	no failure / interruption
	63-L3	no failure / interruption
	64-PEN	no failure / interruption
S17	65-L1	no failure / interruption
	66-L2	no failure / interruption
	67-L3	no failure / interruption
	68-PEN	no failure / interruption
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 (N)HXH 4x1,5RE FE180/E90 0,6/1kV + fireboxes PMO2
16	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV
17	cable NHXCH 4x50RM/25 FE180/E90 0,6/1kV
18	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
19	cable NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
20	cable NHXH 4x50RM FE180/E90 0,6/1kV

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	no failure / interruption
	82-L2	no failure / interruption
	83-L3	no failure / interruption
	84-PEN	no failure / interruption
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	no failure / interruption
	98-L2	no failure / interruption
	99-L3	no failure / interruption
	100-PEN	no failure / interruption
S26	101-L1	88:09
	102-L2	x
	103-L3	x
	104-PEN	x
S27	105-L1	no failure / interruption
	106-L2	no failure / interruption
	107-L3	no failure / interruption
	108-PEN	no failure / interruption
S28	109-L1	x
	110-L2	x
	111-L3	31:26
	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	x
	118-L2	x
	119-L3	84:54
	120-PEN	x

Specimen No.	Cables
21	cable NHXH 4x50RM FE180/E90 0,6/1kV
22	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
23	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
24	cable NHXH 4x50RM FE180/E90 0,6/1kV
25	cable NHXH 4x50RM FE180/E90 0,6/1kV
26	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
27	cable NHXH 4x1,5RE FE180/E90 0,6/1kV
28	cable (N)HXH 4x50RM FE180/E90 0,6/1kV
29	cable (N)HXH 4x50RM FE180/E90 0,6/1kV
30	cable (N)HXH 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 S31 to S40 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S31	121-L1	x
	122-L2	x
	123-L3	89:46
	124-PEN	x
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	x
	134-L2	x
	135-L3	50:24
	136-PEN	x
S35	137-L1	69:02
	138-L2	69:02
	139-L3	69:02
	140-PEN	x
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	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
32	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
33	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV
34	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
35	cable (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
36	cable (N)HXH 4x6RE FE180/E90 0,6/1kV + fireboxes PMO2
37	cable (N)HXH 4x6RE FE180/E90 0,6/1kV + fireboxes PMO1
38	cable (N)HXH 4x1,5RE FE180/E90 0,6/1kV+ fireboxes PMO1
39	2 cables NHXCH 4x50RM/25 FE180/E90 0,6/1kV
40	2 cables NHXCH 4x1,5RE/1,5 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 S50 - 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	67:45
	174-L2	67:45
	175-L3	67:45
	176-PEN	x
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	x
	186-L2	85:40
	187-L3	x
	188-PEN	x
S48	189-L1	63:31
	190-L2	63:31
	191-L3	63:31
	192-PEN	x
S49	193-L1	68:47
	194-L2	68:47
	195-L3	x
	196-PEN	x
S50	197-L1	no failure / interruption
	198-L2	no failure / interruption
	199-L3	no failure / interruption
	200-PEN	no failure / interruption

Specimen No.	Cables
41	2 cables NHXH 4x50RM FE180/E90 0,6/1kV
42	2 cables NHXH 4x1,5RE FE180/E90 0,6/1kV
43	2 cables (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV
44	2 cables (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
45	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV
46	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV
47	2 cables (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV
48	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV
49	2 cables (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV
50	2 cables (N)HXH 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	73:47
	210-PEN	x
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
S55	221-L	no failure / interruption
	222-PEN	no failure / interruption
	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	77:49
	230-PEN	x
S57B	231-L	77:50
	232-PEN	x
S58A	233-L	51:18
	234-PEN	x
S58B	235-L	52:41
	236-PEN	x
S59A	237-L	no failure / interruption
	238-PEN	no failure / interruption
S59B	239-L	06:06
	240-PEN	x
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	57:13
	248-PEN	x

Specimen No.	Cables
52A, 57, 60A	2 cables HTKSHekw 1x2x0,8 FE180/PH90/E90 225V
52B, 61A	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V
53A	2 cables BiTflame S(St) 2x1,0 FE180/PH90/E90 300/500V
53B	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V
54A	2 cables BiTflame S 2x1,0 FE180/PH90/E90 300/500V
54B, 59A, 61B	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V
55	cable JE-H(St)H 2x2x0,8 FE180/E90 225V + fireboxes PMO2
56	cable HTKSH 1x2x0,8 FE180/E90 225V + fireboxes PMO2
58, 59B, 60B	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V

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 diods 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	36:58
	252-PEN	x
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	73:21
	264-PEN	x
S66A	265-L	88:53
	266-PEN	x
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	42:18
	274-PEN	x
S68B	275-L	41:38
	276-PEN	x
S69A	277-L	no failure / interruption
	278-PEN	no failure / interruption
S69B	279-L	68:28
	280-PEN	x
S70A	281-L	no failure / interruption
	282-PEN	no failure / interruption
S70B	283-L	no failure / interruption
	284-PEN	no failure / interruption
S71	285-L	no failure / interruption
	286-PEN	no failure / interruption
	287-L	no failure / interruption
	288-PEN	no failure / interruption

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

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 diods 3V / 0,03W.
Circuit breakers with rating 3 A were used.

Measured time of tested specimens S72 to S74 - 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	no failure / interruption
	296-PEN	no failure / interruption
S74A	297-L	no failure / interruption
	298-PEN	no failure / interruption
S74B	299-L	no failure / interruption
	300-PEN	no failure / interruption

Specimen No.	Cables
72	cable HTKSH 1x2x0,8 FE180/E90 225V + fireboxes PMO1
73	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V
74	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V

Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 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.

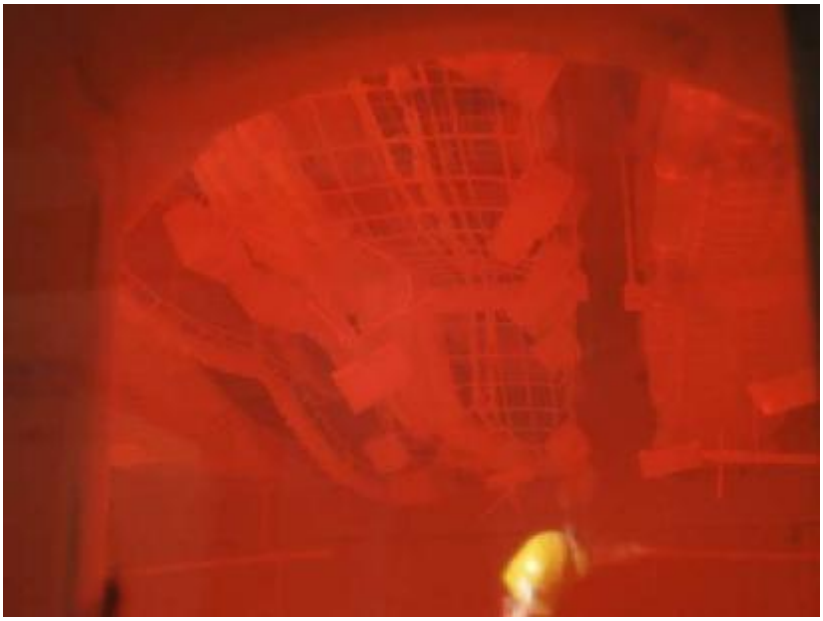


Photo taken during the test.

Photo taken during the test.

PHOTOS

Photo taken after the test.

Photo taken after the test.

Photo taken after the test.

PHOTOS

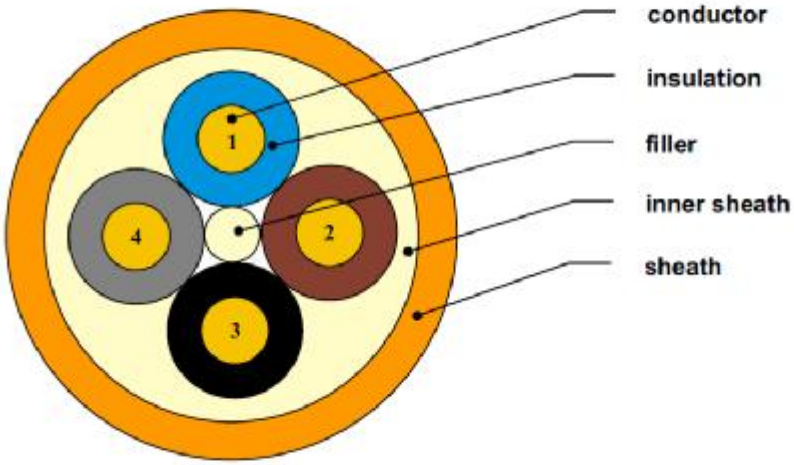
Photo taken after the test.

Photo taken after the test.

Photo taken after the test.

(N)HXH 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
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 ÷ 240
7 ÷ 10	1,5 ÷ 10
10 ÷ 48	1,5 ÷ 2,5

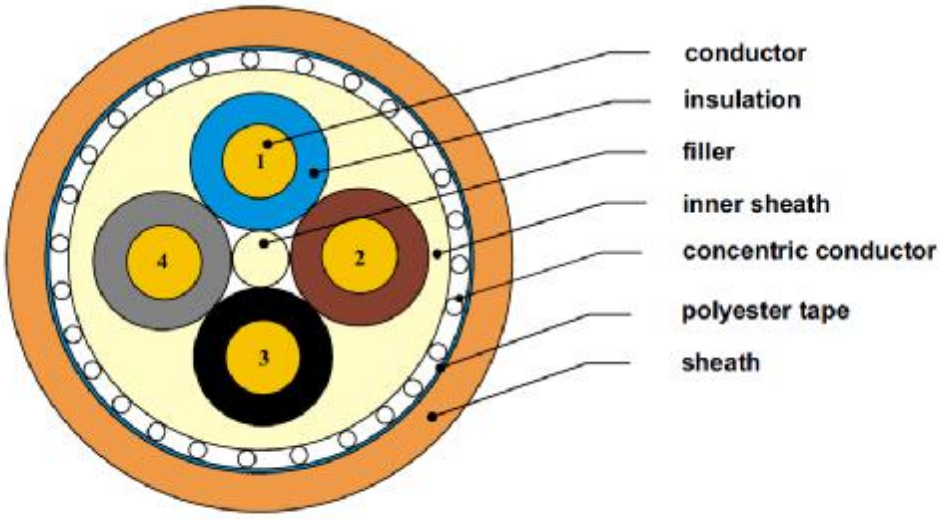
Operating voltage	0,6/1kV
Voltage test	4000 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{12}

Operating temperature range during operation during installation	 -25°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)HXCH FE180/E90

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

Safety cables are used in all locations where a special protection against firhhe 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 coper 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

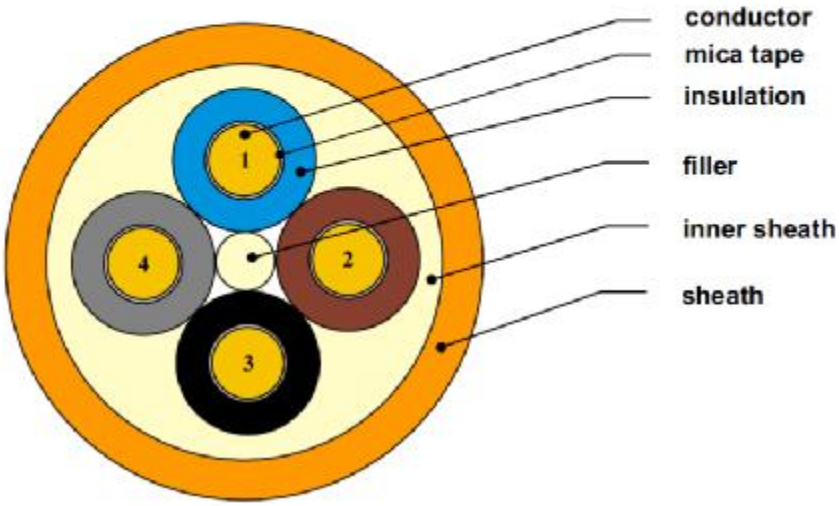
Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm^2
1 ÷ 4	1,5/1,5 ÷ 240/120
7	1,5/1,5 ÷ 4/4
10 ÷ 30	1,5/2,5 ÷ 2,5/10

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	-25°C up to +90°C
during installation	-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

NHXH 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 - 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

NHXH 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

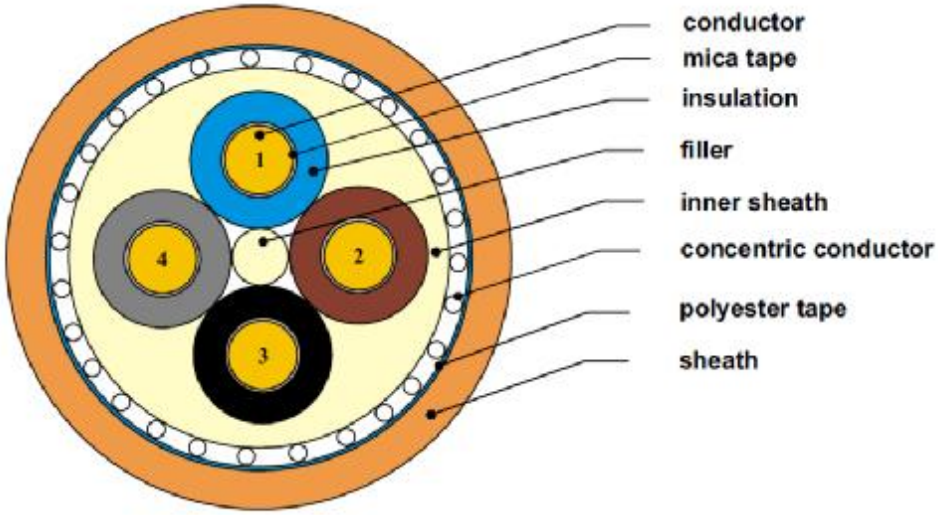
Operating voltage	0,6/1kV
Voltage test	4000 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{12}

Operating temperature range during operation during installation	 -25°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 firhhe 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 coper 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

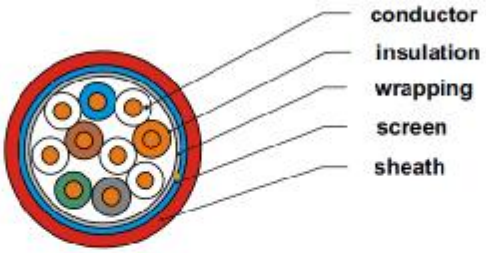
Operating voltage	0,6/1 kV
Voltage test	4000 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{12}

Operating temperature range during operation	-25°C up to +90°C
during installation	-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

BiT flame AS(St) FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMUNICATIONS 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 soild, 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

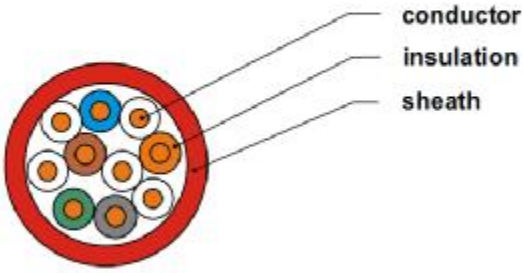
Operating voltage	225V
Voltage test	
core/core	1500 V, 50 Hz
core/screen	1500 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range	
during operation	-25°C up to +70°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

BiT flame AS FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMUNICATIONS 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

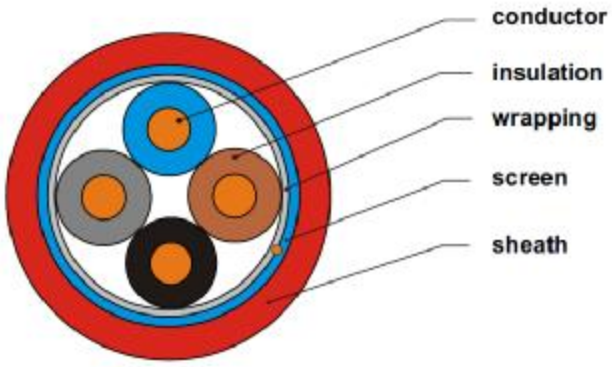
Operating voltage	225V
Voltage test core/core	1500 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range during operation during installation	-25°C up to +70°C -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

BiT flame S(St) FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE POWER AND CONTROL CABLE



APPLICATIONS

Halogen-free fire resistant cables are designed for instalation in places where it is necessary to ensure operation of devices under fire conditions.There are recommended for emergency lighting instalations, 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

BiT flame S(St) 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

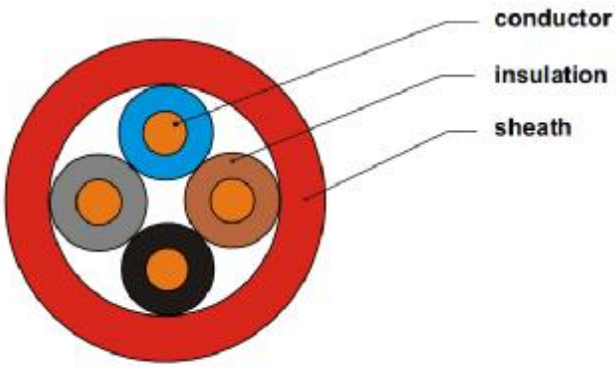
Operating voltage	300/500 V
Voltage test	
core/core	2000 V, 50 Hz
core/screen	2000 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range	
during operation	-25°C up to +70°C
during installation	-10°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-03-2002

CABLES

BiT flame S FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE POWER AND CONTROL CABLE



APPLICATIONS

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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

BiT flame S 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

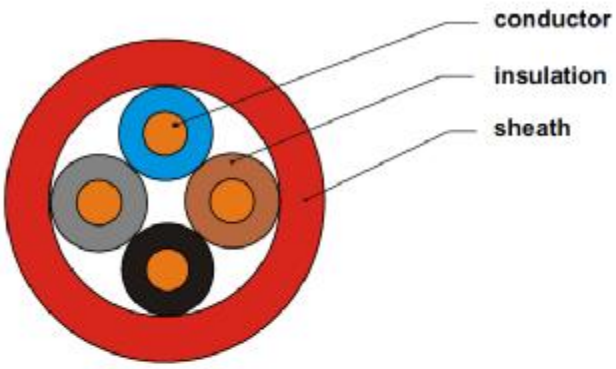
Operating voltage	300/500 V
Voltage test	
core/core	2000 V, 50 Hz
core/screen	2000 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range	
during operation	-25°C up to +70°C
during installation	-10°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-03-2002

CABLES

HDGs FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE POWER AND CONTROL CABLE



APPLICATIONS

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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

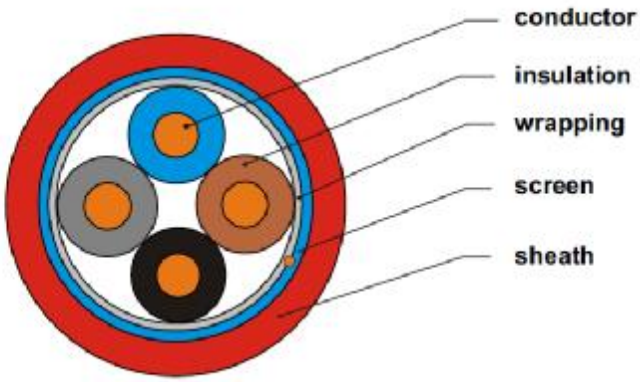
Operating voltage	300/500 V
Voltage test	
core/core	2000 V, 50 Hz
core/screen	2000 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range	
during operation	-25°C up to +70°C
during installation	-10°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-03-2002

CABLES

HDGsekwf FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE POWER AND CONTROL CABLE



APPLICATIONS

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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

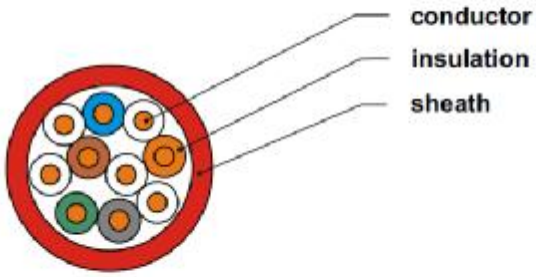
Conductor cross-section	
Number of conductors	Nominal conductor cross-section
n	mm^2
2 ÷ 5	1 ÷ 10
6 ÷ 37	1 ÷ 2,5

Operating voltage	300/500 V
Voltage test	
core/core	2000 V, 50 Hz
core/screen	2000 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range	
during operation	-25°C up to +70°C
during installation	-10°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-03-2002

HTKSH FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMUNICATIONS 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

