TEST REPORT FIRES-FR-266-11-AUNE

Cable bearing system BAKS with cables business TECHNOKABEL

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Reg. No. 041/S-159

The Experts on Fire Safety

TEST REPORT

FIRES-FR-266-11-AUNE

Tested property:	Function in fire
Test method:	DIN 4102 – 12:1998-11
Date of issue:	23. 02. 2012
Name of the product:	Cable bearing system BAKS with cables business TECHNOKABEL
Manufacturer:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland - producer of construction TECHNOKABEL S.A., Nasielska 55, 04-343 Warszawa, Poland – producer of cables
Sponsor:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland
Task No.:	PR-11-0327
Specimens received:	12. 12. 2011
Date of the test:	15. 12. 2011

Technician responsible for the technical side of this report: Miroslav Hudák

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1. INTRODUCTION

This test report contains the results of test carried out by testing laboratory of FIRES, s.r.o. in Batizovce. The purpose of the test was acquirement of information for product classification.

Representatives from the sponsor's side witnessing the test:

Mr. Jacek Kliczek	BAKS Kazimierz Sielski
Mr. Dariusz Gowronski	BAKS Kazimierz Sielski
Mr. Mariusz Kwiatkowski	TECHNOKABEL S.A.
Mr. Pavel Stradomski	TECHNOKABEL S.A.

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

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
F 10 521 - F 10 528	Plate thermometers	temperature inside the test furnace, according to STN 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 TECHNOKABEL S.A. under supervision of laboratory technician.

4. PREPARATION OF THE TEST

4.1 DESCRIPTION OF THE SPECIMENS STRUCTURE

Test specimen comprised from cable bearing system BAKS Kazimierz Sielski – cable trays KCOP, KSOJ, KGOJ and KGOL, cable mesh trays KDSO, cable ladders DGOP and