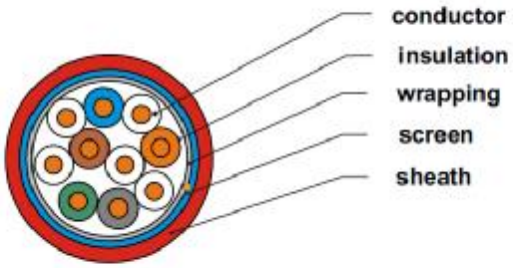
Operating voltage	225V
Voltage test core/core	1500 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range during operation during installation	-25°C up to +70°C -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 50265:2006 IEC 60332-3
Reference standards	ZN-CB-25-2005

CABLES

HTKSHekw FE180/PH90/E90

FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMUNICATIONS 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 soild, 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

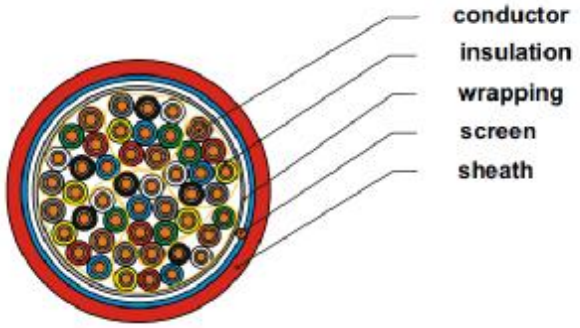
Operating voltage	225V
Voltage test	
core/core	1500 V, 50 Hz
core/screen	1500 V, 50 Hz
Insulation resistivity at 90°C, minimum	10^{11}

Operating temperature range	
during operation	-25°C up to +70°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

JE-H(St)H MIKA FE180/E90

FIRE RESISTANT HALOGEN FREE ELECTRONIC AND TELECOMUNICATIONS CABLE



APPLICATIONS

Safety installations cables are used for the transmission od 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 soild, 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

DRAWINGS

Nr	Nr Fires	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
1	46		(N)HXH 4x1,5RE FE180/E90 0,6/1kV	1	Korytko kablowe KGL/KGOL 300H60/... B-300 1.5 m /20kg/m / grubość blachy 0,7 mm Mocowanie : Wspornik WPC/WPCO1000, Wysięgnik WMC/WMCO400 , pręt gwintowany PG M10 za pomocą uchwytu USV/USOV
2			(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
3	45		(N)HXH 4x50RM FE180/E90 0,6/1kV		
4			(N)HXH 4x50RM FE180/E90 0,6/1kV		
5	70		HDGs 2x1,0 FE180/PH/90/E90 300/500V		
6			HDGs 2x1,0 FE180/PH90/E90 300/500V		
7	44		(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 : Wspornik WPC/WPCO1000, Wysięgnik WMC/WMCO400 , pręt gwintowany PG M10 za pomocą uchwytu USV/USOV
8			(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
9	43		(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		
10			(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		
11	69		HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
12			HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
13	42		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 : Wspornik WPC/WPCO1000, Wysięgnik WMC/WMCO400 , pręt gwintowany PG M10 za pomocą uchwytu USV/USOV
14			NHXH 4x1,5RE FE180/E90 0,6/1kV		
15	41		NHXH 4x50RM FE180/E90 0,6/1kV		
16			NHXH 4x50RM FE180/E90 0,6/1kV		
17	68		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
18			HTKSH 1x2x0,8 FE180/PH90/E90 225V		
19	67		BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		
20			BiTflame AS 1x2x0,8 FE180/PH90/E90 225V		
21	40		NHXCH 4x1,5RM/1,5 FE180/E90 0,6/1kV	4	Korytko kablowe KGJ/KGOJ 400H60/... B-400 1.5 m /20kg/m / grubość blachy 0,9 mm Mocowanie : Wspornik WPC/WPCO1000, Wysięgnik WMC/WMCO400 , pręt gwintowany PG M10 za pomocą uchwytu USV/USOV
22			NHXCH 4x1,5RM/1,5 FE180/E90 0,6/1kV		
23	39		NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
24			NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
25	66		HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		
26			HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		
27	65		BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V		
28			BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V		
29	31		(N)HXH 4x1,5RE FE180/E90 0,6/1kV	5	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	30		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
31	29		(N)HXH 4x50RM FE180/E90 0,6/1kV		
32	28		(N)HXH 4x50RM FE180/E90 0,6/1kV		
33	61B		HDGs 2x1,0 FE180/E90 300/500V		
34			HDGs 2x1,0 FE180/E90 300/500V		
35	61A		HDGsekwf 2x1,0 FE180/E90 300/500V		
36			HDGsekwf 2x1,0 FE180/E90 300/500V		

DRAWINGS

Nr	Nr Fires	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
37	27		NHXH 4x1,5RE FE180/E90 0,6/1kV	6	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
38	26		NHXH 4x1,5RE FE180/E90 0,6/1kV		
39	25		NHXH 4x50RM FE180/E90 0,6/1kV		
40	24		NHXH 4x50RM FE180/E90 0,6/1kV		
41	60B		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
42			HTKSH 1x2x0,8 FE180/PH90/E90 225V		
43	60A		HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		
44			HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		
45	23		NHXH 4x1,5RE FE180/E90 0,6/1kV	7	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
46	22		NHXH 4x1,5RE FE180/E90 0,6/1kV		
47	21		NHXH 4x50RM FE180/E90 0,6/1kV		
48	20		NHXH 4x50RM FE180/E90 0,6/1kV		
49	58		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
50			HTKSH 1x2x0,8 FE180/PH90/E90 225V		
51	19		NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	8	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
52	18		NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
53	17		NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
54	16		NHXCH 4x50RM/25 FE180/E90 0,6/1kV		
55	57		HTKSHekw 1x2x0,8 FE180/PH90/E90		
56			HTKSHekw 1x2x0,8 FE180/PH90/E90		
57	12		(N)HXH 4x1,5RE FE180/E90 0,6/1kV	9	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
58	11		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
59	14		(N)HXH 4x50RM FE180/E90 0,6/1kV		
60	13		(N)HXH 4x50RM FE180/E90 0,6/1kV		
61	54B		HDGs 2x1,0 FE180/PH90/E90 300/500V		
62			HDGs 2x1,0 FE180/PH90/E90 300/500V		
63	54A		BiTflame S 2x1,0 FE180/PH90/E90 300/500V		
64			BiTflame S 2x1,0 FE180/PH90/E90 300/500V		
65	10		(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	10	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
66	9		(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
67	8		(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		
68	7		(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		
69	53B		HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
70			HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
71	53A		BiTflame S(St) 2x1,0 FE180/PH90/E90 300/500V		
72			BiTflame S(St) 2x1,0 FE180/PH90/E90 300/500V		

DRAWINGS

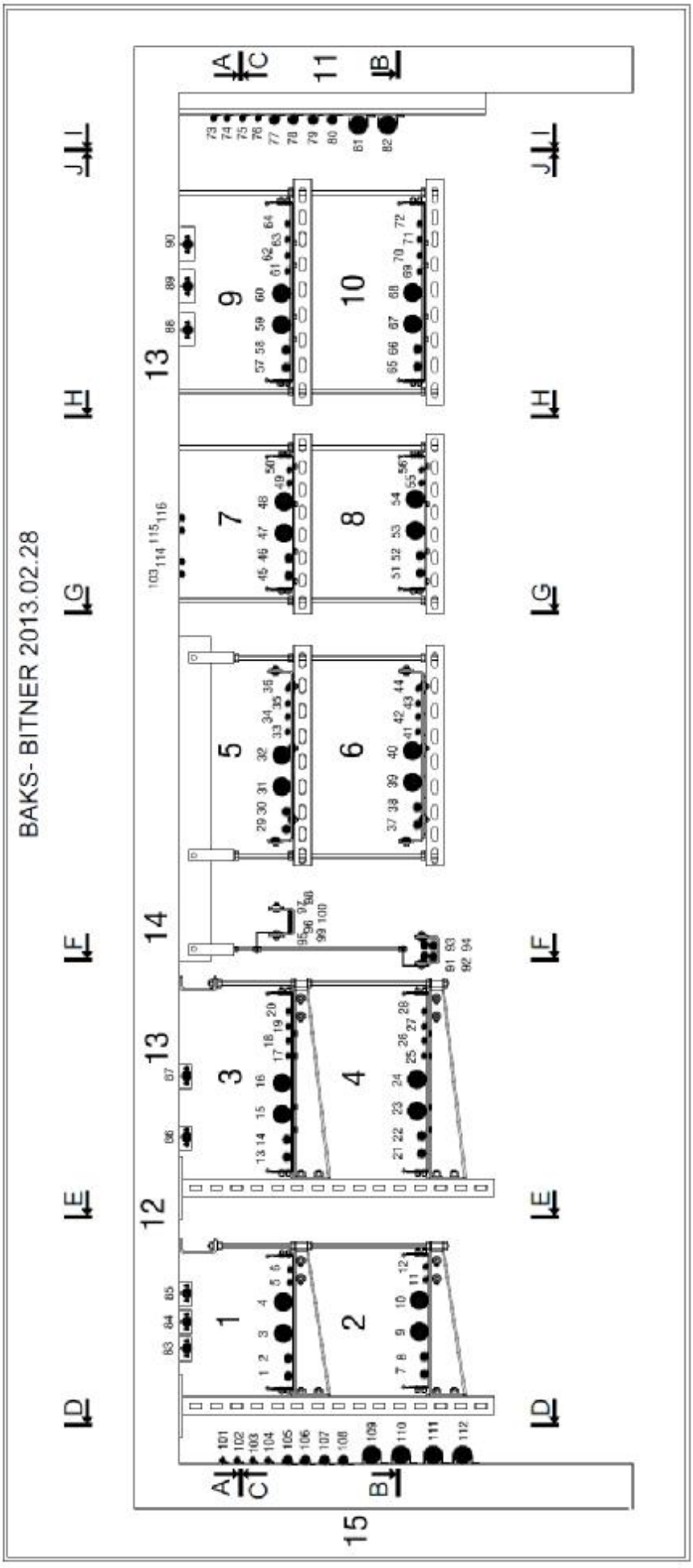
Nr	Nr Fires	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
73	52A		HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	11	Uchwyt kablowy UDF. Mocowanie do płyty gips karton co 600mm za pomocą kołka HM 5x37S
74			HTKSHekw 1x2x0,8 FE180/PH90/E90 225V		
75	52B		HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
76			HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
77	6		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
78	5		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
79	4		(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
80	3		(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
81	2		(N)HXH 4x50RM FE180/E90 0,6/1kV		
82	1		(N)HXH 4x50RM FE180/E90 0,6/1kV		
83	72		HTKSH 1x2x0,8 FE180/E90 225V	12	Obejma kablowa KSA Mocowanie co 300mm + puszki PMO1
84	38		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
85	71		JE-H(St)H 2x2x0,8 FE180/E90 225V		
86	37		(N)HXH 4x6RE FE180/E90 0,6/1kV		
87	36		(N)HXH 4x6RE FE180/E90 0,6/1kV	13	Obejma kablowa KSA Mocowanie co 300mm + puszki PMO2
88	56		HTKSH 1x2x0,8 FE180/E90 225V		
89	15		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
90	55		JE-H(St)H 2x2x0,8 FE180/E90 225V		
91	35		(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	14	Korytko siatkowe KDS/ KDSO 60H60/... B-60 1.5 m /2kg/m / grubość drutu fi 4,5 mm Mocowanie : WKS60, pręt gwintowany PG M6. Wieszak trapezowy WT 120 + pręt gwintowany PG M6 mocowany do blachy trapezowej
92	34		(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
93	33		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
94	32		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
95	64		HDGs 2x1,0 FE180/PH90/E90 300/500V		
96			HDGs 2x1,0 FE180/PH90/E90 300/500V		
97	63		HTKSH 1x2x0,8 FE180/PH90/E90 225V		
98			HTKSH 1x2x0,8 FE180/PH90/E90 225V		
99	62		HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
100			HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		
101	74		HTKSH 1x2x0,8 FE180/PH90/E90 225V	15	Uchwyt kablowy UDF. Mocowanie do Ytonga co 600mm za pomocą kołka FMD 6x32
102			HTKSH 1x2x0,8 FE180/PH90/E90 225V		
103	73		HDGs 2x1,0 FE180/PH90/E90 300/500V		
104			HDGs 2x1,0 FE180/PH90/E90 300/500V		
105	50		(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
106			(N)HXH 4x1,5RE FE180/E90 0,6/1kV		
107	49		(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
108			(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		
109	48		(N)HXH 4x50RM FE180/E90 0,6/1kV		Uchwyt kablowy UDF. Mocowanie do Ytonga co 600mm za pomocą kołka FMD 6x40
110			(N)HXH 4x50RM FE180/E90 0,6/1kV		
111	47		(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		
112			(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV		

DRAWINGS

Nr	Nr Fires	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
113	59B		HTKSH 1x2x0,8 FE180/PH90/E90 225V – test	16	Uchwyt kablowy UDF. Mocowanie co 600mm
114			HTKSH 1x2x0,8 FE180/PH90/E90 225V – test		
115	59A		HDGs 2x1,0 FE180/PH90/E90 300/500V – test		
116			HDGs 2x1,0 FE180/PH90/E90 300/500V – test		

Lp.	Symbol kabla	Ilosć [szt.]	Średnica [mm]	Ciężar kabla [kg/m]
1	NHXH 4x1,5RE FE180/E90 0,6/1kV	6	14,9	0,31
2	NHXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	4	15,7	0,35
3	NHXH 4x50RM FE180/E90 0,6/1kV	6	36,9	3,05
4	NHXCH 4x50RM/25 FE180/E90 0,6/1kV	4	39,8	3,30
5	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	14	13,1	0,24
6	(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	10	14,7	0,30
7	(N)HXH 4x50RM FE180/E90 0,6/1kV	10	34,9	2,85
8	(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	6	36,9	3,10
9	(N)HXH 4x6RE FE180/E90 0,6/1kV	2	17,9	0,55
10	HTKSH 1x2x0,8 FE180/PH90/E90 225V	14	6,1	0,04
11	HTKSHekw 1x2x0,8 FE180/PH90/E90 225V	8	7,4	0,06
12	HDGs 2x1,0 FE180/PH90/E90 300/500V	12	6,8	0,06
13	HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	10	7,1	0,07
14	BiTflame AS 1x2x0,8 FE180/PH90/E90 225V	2	6,1	0,04
15	BiTflame AS(St) 1x2x0,8 FE180/PH90/E90 225V	2	7,4	0,06
16	BiTflame S 2x1,0 FE180/PH90/E90 300/500V	2	6,8	0,06
17	BiTflame S(St) 2x1,0 FE180/PH90/E90 300/500V	2	7,1	0,07
18	JE-H(St)H 2x2x0,8 FE180/E90	2	9,5	0,09

DRAWINGS



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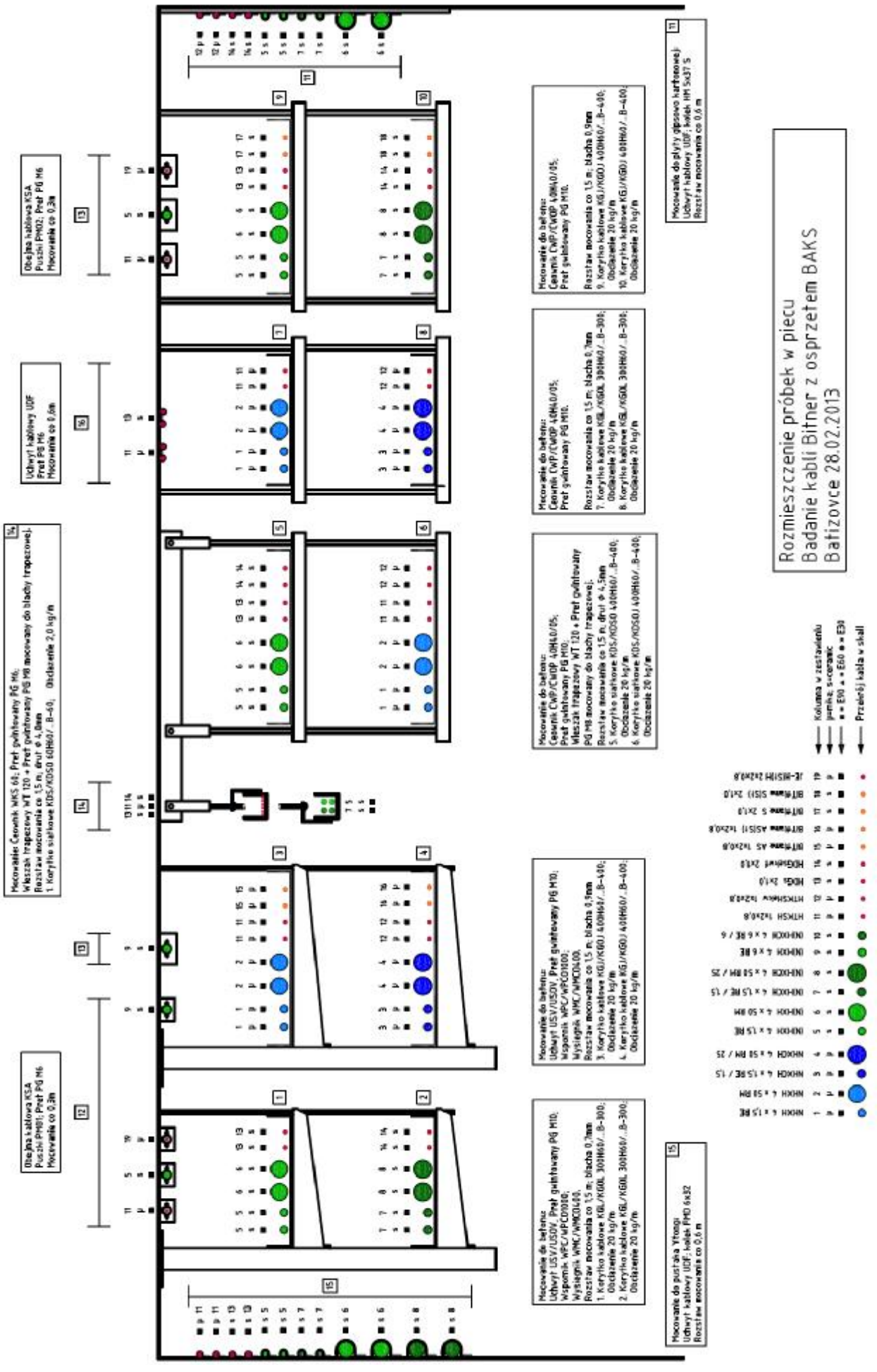
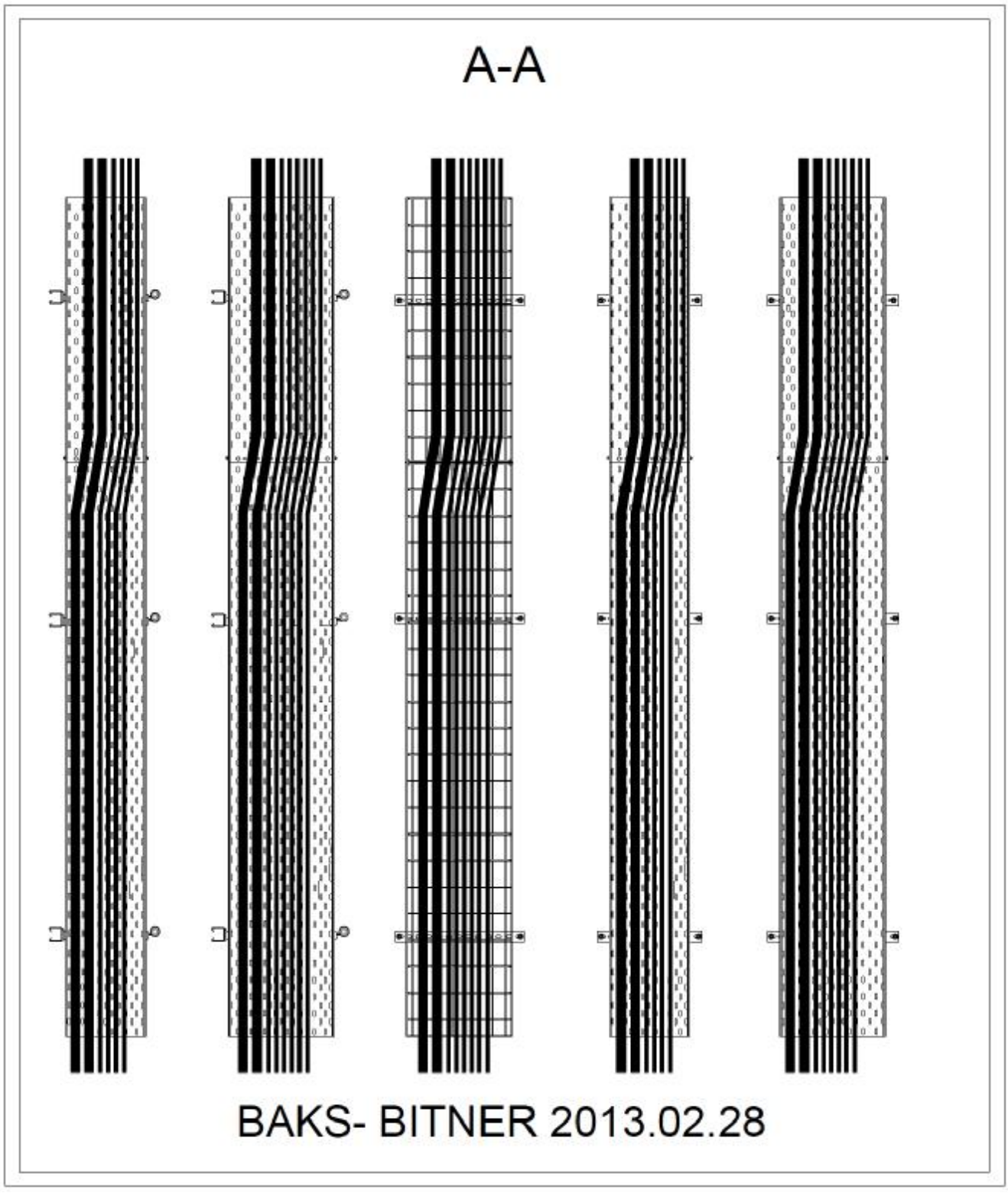

Rozmieszczenie próbek w piecu
Badanie kabli Bitner z osprzetem BAKS
Bałtzovce 28.02.2013

DRAWINGS



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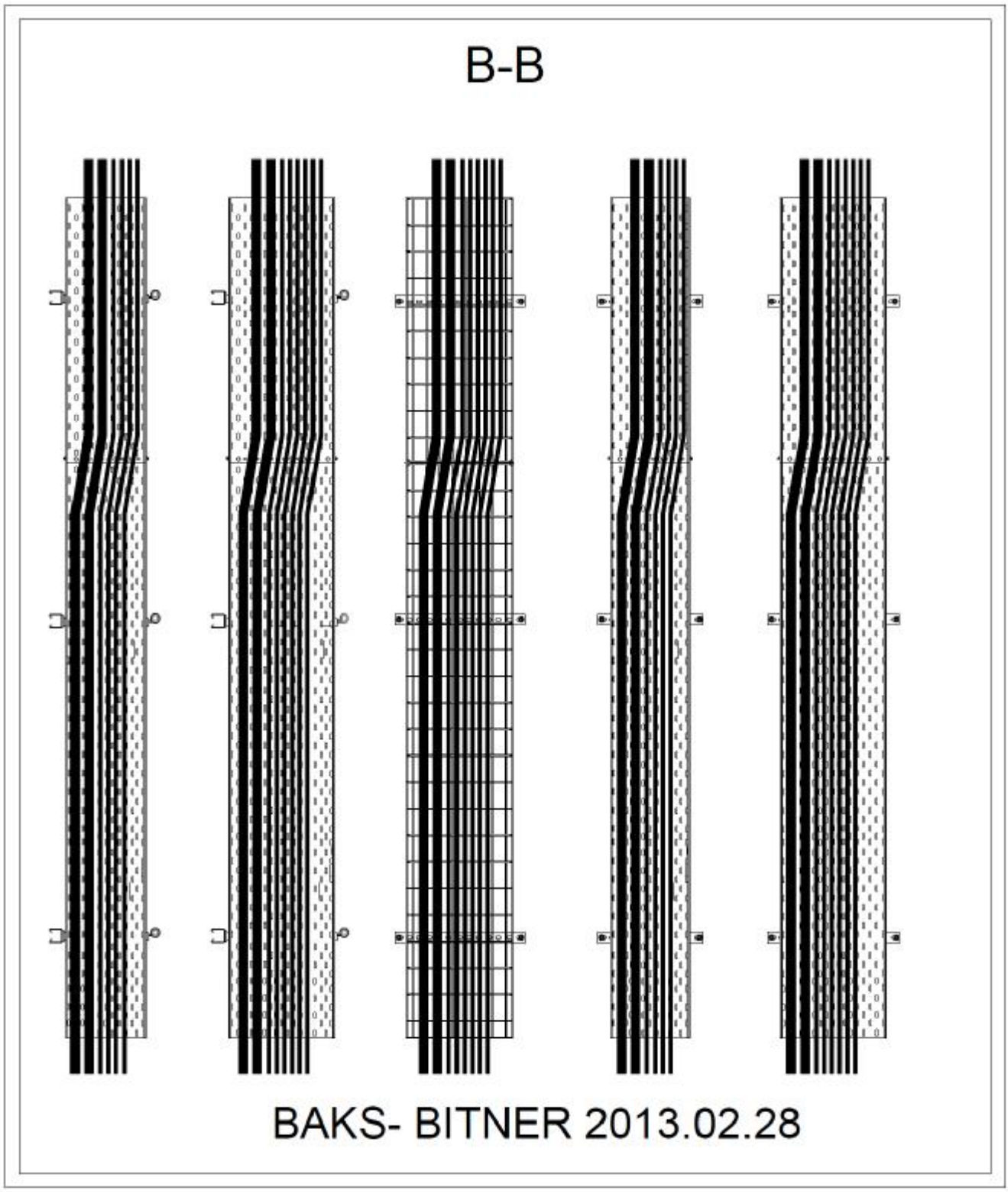

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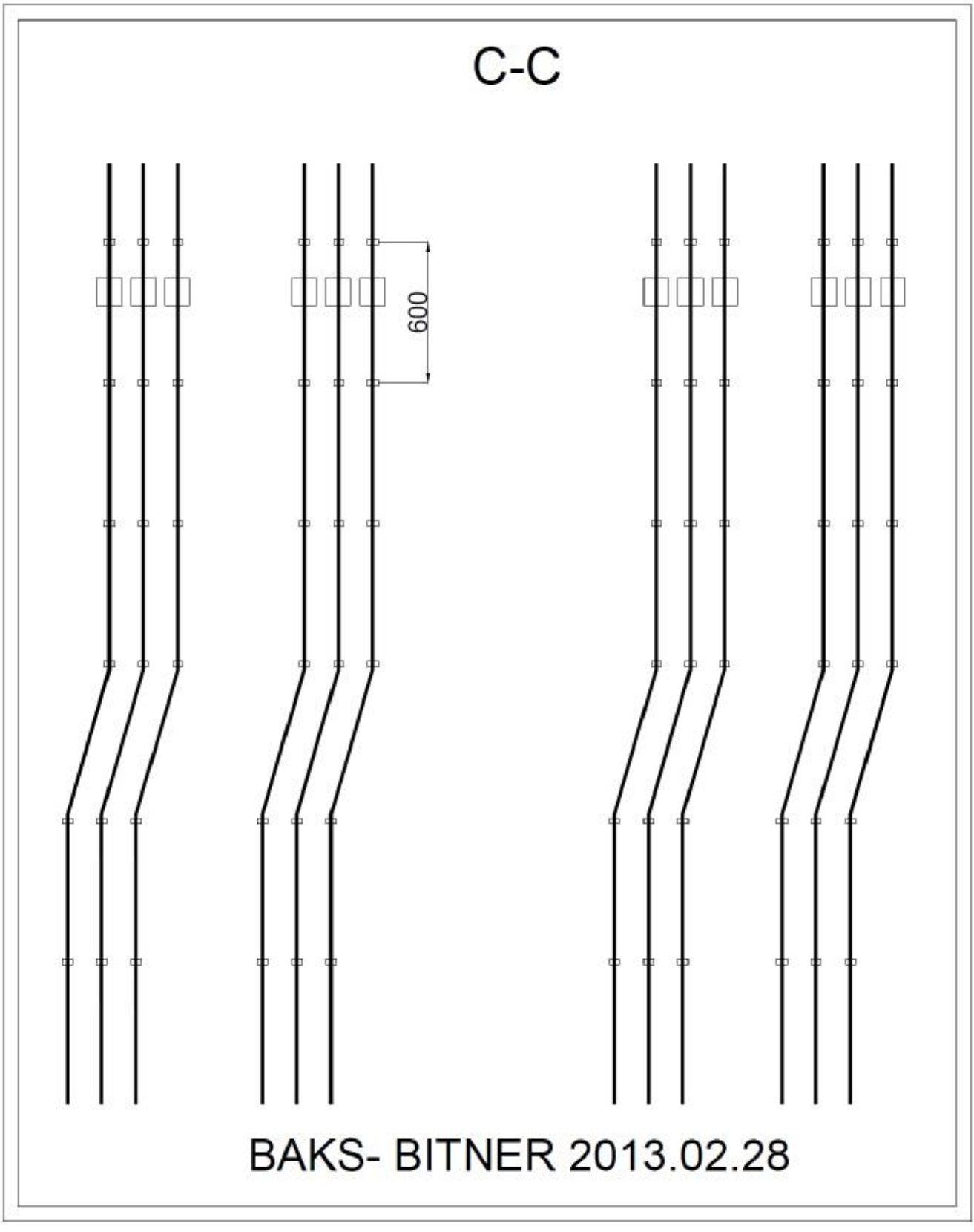

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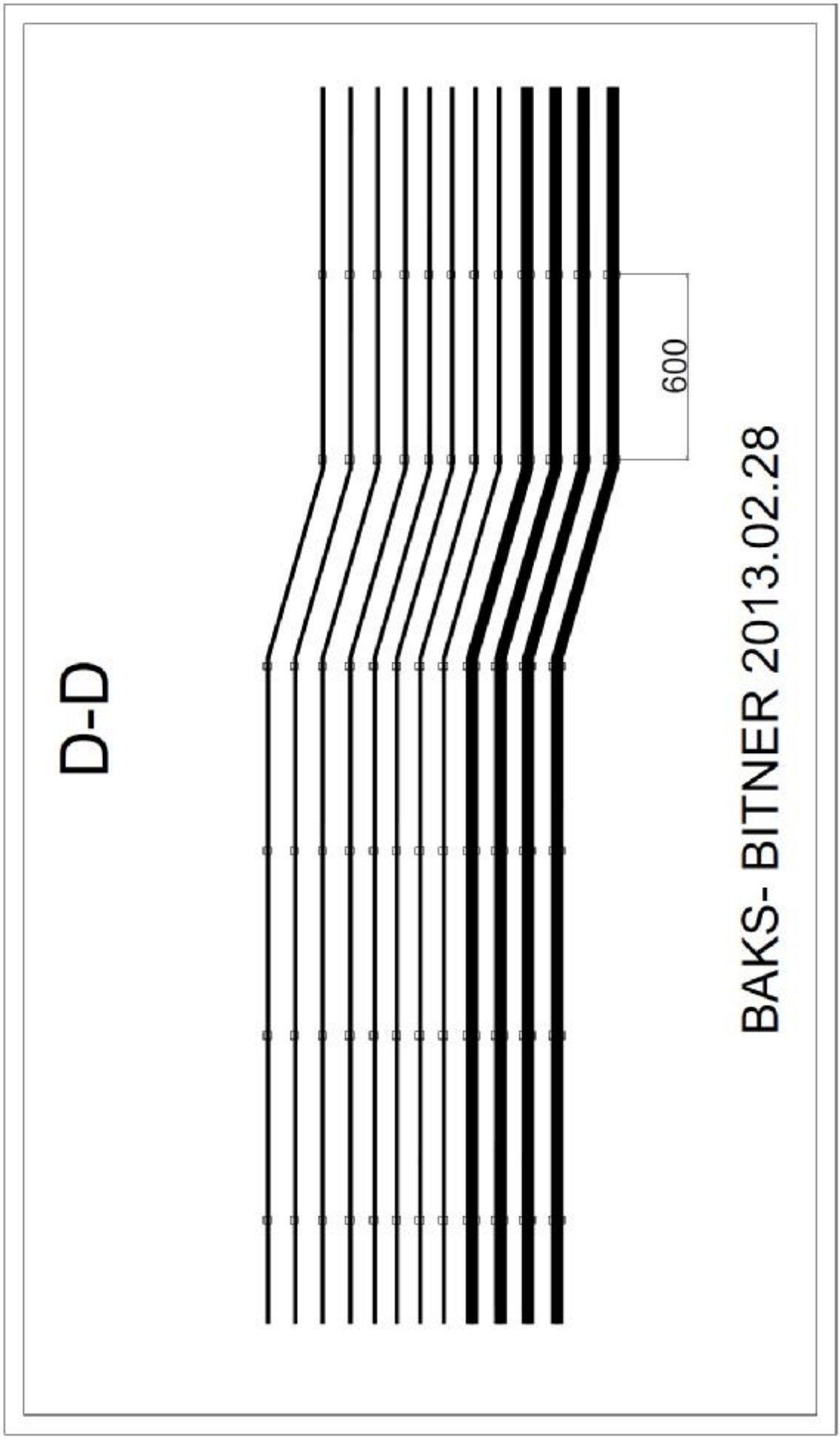

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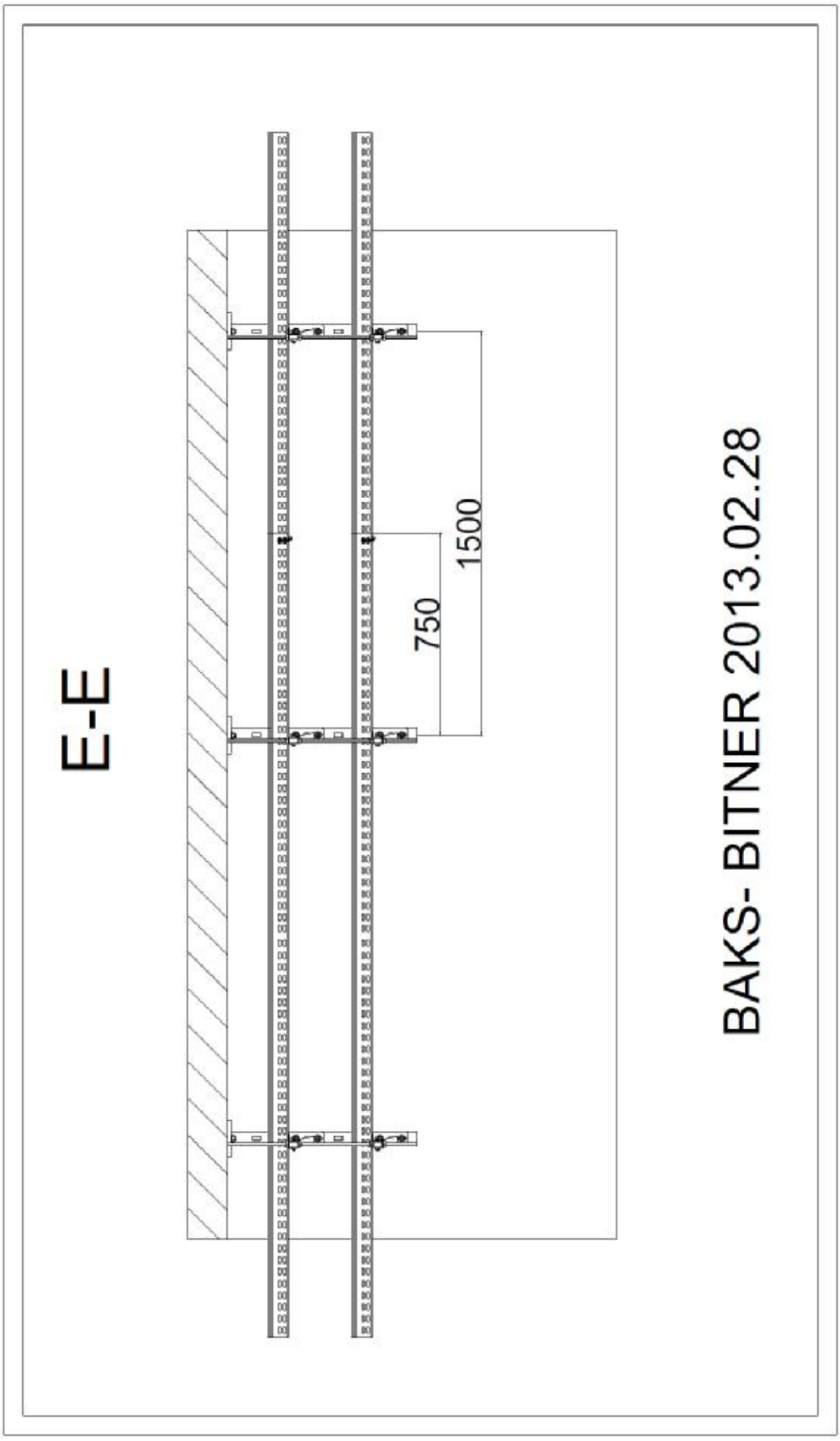

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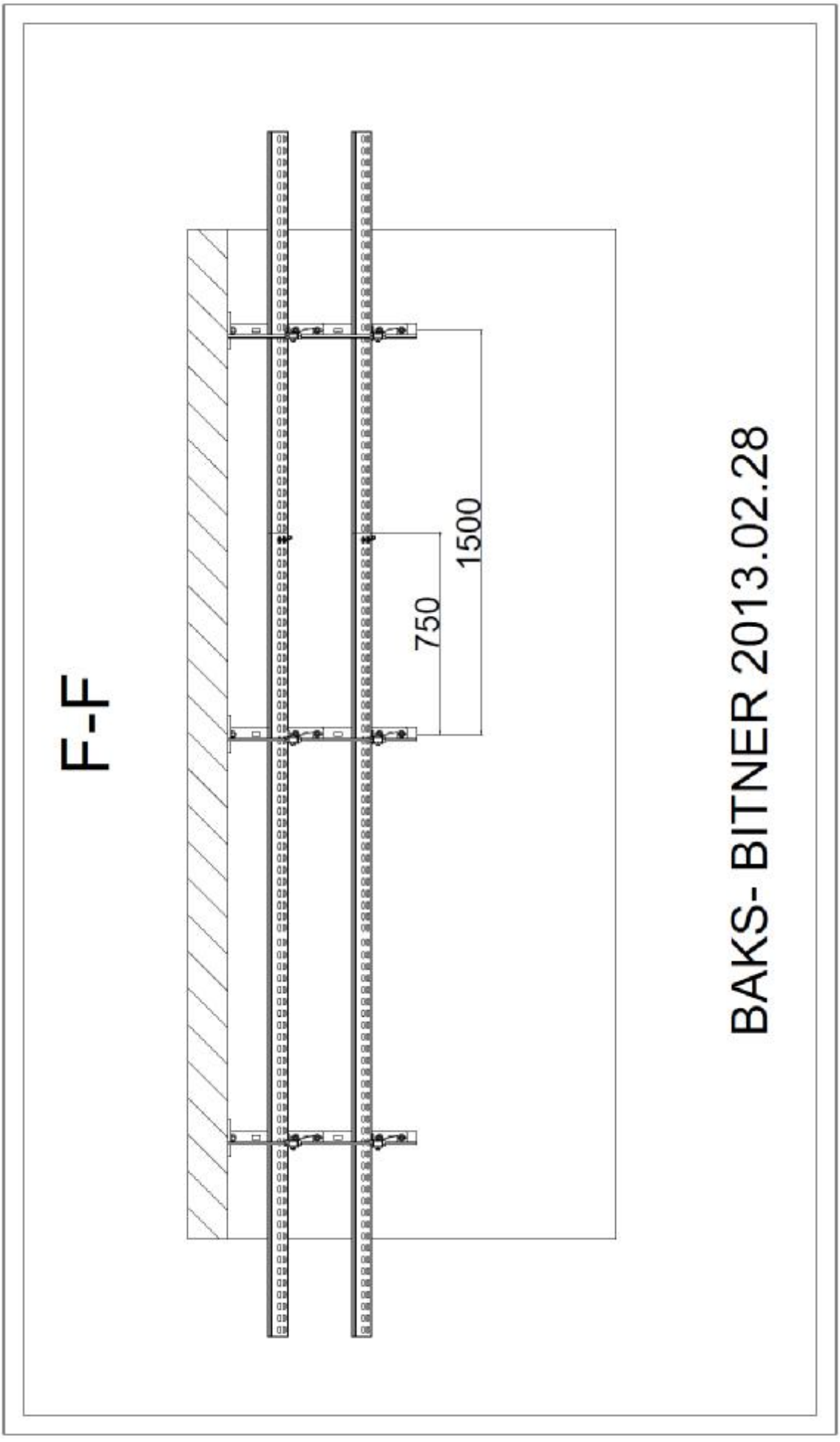

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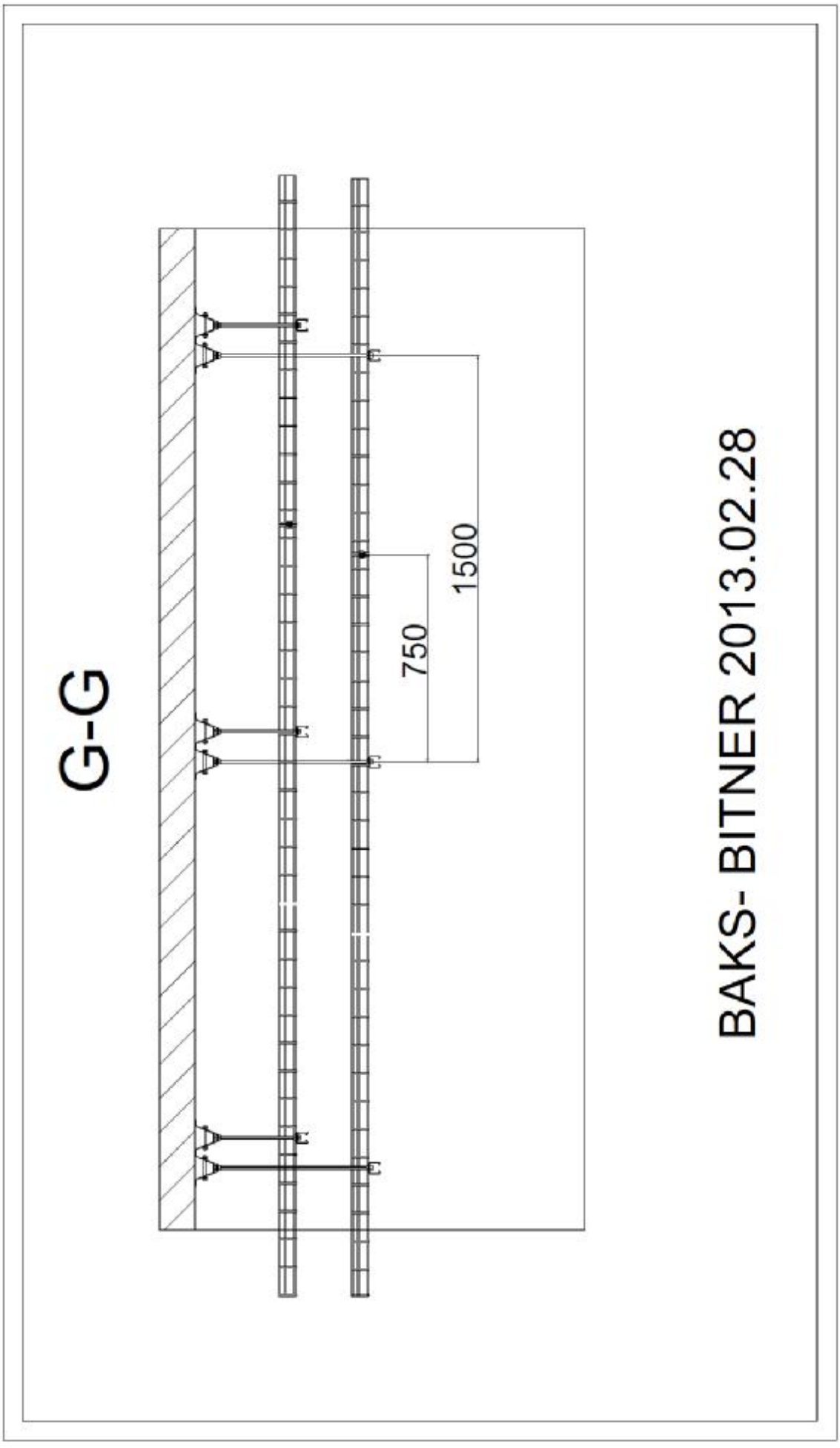

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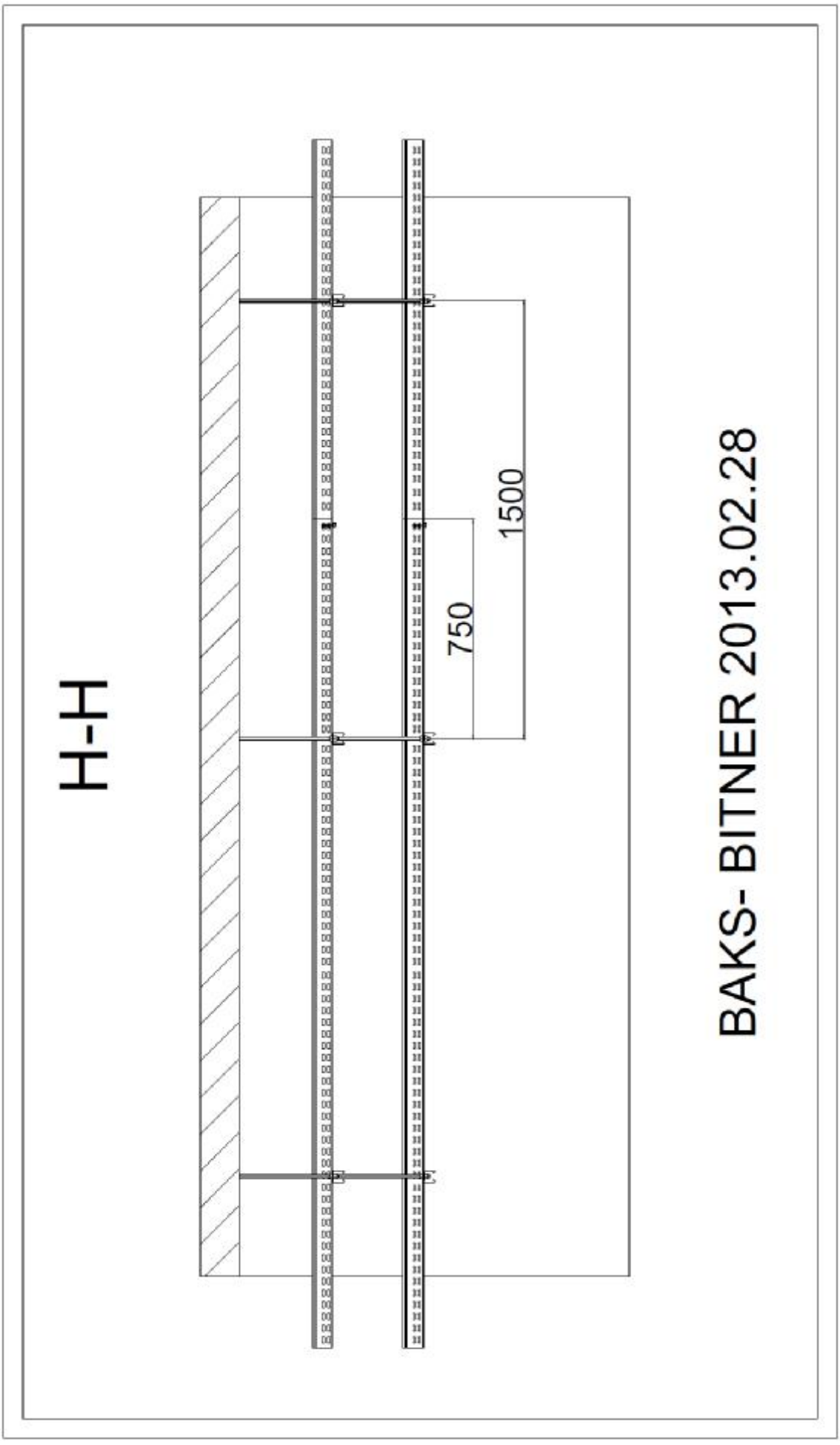

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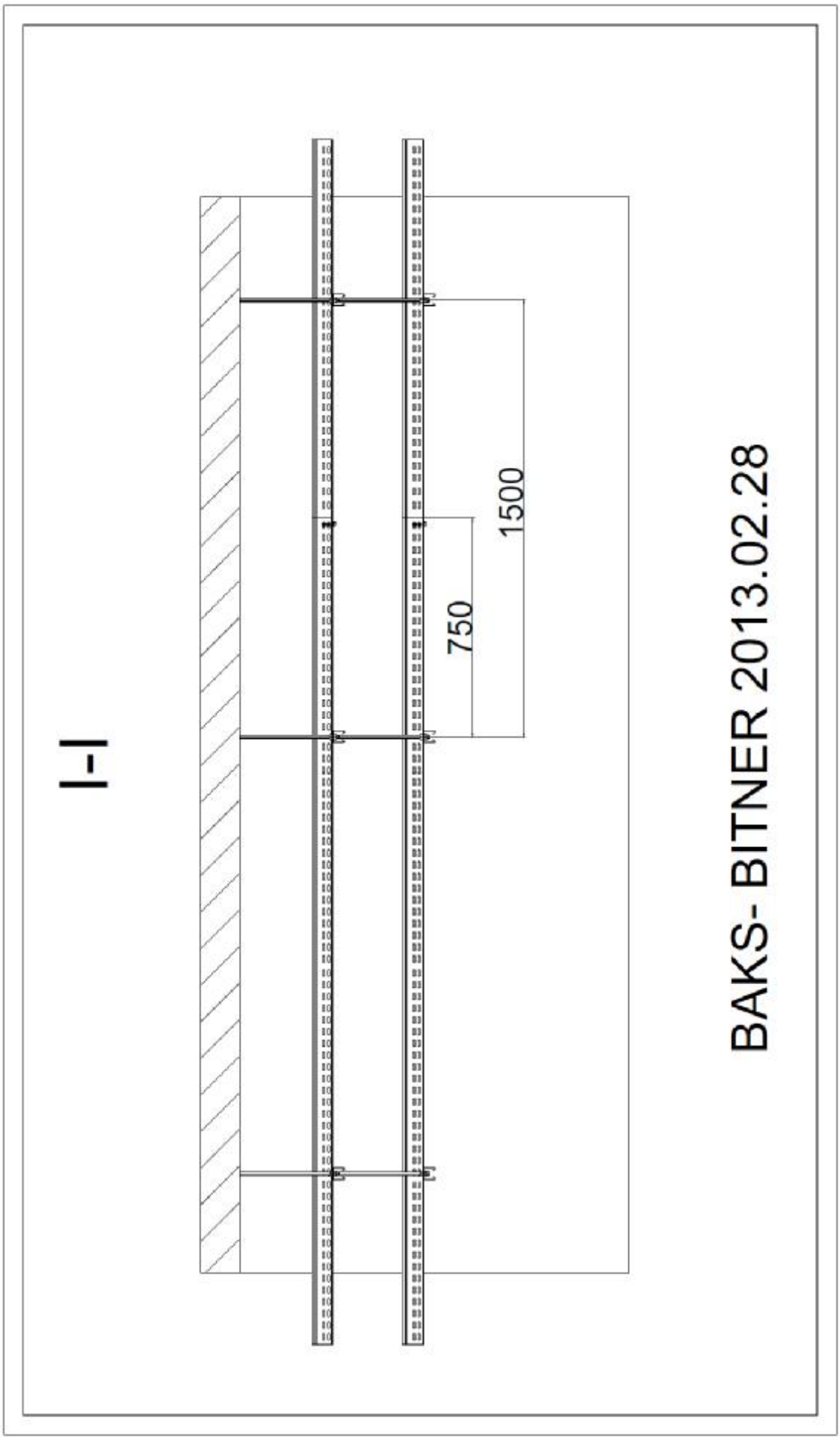

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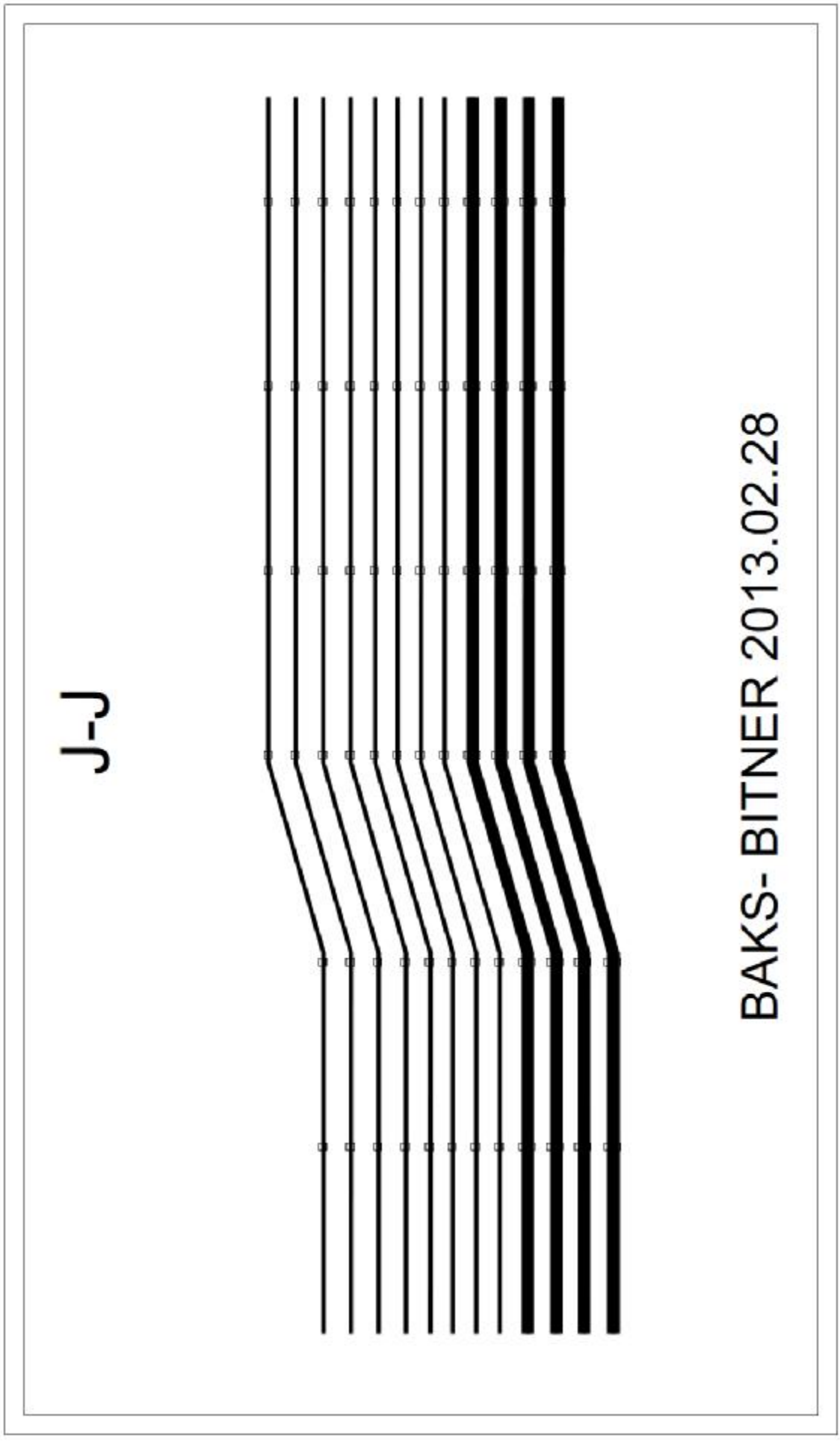

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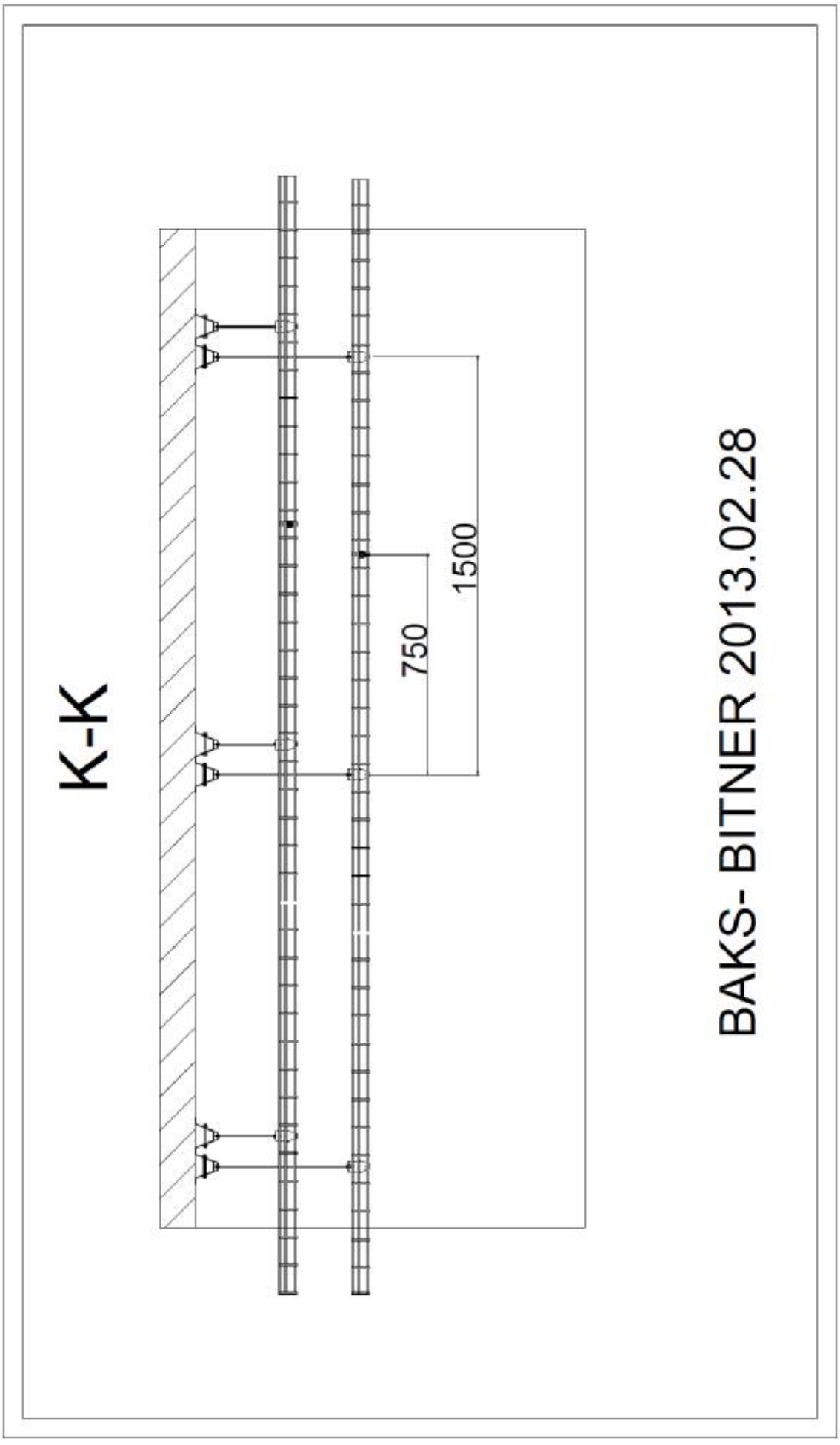

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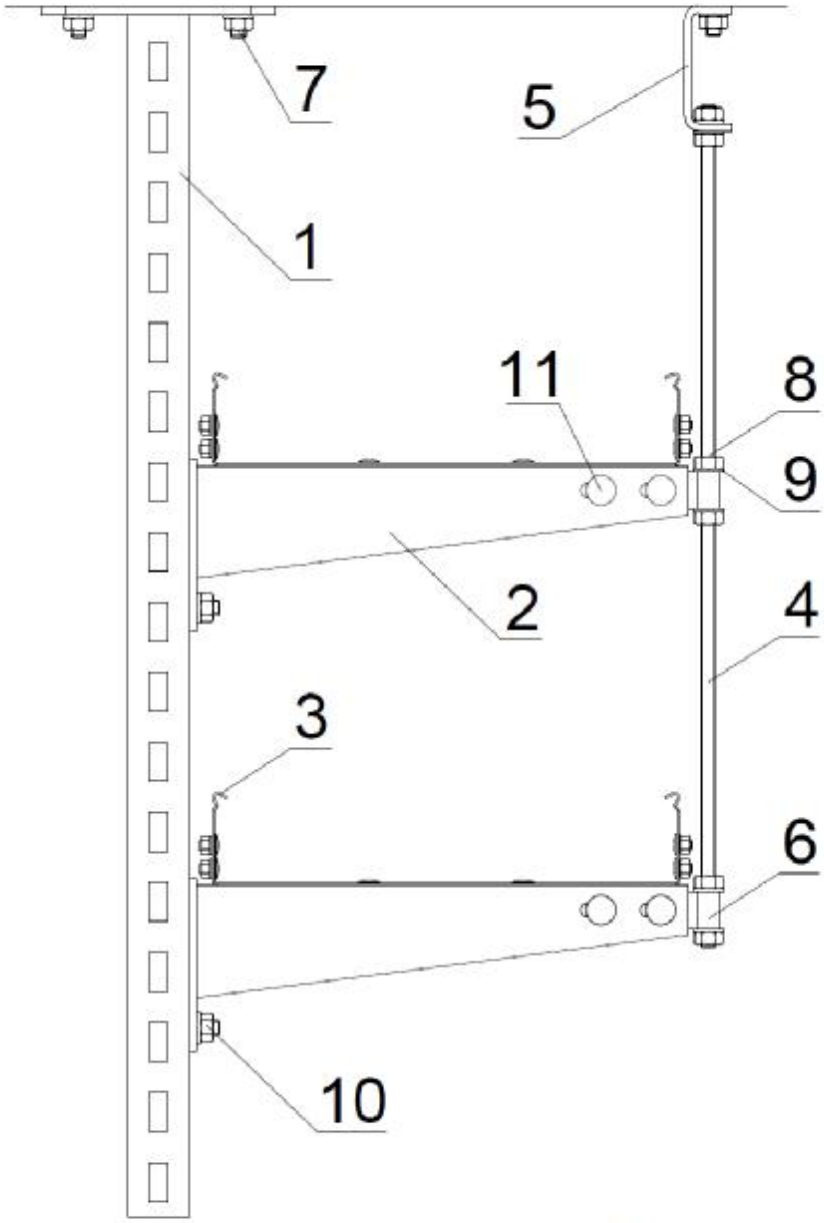
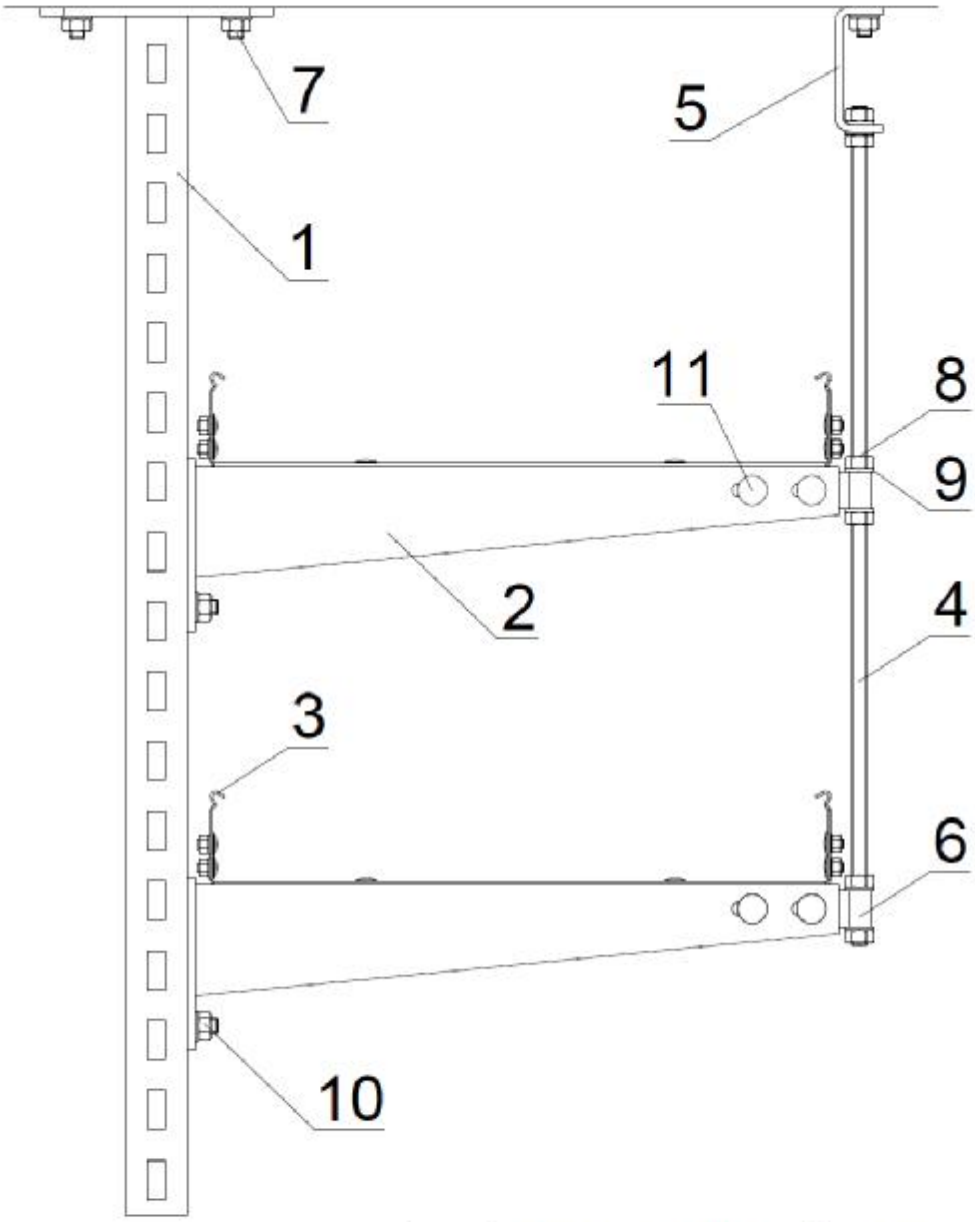


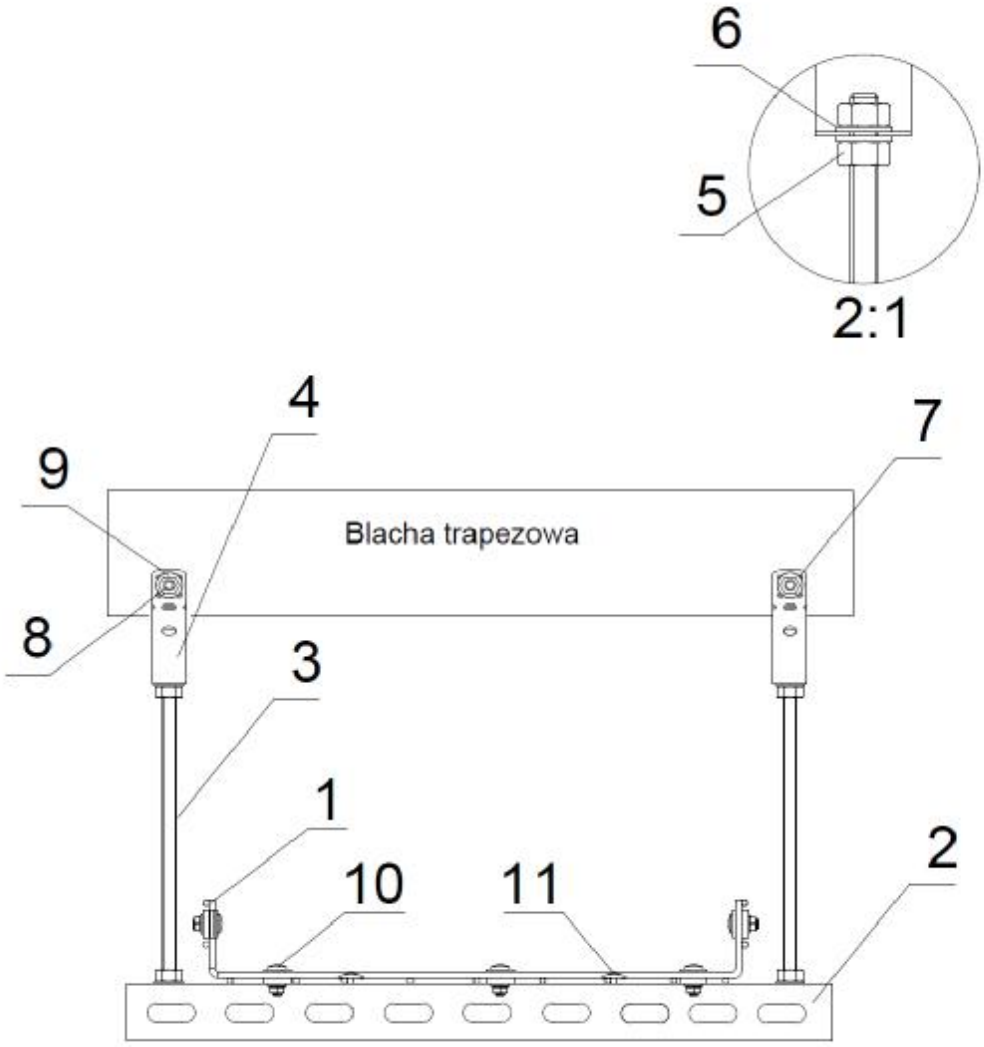
L.p.	Nazwa	Symbol	Szt.
12	Śruba z łbem grzybkowym	SGKM6x12	12
11	Śruba z łbem grzybkowym	SGKM8x14	4
10	Śruba	SMM10x30	4
9	Podkładka	PP10	6
8	Nakrętka	NSM10	6
7	Śruba tulejowa rozporowa	PSROM10x80	3
6	Uchwyt	UPWO	2
5	Uchwyt sufitowy	USV/USOV	1
4	Pręt gwintowany	PGM10/...	1
3	Korytko	KGL/KGOL300H60	2
2	Wysięgnik	WMC/WMCO300	2
1	Wspornik sufitowy	WPCW/WPCO1000	1

DRAWINGS



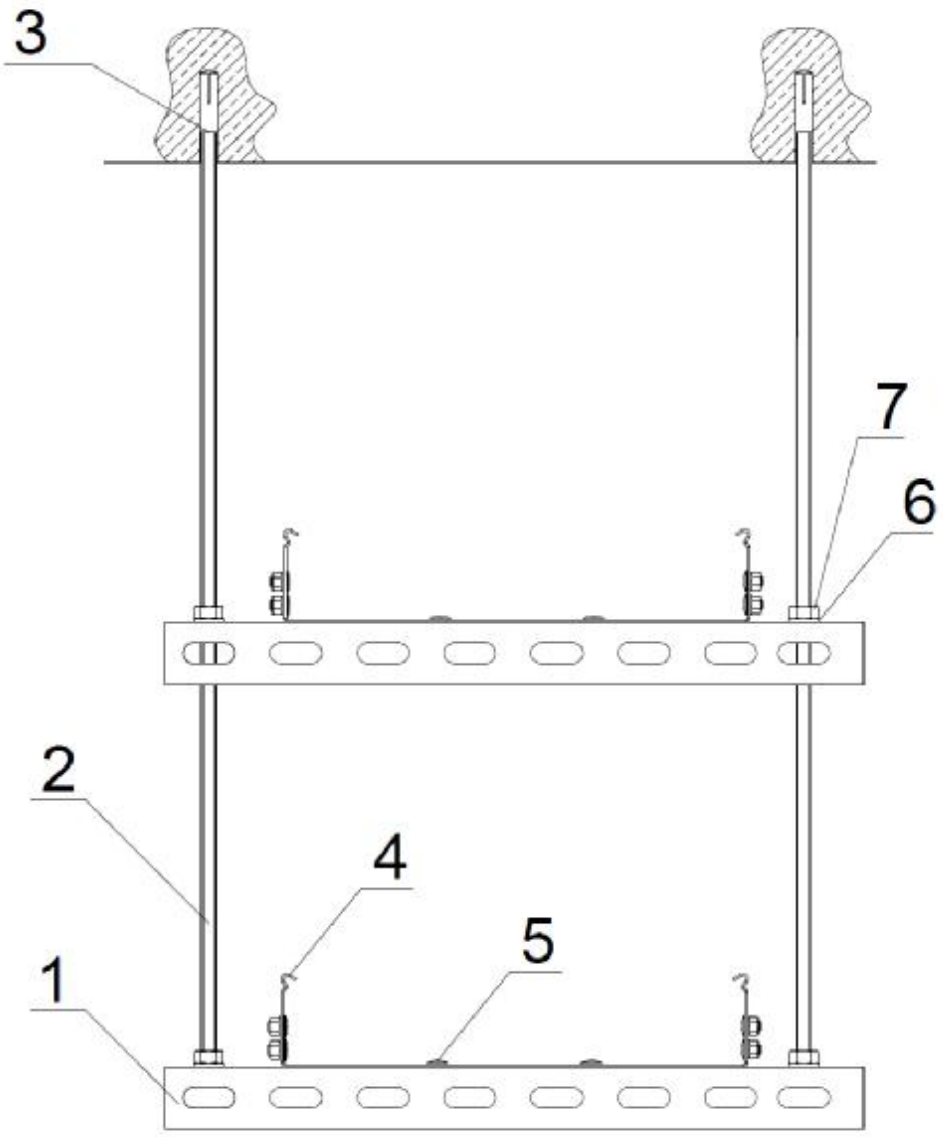
L.p.	Nazwa	Symbol	Szt.
12	Śruba z łbem grzybkowym	SGKM6x12	12
11	Śruba z łbem grzybkowym	SGKM8x14	4
10	Śruba	SMM10x30	4
9	Podkładka	PP10	6
8	Nakrętka	NSM10	6
7	Śruba tulejowa rozporowa	PSROM10x80	3
6	Uchwyt	UPWO	2
5	Uchwyt sufitowy	USV/USOV	1
4	Pręt gwintowany	PGM10/...	1
3	Korytko	KGJ/KGOJ400H60	2
2	Wysięgnik	WMC/WMCO400	2
1	Wspornik sufitowy	WPCW/WPCO1000	1

DRAWINGS



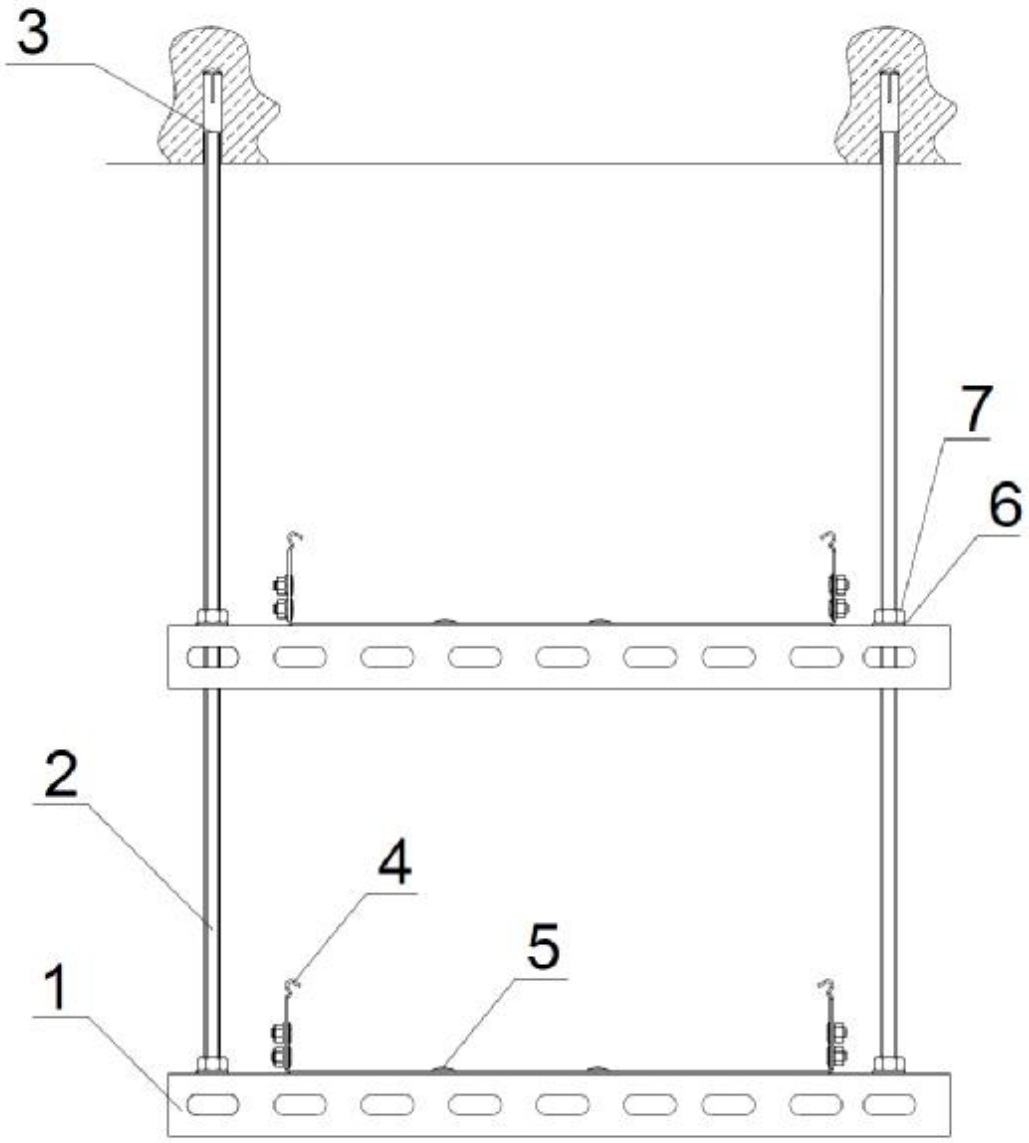
L.p.	Nazwa	Symbol	Szt.
11	Zacisk śrubowy	ZS/ZSO	2
10	Uchwyt śrubowy	USS/USS	5
9	Podkładka	PP8	4
8	Nakrętka	NSM8	4
7	Pręt gwintowany	PGM8/....	2
6	Podkładka	PP10	8
5	Nakrętka	NSM10	8
4	Wieszak trapezowy	WT/WTO120Ø11	2
3	Pręt gwintowany	PGM10/....	2
2	Ceownik wzmocniony	CWP/CWOP40H40/05	1
1	Korytko siatkowe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

DRAWINGS



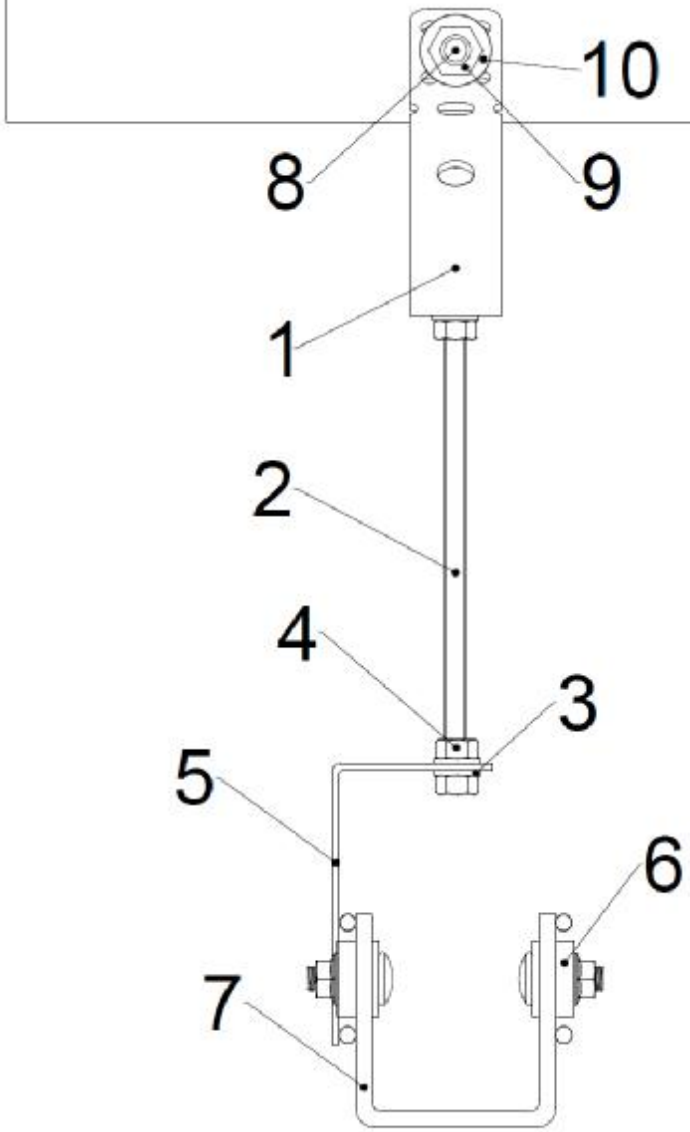
L.p.	Nazwa	Symbol	Szt.
7	Podkładka	PP10	8
6	Nakrętka	NSM10	8
5	Śruba z łbem grzybkowym	SGKM6x12	12
4	Korytko	KGL/KGOL300H60	2
3	Tuleja rozporowa stalowa	TRSOM10	2
2	Pręt gwintowany	PGM10/...	2
1	Ceownik wzmocniony	CWP/CWOP40H40/04	2

DRAWINGS



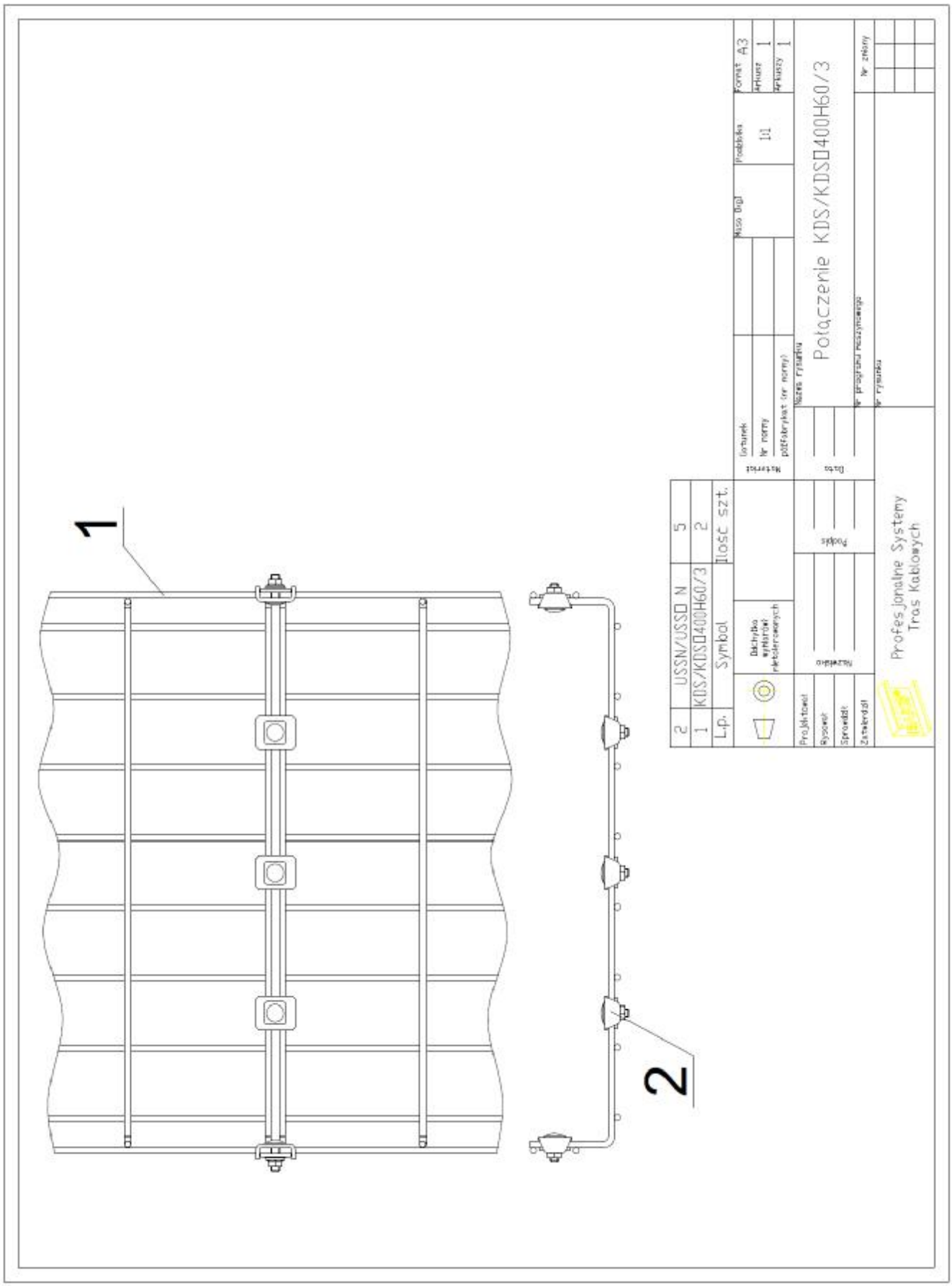
L.p.	Nazwa	Symbol	Szt.
7	Podkładka	PP10	8
6	Nakrętka	NSM10	8
5	Śruba z łbem grzybkowym	SGKM6x12	12
4	Korytko	KGJ/KGOJ400H60	2
3	Tuleja rozporowa stalowa	TRSOM10	2
2	Pręt gwintowany	PGM10/...	2
1	Ceownik wzmocniony	CWP/CWOP40H40/05	2

DRAWINGS



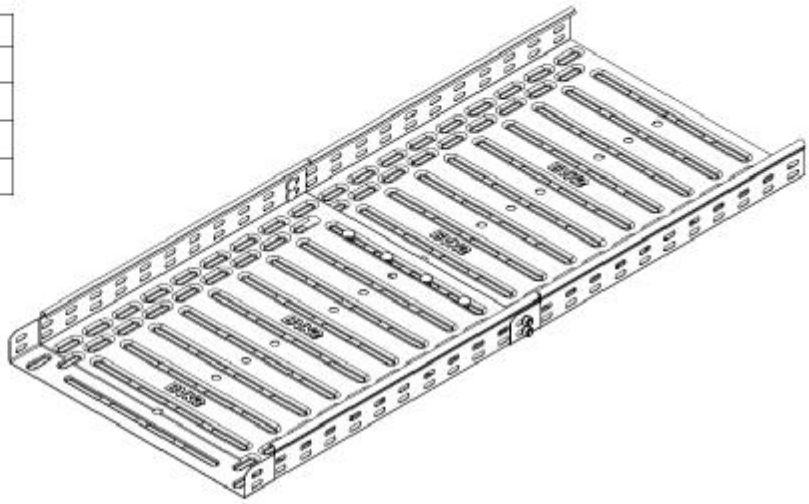
L.p.	Nazwa	Symbol	Szt.
10	Podkładka	PP6	2
9	Nakrętka	NSM6	2
8	Pręt gwintowany	PGM6/...	1
7	Korytko siatkowe	KDS/KDSO60H60/3	1
6	Uchwyt śrubowy	USSN/USSO	2
5	Wieszak	WKS/WKSO60	1
4	Nakrętka	NSM6	2
3	Podkładka	PP6	2
2	Pręt gwintowany	PGM6/...	1
1	Tuleja rozporowa stalowa	TRSOM6	1

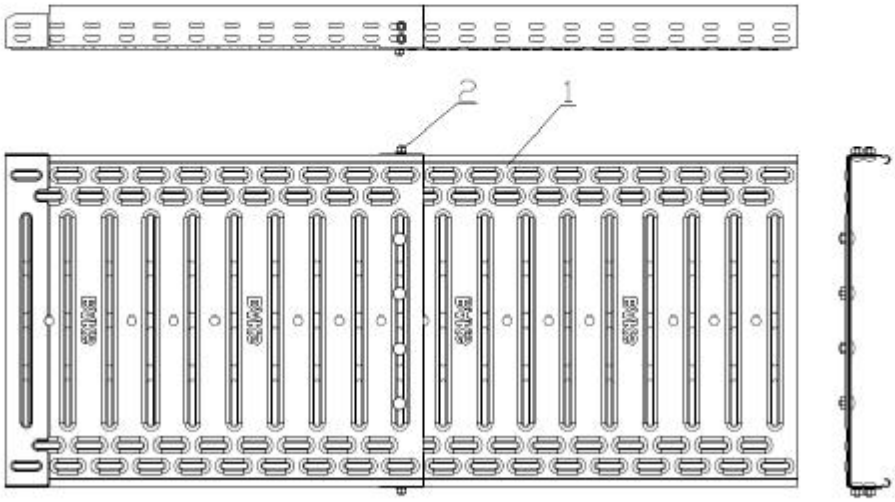
DRAWINGS


1
2
2 USSN/USSO N 5
1 KDS/KDS400H60/3 2
L.p. Symbol Ilość szt.
Połączenie KDS/KDS400H60/3
Profesjonalne Systemy Tras Kablowych

DRAWINGS

Poz.1		Poz.2
A	Typ	Ilość
100	KGL/KGDL100H60/3	6
200	KGL/KGDL200H60/3	7
300	KGL/KGDL300H60/3	8





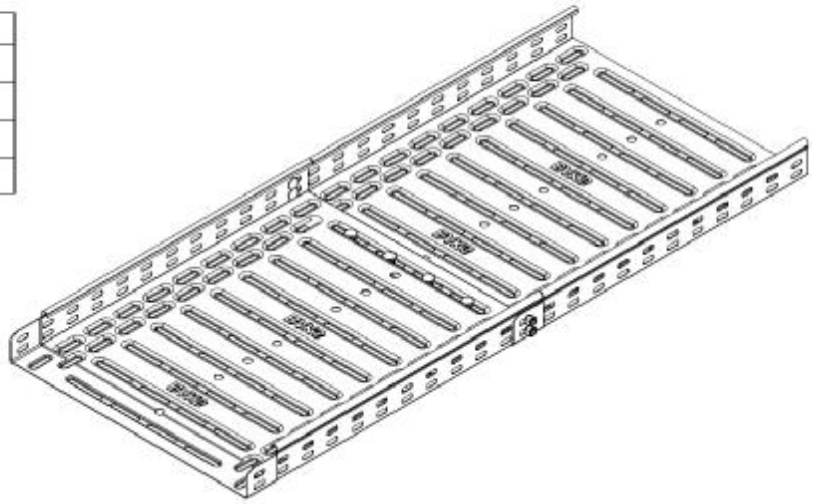
Lp.	Nazwa	Symbol	Materiał	Szt.	Nr katalogowy
2	Śruba z łbem grzybkowym	SGN M6x12		8	
1	Korytko	KGL/KGDL300H60/3		2	

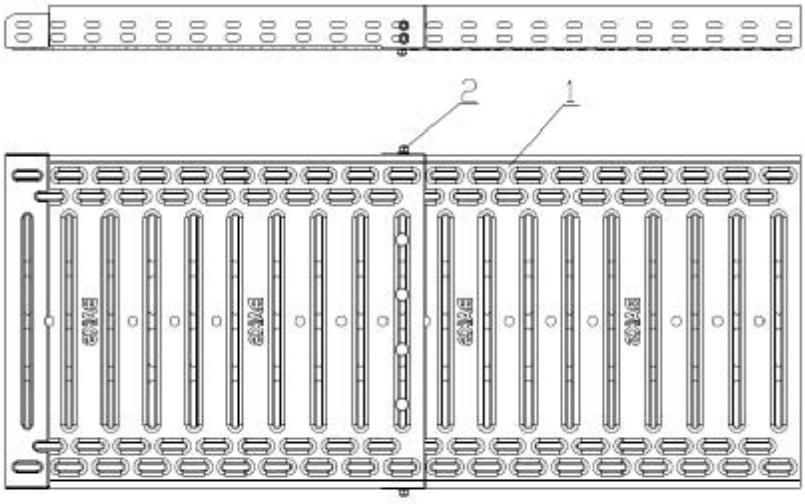
Połączenie KGL/KGDL300H60/3

Profesjonalne Systemy Tras Kablowych

DRAWINGS

Poz.1		Poz.2
A	Typ	Ilość
100	KGL/KGDL100H60/3	6
200	KGL/KGDL200H60/3	7
300	KGL/KGDL300H60/3	8



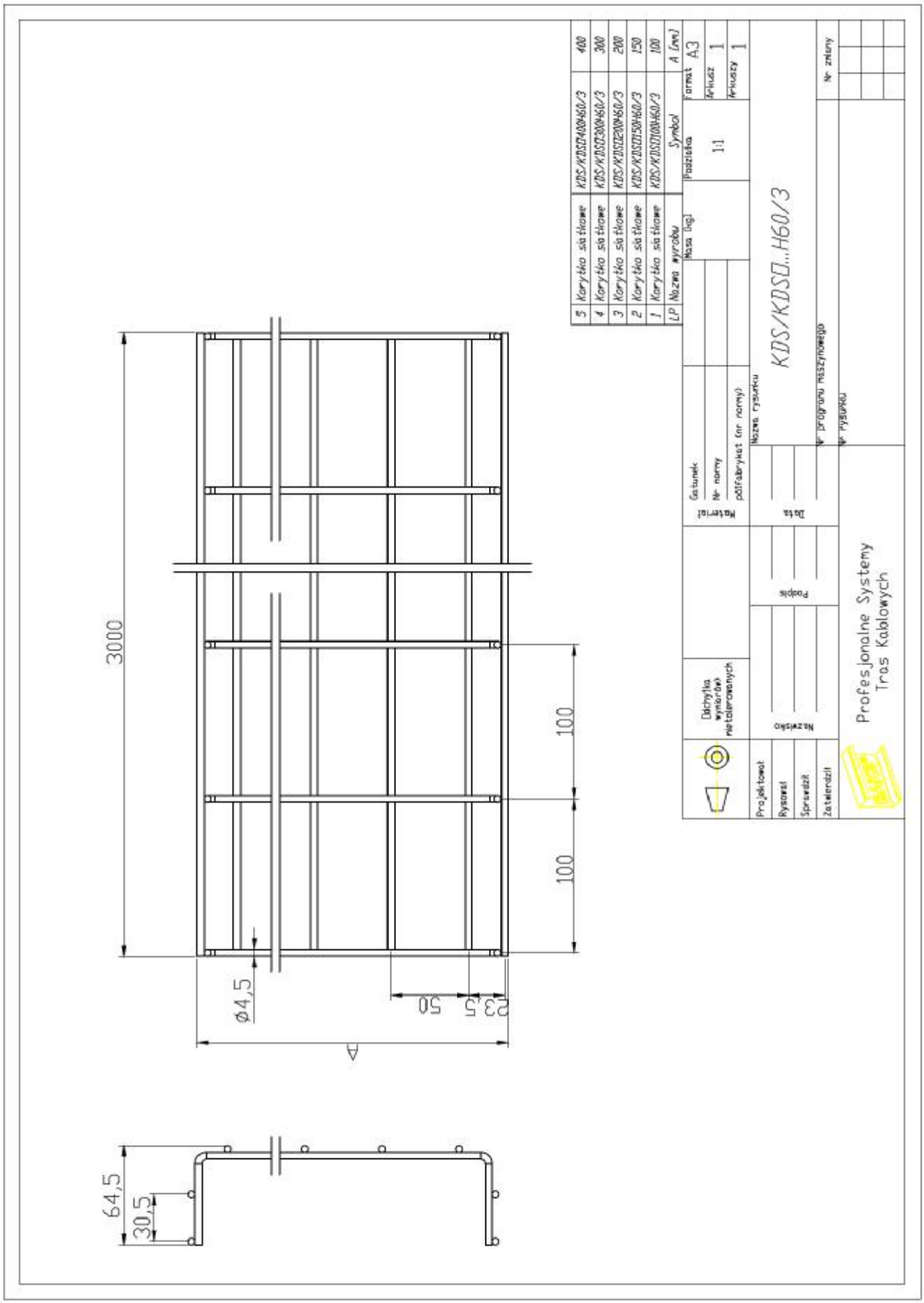


2	Śruba z łbem grzybkowym	SGN M6x12		8	
1	Korytko	KGL/KGDL300H60/3		2	
L.p.	Nazwa	Symbol	Materiał	Szt.	Nr katalogowy

Połączenie KGL/KGDL300H60/3

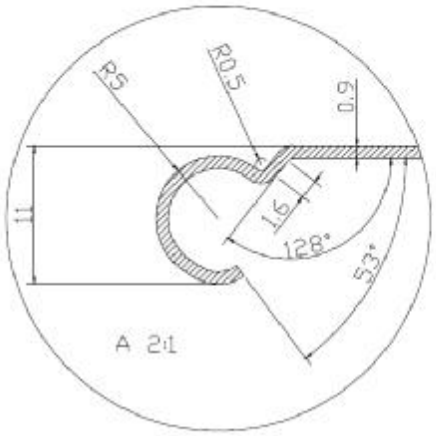
Profesjonalne Systemy Tras Kablowych

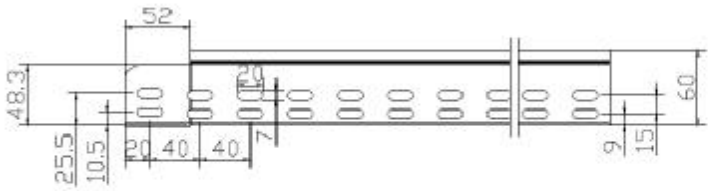
DRAWINGS

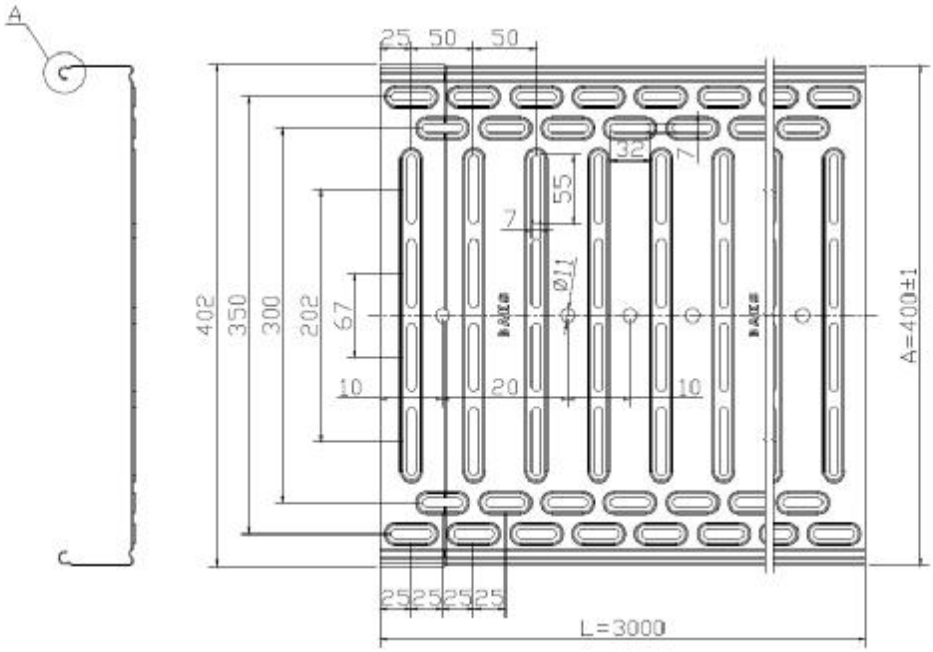

KDS/KDSD...H60/3
Profesjonalne Systemy Tras Kablowych
3000
100
100
Ø4,5
50
25
23
64,5
30,5

DRAWINGS

Typ	Szerokość A(mm)	Długość L(mm)
KGJ/KGOJ100H60/3	100	3000
KGJ/KGOJ200H60/3	200	3000
KGJ/KGOJ300H60/3	300	3000
KGJ/KGOJ400H60/3	400	3000



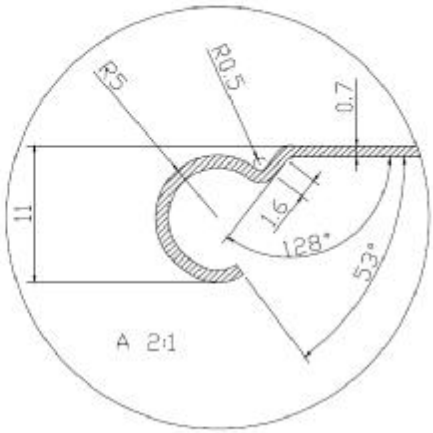


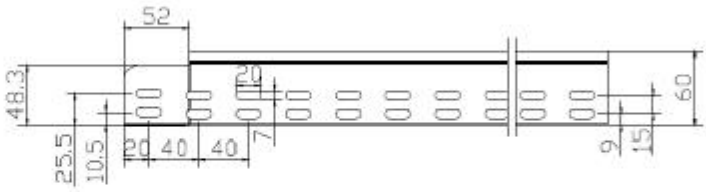


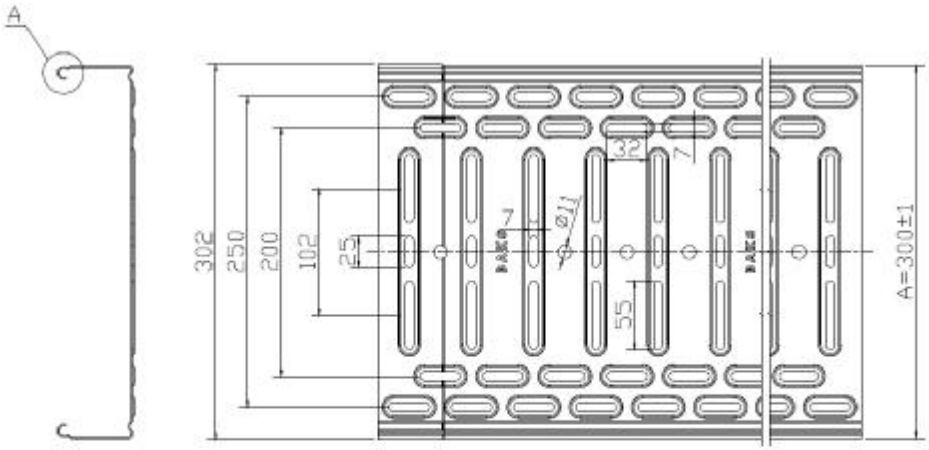
	Dachylka wykończeń metalowych		Materiał	Gatunek		Masa [kg]	Podziałka 1:5	Format A4
				Nr normy				Arkusz
				półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku KGJ/KGOJ..H60/3				
Rysował								
Sprawdził								
Zatwierdził				Nr programu maszynowego			Nr zmiany	
Profesjonalne Systemy Tras Kablowych				Nr rysunku				

DRAWINGS

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

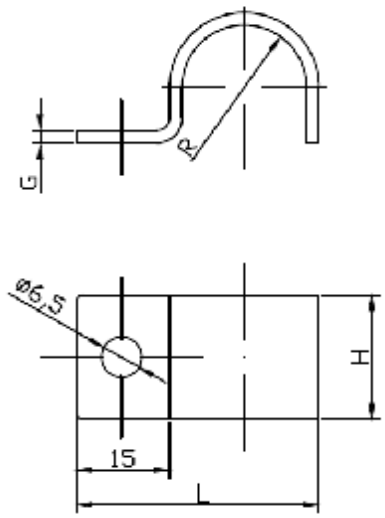






	Dachówka symetrycznie nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka 1:5	Format A4
				Nr normy				Arkusz
				półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku KGL/KGDL...H60/3				
Rysował								
Sprawdził								
Zatwierdził				Nr programu maszynowego				Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku				

DRAWINGS



LP	Nazwa wyrobu	Symbol	Nr Katalogowy	R [mm]	L [mm]	H [mm]	G [mm]
20	Uchwyt kabla	UDF 43	405543	21,5	60,0	20,0	2,0
19	Uchwyt kabla	UDF 40	405540	20,0	57,0	20,0	2,0
18	Uchwyt kabla	UDF 37	405537	18,5	54,0	20,0	2,0
17	Uchwyt kabla	UDF 34	405534	17,0	51,0	20,0	2,0
16	Uchwyt kabla	UDF 31	405531	15,5	48,0	20,0	2,0
15	Uchwyt kabla	UDF 28	405528	14,0	45,0	20,0	2,0
14	Uchwyt kabla	UDF 25	405525	12,5	44,0	20,0	2,0
13	Uchwyt kabla	UDF 22	405522	11,0	41,0	14,0	2,0
12	Uchwyt kabla	UDF 20	405520	10,0	39,0	14,0	2,0
11	Uchwyt kabla	UDF 18	405518	9,0	37,0	14,0	2,0
10	Uchwyt kabla	UDF 16	405516	8,0	35,0	14,0	2,0
9	Uchwyt kabla	UDF 15	405515	7,5	34,0	14,0	2,0
8	Uchwyt kabla	UDF 14	405514	7,0	33,0	14,0	1,2
7	Uchwyt kabla	UDF 12	405512	6,0	30,0	14,0	1,2
6	Uchwyt kabla	UDF 10	405510	5,0	28,0	14,0	1,2
5	Uchwyt kabla	UDF 9	405509	4,5	27,0	14,0	1,2
4	Uchwyt kabla	UDF 8	405508	4,0	26,0	14,0	1,2
3	Uchwyt kabla	UDF 7	405507	3,5	25,0	14,0	1,2
2	Uchwyt kabla	UDF 6	405506	3,0	24,0	14,0	1,2
1	Uchwyt kabla	UDF 5	405505	2,5	23,0	14,0	1,2

Odchyłka wymiarów nieobrobionych: ±0,5

Materiał: Gatunek; Nr normy: PN-EN 10327:2005; półfabrykat (nr normy): -----

Masa [kg]: ---

Podziałka: 1:1

Format: A4; Arkusz: --; Arkuszy: --

	Nazwisko	Podpis	Data
Projektował	Jacek Grochowski		20.10.05
Rysował	Jakub Rudak		20.02.08
Sprawdził	Jacek Kilczek		20.02.08
Zatwierdził	Jacek Kilczek		20.02.08

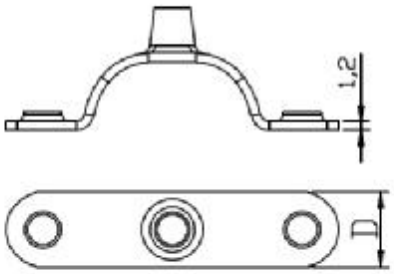
Nazwa rysunku: UDF 5-43

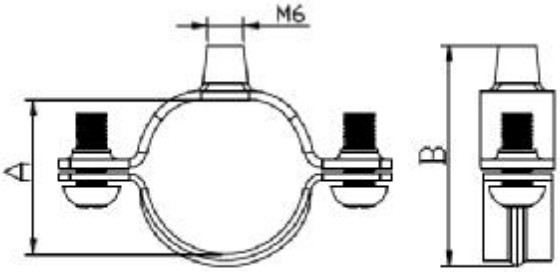
Nr zmiany:

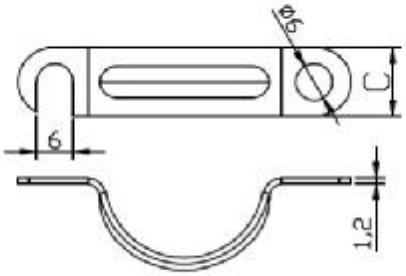
Profesjonalne Systemy Tras Kablowych

Nr rysunku: 4055.....

DRAWINGS







symbol	A	B	C	D
KSA 6	5	9	11	12
KSA 8	7	15	11	12
KSA 10	9	17	11	12
KSA 12	11	19	11	12
KSA 14	13	22	11	12
KSA 16	15	24	11	12
KSA 18	17	26	11	12
KSA 20	19	27	11	12
KSA 22	21	29	11	14
KSA 24	23	31	11	14
KSA 25	24	32	11	14
KSA 26	25	33	11	14
KSA 28	27	35	11	14
KSA 32	31	39	11	14
KSA 33	32	40	12	16
KSA 35	34	42	12	16
KSA 36	35	45	12	16
KSA 40	39	47	12	16
KSA 42	41	49	12	16
KSA 48	46	56	14	16
KSA 50	48	58	14	16
KSA 55	53	62	14	16

Odchyłka wymiarów nietolerowanych

Materiał: Gatunek; Nr normy; półfabrykat (nr normy)

Masa [kg]

Podziałka 1:1

Format A4; Arkusz 1; Arkuszy 1

Projektował	JGRODKOWSKI		
Rysował	JGRODKOWSKI		
Sprawdził	T.WŁODARCZYK		
Zatwierdził	J.KLOCEK		29.03.09

Nazwisko; Podpis; Data

Nazwa rysunku: KSA

Nr programu maszynowego: ---

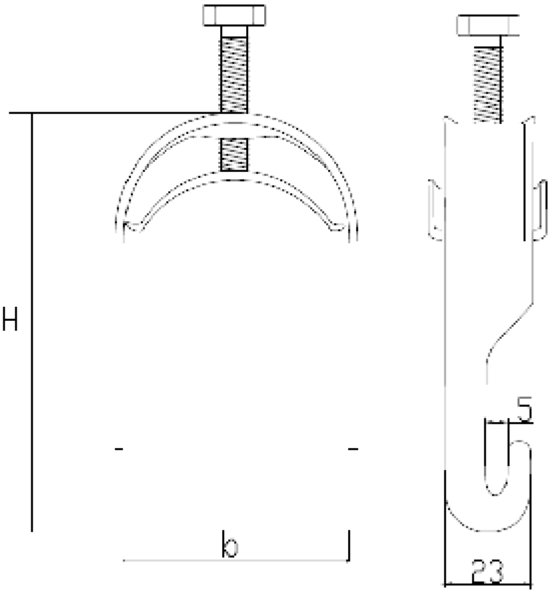
Nr zmiany

Profesjonalne Systemy Tras Kablowych

Nr rysunku: ---

DRAWINGS

Lp	Symbol	b	l	Śruba
1	UKZ/UKZT1/16-22	22mm	61,5mm	M8x40
2	UKZ/UKZ 1/22-28	28mm	68mm	M8x40
3	UKZ/UKZ 1/28-34	34mm	76mm	M8x40
4	UKZ/UKZ 1/34-40	40mm	84,5mm	M8x40
5	UKZ/UKZ 1/40-46	46mm	91,5mm	M8x50
6	UKZ/UKZT1/46-52	52mm	102mm	M8x50
7	UKZ/UKZ 1/58-64	64mm	111mm	M8x50

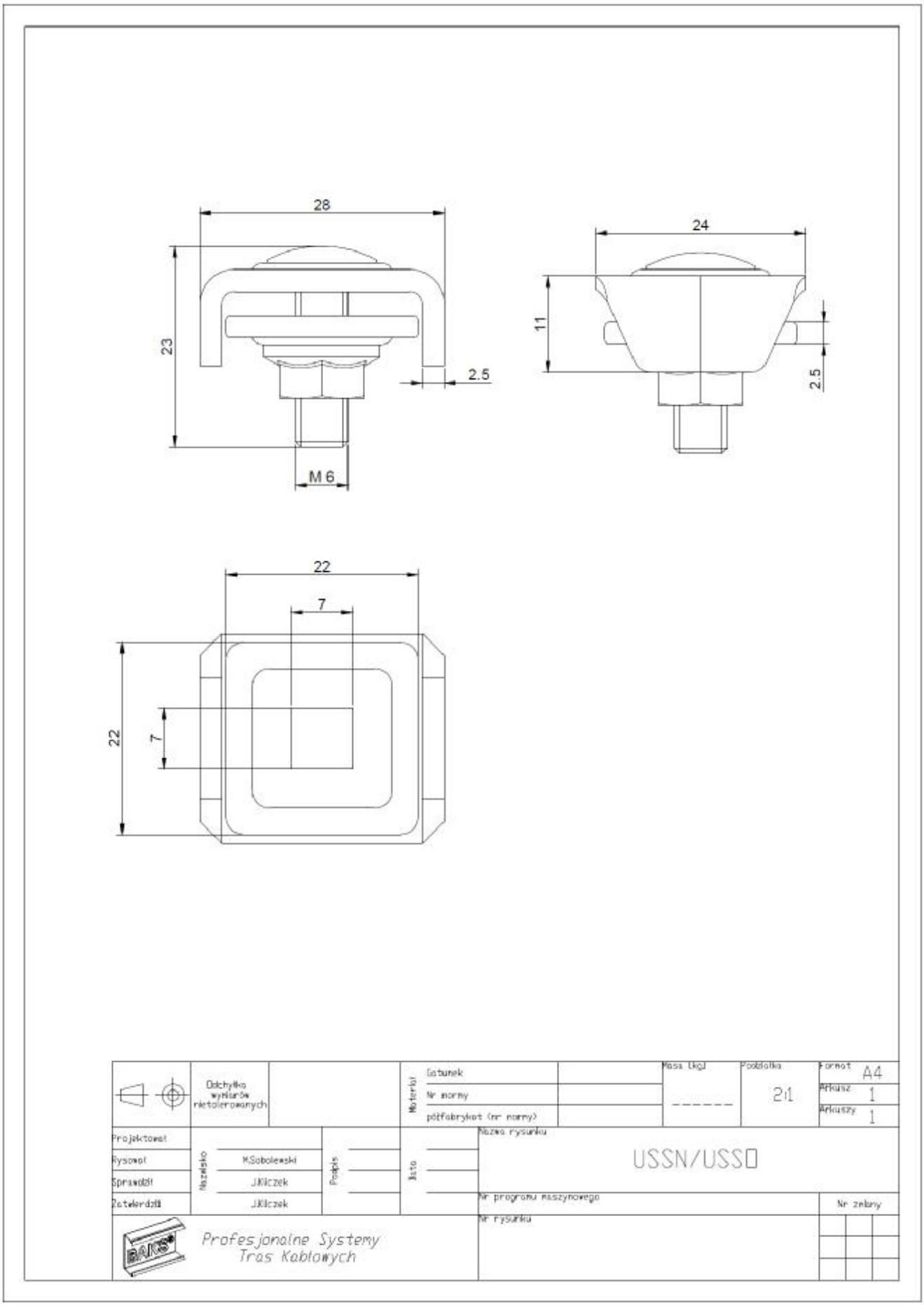


Projektował
Rysował
Sprawdził
Zatwierdził

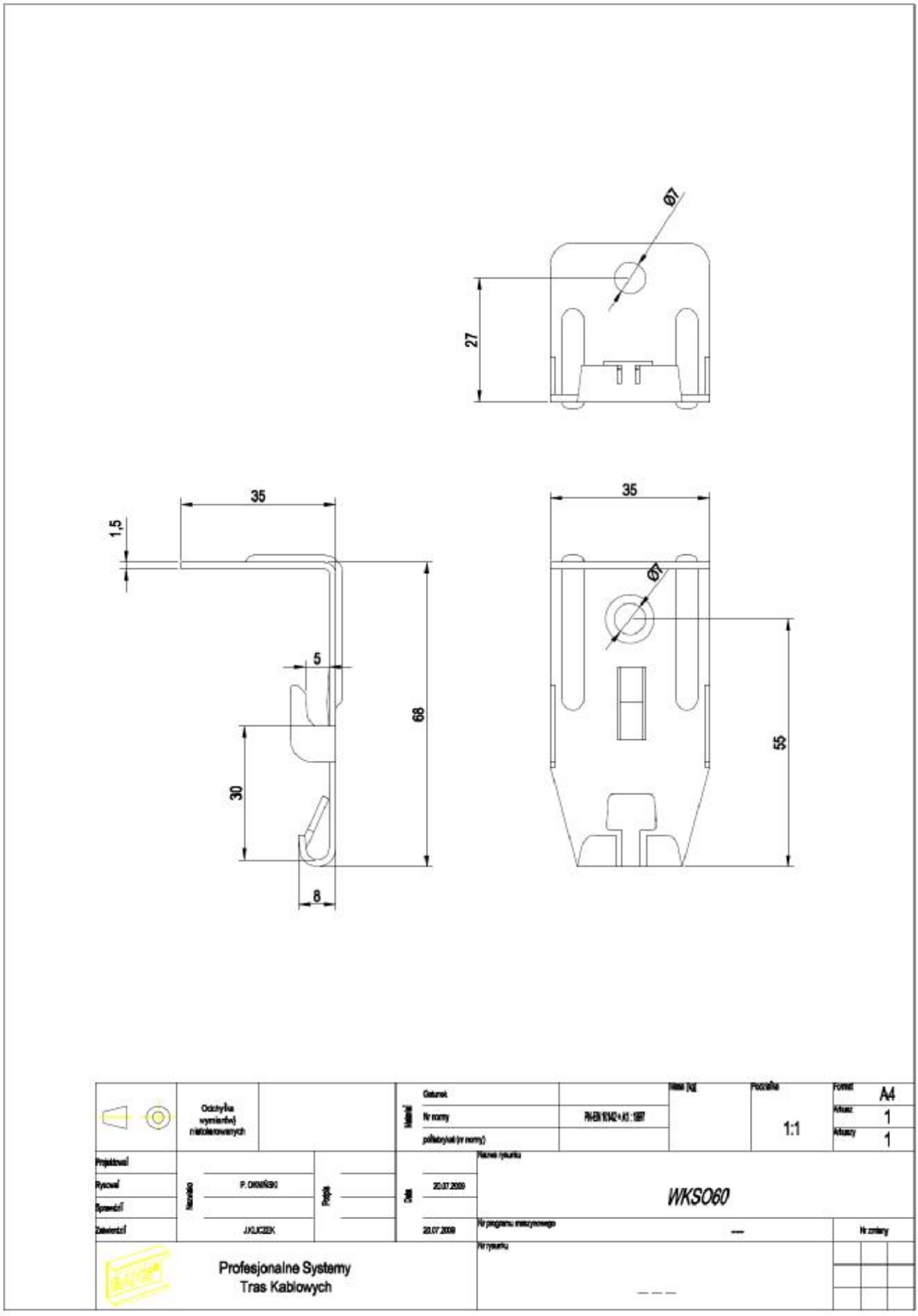
UKZ/UKZT1

Profesjonalne Systemy Tras Kablowych

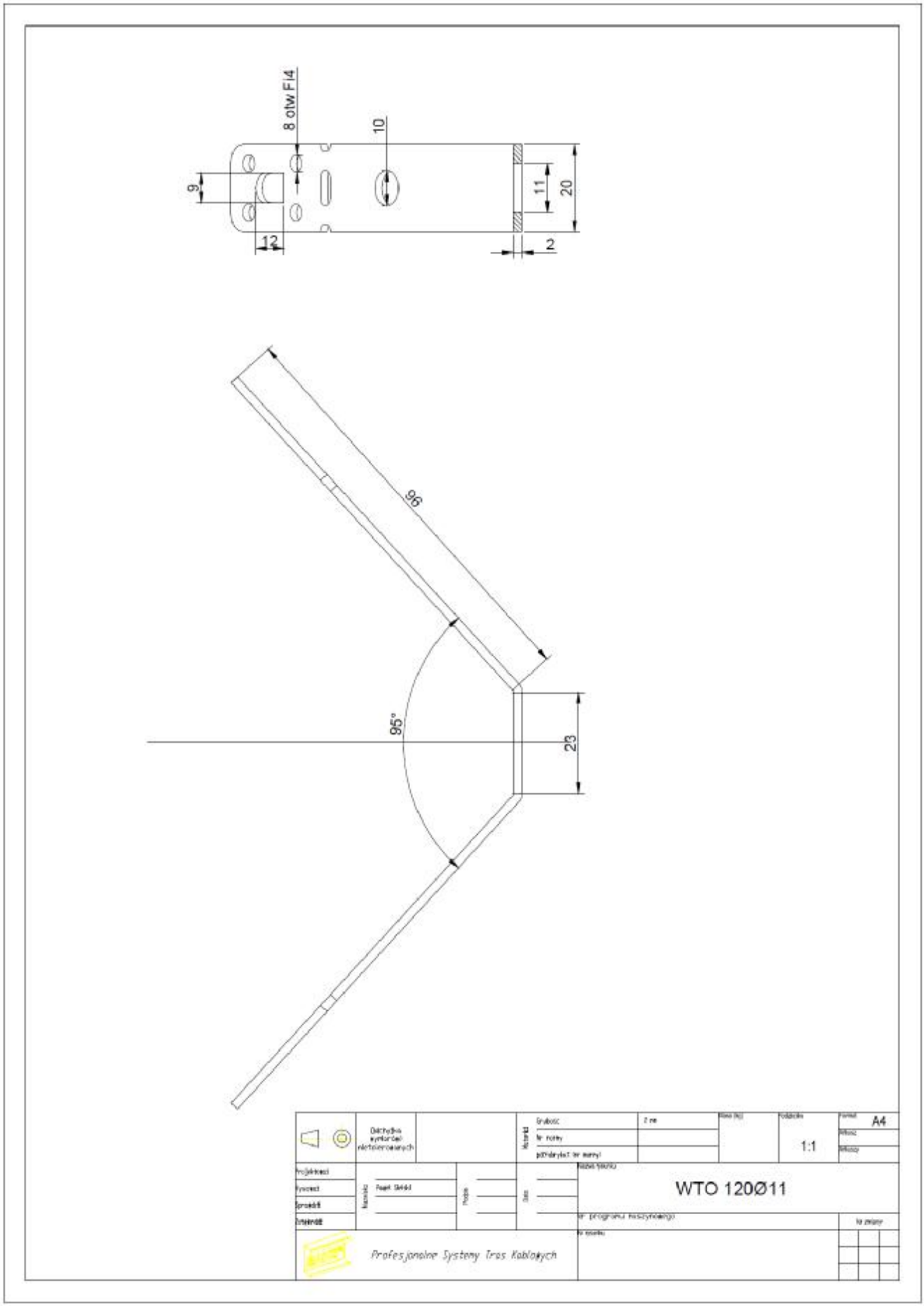
DRAWINGS


28
23
2.5
M 6
24
11
2.5
22
7
22
7
Odchyłka wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa [kg]
Podziałka
2:1
Format A4
Arkusz 1
Arkuszy 1
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
M.Sobolewski
J.Kliczek
J.Kliczek
Podpis
Data
Nazwa rysunku
USSN/USS
Nr programu maszynowego
Nr znaku
Nr rysunku
Profesjonalne Systemy Tras Kablowych

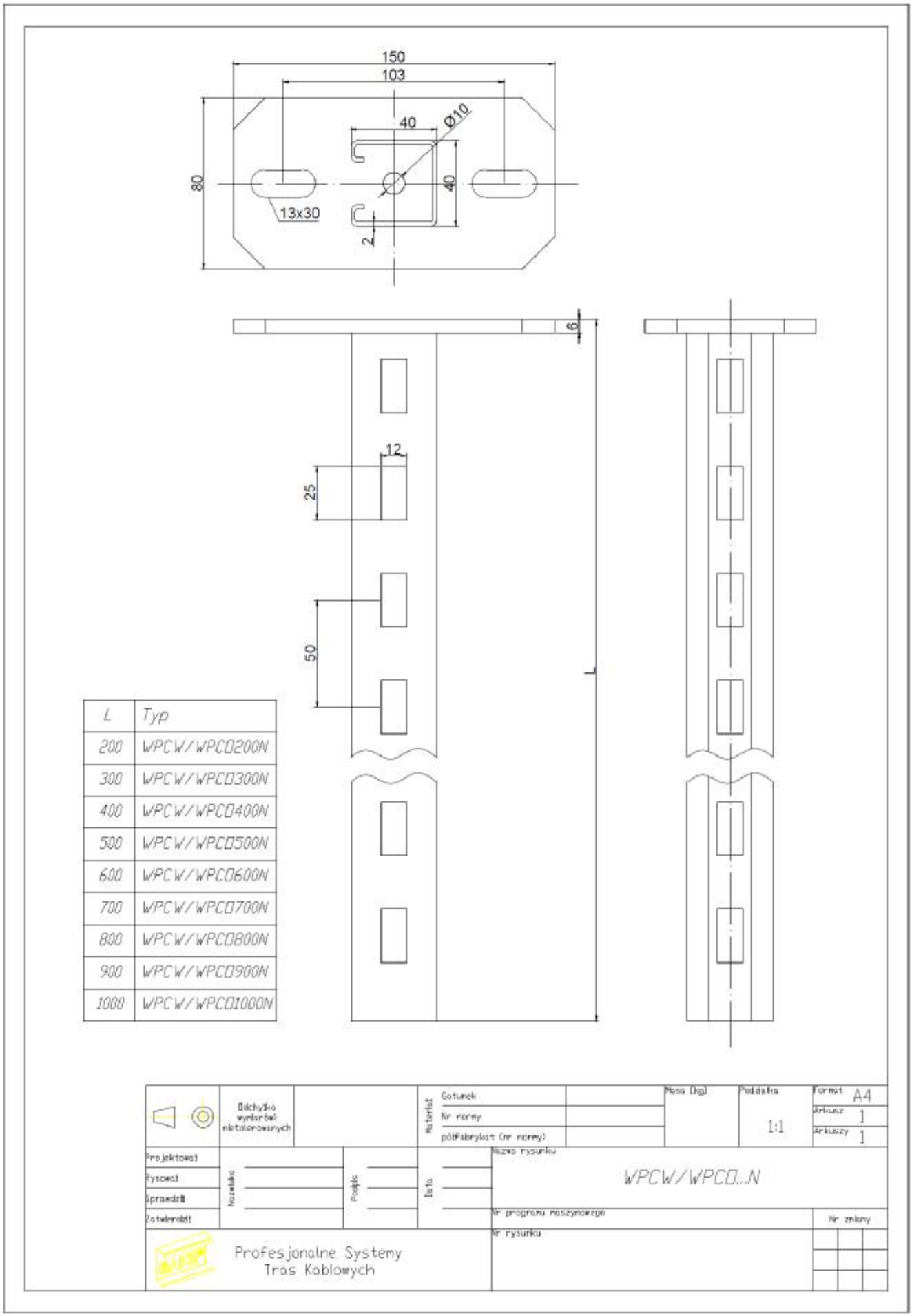
DRAWINGS


Ø7
27
35
1,5
5
68
30
8
35
Ø7
55
Odchyłka wymiarów nieobrobionych
Materiał
Gatunek
Nr normy
PN-EN 10142 + A1: 1997
półfabrykat (nr normy)
Masa [kg]
Przeliczenie
1:1
Format
A4
Arkusz
1
Arkuszy
1
Przygotował
Rysował
Sprawdził
Zatwierdził
Nazwisko
P. DRWIĘGO
J.KLICZEK
Podpis
Data
20.07.2009
20.07.2009
Nazwa rysunku
WKSO60
Nr programu maszynowego
—
Nr zmiany
Nr rysunku
Profesjonalne Systemy Tras Kablowych

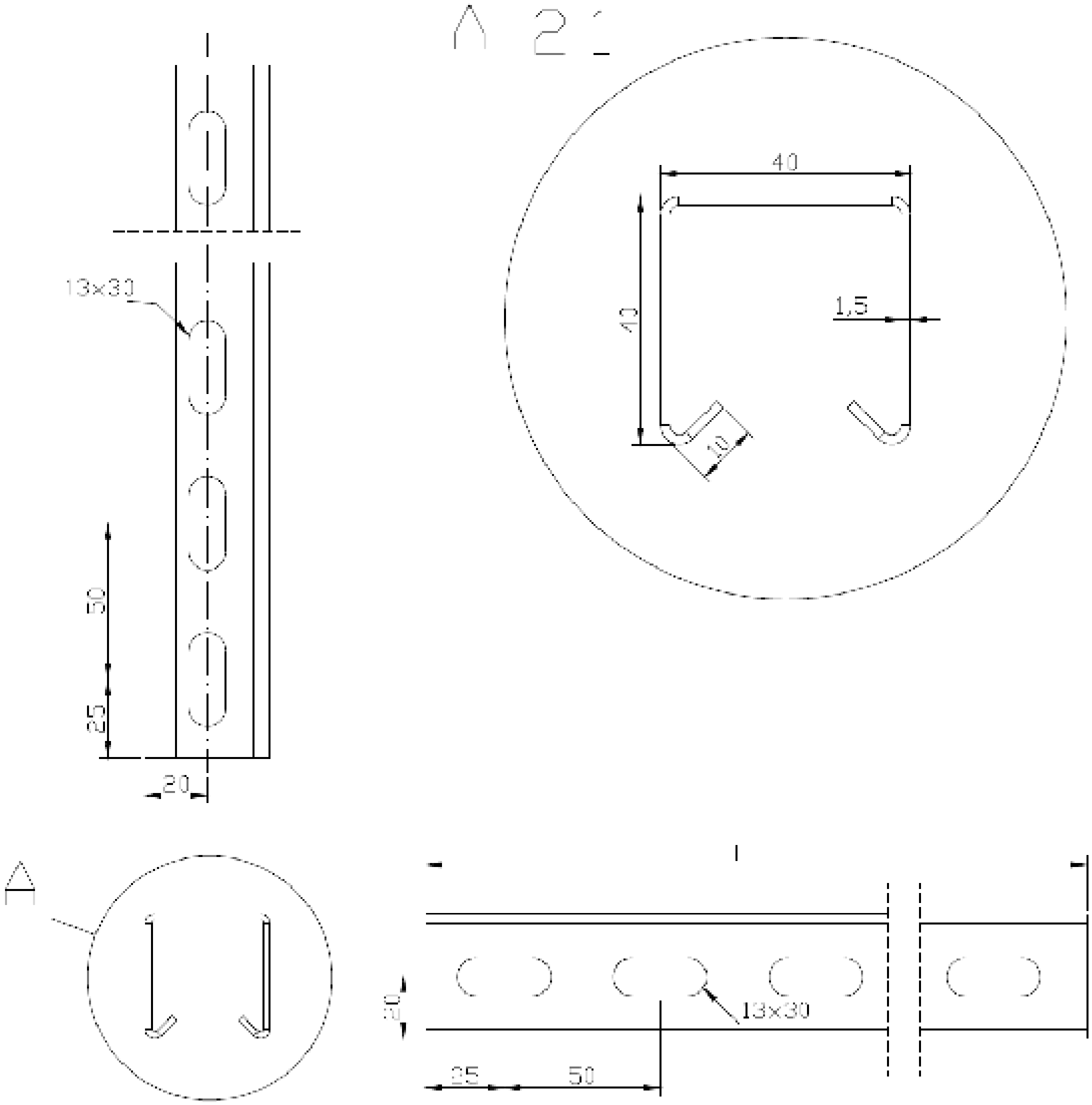
DRAWINGS


8 otw Fi4
10
9
11
20
12
2
96
95°
23
WTO 120Ø11
Profesjonalne Systemy Tras Kablowych

DRAWINGS



L	Typ
200	WPCW/WPC□200N
300	WPCW/WPC□300N
400	WPCW/WPC□400N
500	WPCW/WPC□500N
600	WPCW/WPC□600N
700	WPCW/WPC□700N
800	WPCW/WPC□800N
900	WPCW/WPC□900N
1000	WPCW/WPC□1000N



LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	Masa [kg]
7	Ceownik wzmocniony	CWP/CWDP40H40/ 2		2000	3,50
6	Ceownik wzmocniony	CWP/CWDP40H40/07		700	1,23
5	Ceownik wzmocniony	CWP/CWDP40H40/06		600	1,05
4	Ceownik wzmocniony	CWP/CWDP40H40/05		500	0,88
3	Ceownik wzmocniony	CWP/CWDP40H40/04		400	0,70
2	Ceownik wzmocniony	CWP/CWDP40H40/03		300	0,53
1	Ceownik wzmocniony	CWP/CWDP40H40/02		200	0,35

Odchyłki wymiarów niektórych
Grubość [mm] 1,5
Materiał: Gatunek: Blacha stal. cynk. met. Sendzimira; Nr normy: PN-EN 10327/2005; Współczynnik (nr normy): -----
Masa [kg]: ---
Podziałka: 1:1
Format: A4
Arkusz: --
Arkuszy:

Projektował	Jacek Grochowski	
Rysował	Jakub Rudzik	
Sprawdził	Jacek Kliczek	
Zatwierdził	Jacek Kliczek	

Podpis / Data

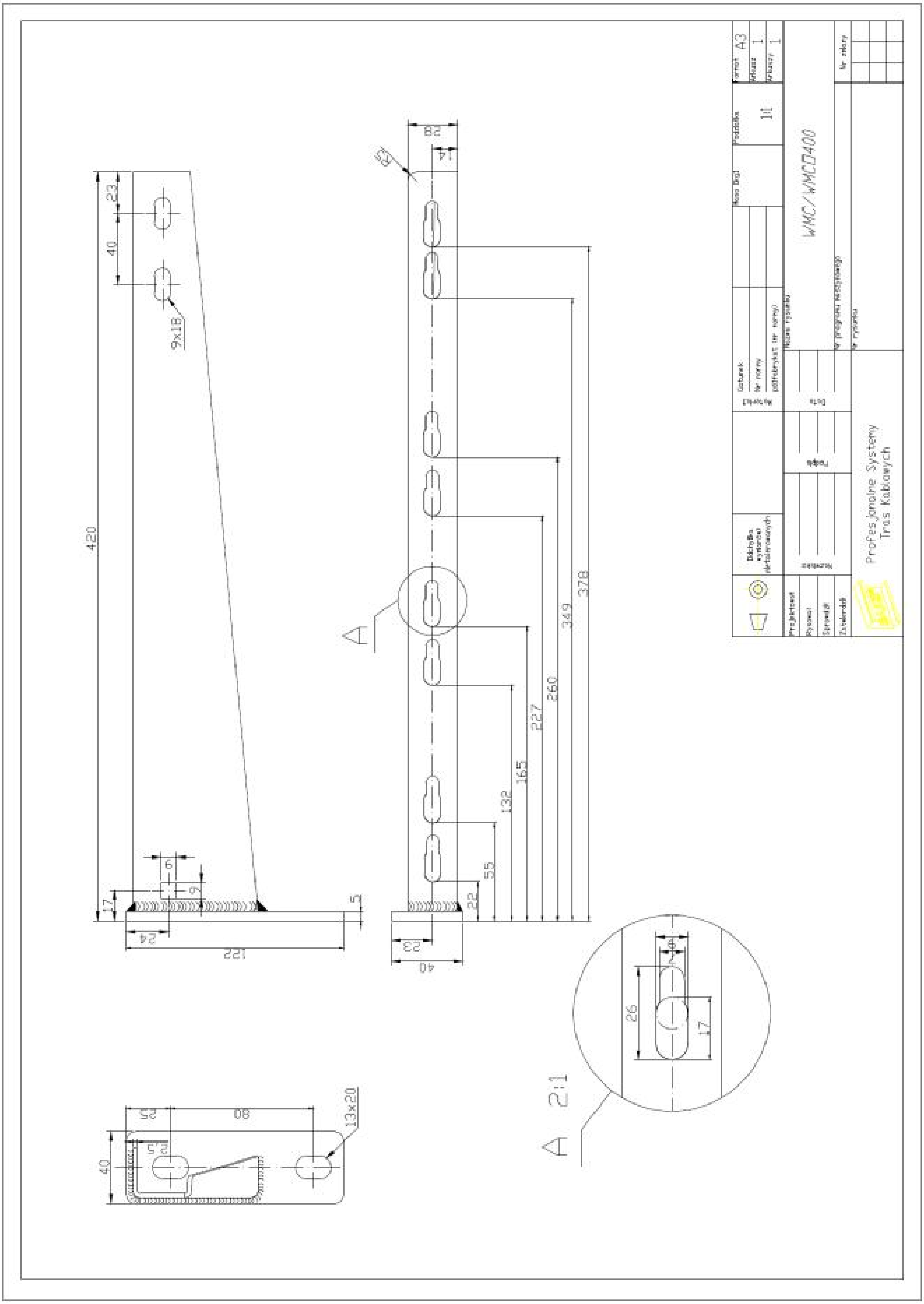
Nazwa rysunku: CWP/CWПP40H40/...

Nr zmiany

Nr rysunku

Profesjonalne Systemy Tras Kablowych

DRAWINGS



WMC/WMCD400
Profesjonalne Systemy Tras Kablowych
Format A3
2:1
A
420
378
349
260
227
165
132
55
22
122
40
9x18
13x20

DRAWINGS

System E-30, E-90 - Puszki łączeniowo-rozgałęźne

Puszka łączeniowo-rozgałęźna

PMO1

SYMBOL	nr katalogowy	szt.
PMO1(5/6)	801100	1
PMO1(5/3)	801200	1
PMO1(3/3)	801300	1

PMO1 E

PMO1(5/6) E	801101	1
PMO1(5/3) E	801201	1
PMO1(3/3) E	801301	1

INFORMACJA TECHNICZNA

Stosowana jako puszka:
- przelotowa o przekroju kabla od 0,5 mm² do 6 mm²,
- rozgałęźna o przekroju kabla od 0,5 mm² do 1,5 mm².

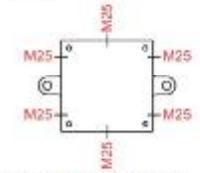
Puszka wykonywana jest w wersji :

PMO1 5/6 - 5 kostek zaciskowych, 6 dławików gumowych
PMO1 5/3 - 5 kostek zaciskowych, 3 dławiki gumowe
PMO1 3/3 - 3 kostki zaciskowe, 3 dławiki gumowe
PMO1 5/6 E - 5 kostek zaciskowych, 6 dławików gumowych
PMO1 5/3 E - 5 kostek zaciskowych, 3 dławiki gumowe
PMO1 3/3 E - 3 kostki zaciskowe, 3 dławiki gumowe

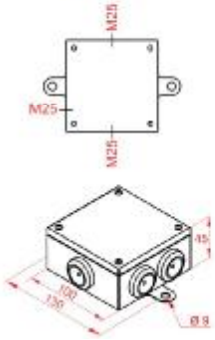
Maksymalne przekroje żył i ich ilość mieszcząca się w gnieździe kostki:

5 x 0,5 mm²	**1 x 2,5 mm²**
5 x 0,75 mm²	**1 x 4 mm²**
4 x 1 mm²	**1 x 6 mm²**
3 x 1,5 mm²	

PMO1 (5/6)



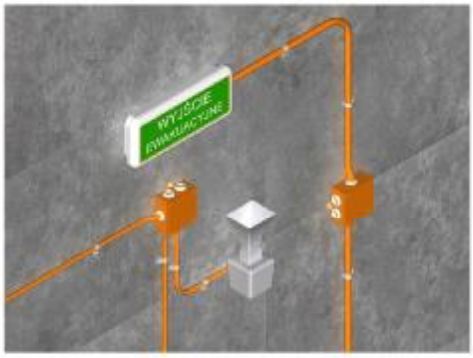
PMO1 (5/3) I PMO1 (3/3)



ZASTOSOWANIE

Puszka łączeniowa i rozgałęźna, Ui=400 V, z trwałym zachowaniem funkcji łączenia E30 / E60 / E90 wg DIN 4102 część 12.
Stopień ochrony IP54, zakres uszczelnienia od 7 mm do 18,5 mm. Mocowanie poprzez zewnętrzne uchwyty montażowe: do betonu za pomocą kołków stalowych SROM6x30, do drabinek i korytek kablowych za pomocą śruby SGKM8x12.

Puszka łączeniowo-rozgałęźna



PMO2

SYMBOL	nr katalogowy	szt.
PMO2(5/6)	802010	1
PMO2(5/3)	802020	1
PMO2(3/3)	802030	1

PMO2 E

PMO2(5/6) E	802011	1
PMO2(5/3) E	802021	1
PMO2(3/3) E	802031	1

INFORMACJA TECHNICZNA

Stosowana jako puszka:
- przelotowa o przekroju kabla od 1,0 mm² do 10 mm²,
- rozgałęźna o przekroju kabla od 1,0 mm² do 4 mm²,

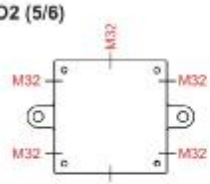
Puszka wykonywana jest w wersji :

PMO2 5/6 - 5 kostek zaciskowych, 6 dławików gumowych
PMO2 5/3 - 5 kostek zaciskowych, 3 dławiki gumowe
PMO2 3/3 - 3 kostki zaciskowe, 3 dławiki gumowe
PMO2 5/6 E - 5 kostek zaciskowych, 6 dławików gumowych
PMO2 5/3 E - 5 kostek zaciskowych, 3 dławiki gumowe
PMO2 3/3 E - 3 kostki zaciskowe, 3 dławiki gumowe

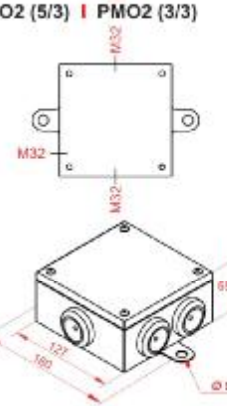
Maksymalne przekroje żył i ich ilość mieszcząca się w gnieździe kostki:

6 x 1 mm²	**2 x 4 mm²**
6 x 1,5 mm²	**1 x 6 mm²**
4 x 2,5 mm²	**1 x 10 mm²**

PMO2 (5/6)



PMO2 (5/3) I PMO2 (3/3)



ZASTOSOWANIE

Puszka łączeniowa i rozgałęźna, Ui=400 V, z trwałym zachowaniem funkcji łączenia E30 / E60 / E90 wg DIN 4102 część 12. Stopień ochrony Ip54, zakres uszczelnienia od 11 mm do 24 mm Mocowanie poprzez zewnętrzne uchwyty montażowe: do betonu za pomocą kołków stalowych SROM8x30, do drabinek i korytek kablowych za pomocą śruby SGKM8x12.

MATERIAŁ

PMO1, PMO2, - blacha stalowa, malowana proszkowo RAL 2003
PMO1 E, PMO2 E, - blacha kwasoodporna, 1.4301 malowana proszkowo RAL 2003
Kostka zaciskowa wykonana jest ze specjalnej ceramiki odpornej na wysokie temperatury, dławik wykonany jest z tworzywa bezhalogenowego mocowanie poprzez zewnętrzne uchwyty montażowe

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 STN 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:

Ing. Štefan Rástocký
leader of the testing laboratory

Prepared by:

Bc. Dávid Šubert
technician of the testing laboratory

8. NORMATIVE REFERENCES

STN EN 1363-1: 2001	Fire resistance tests. Part 1: General requirements
STN 92 0205:2012	Fire behaviour of construction products and building constructions.Circulit 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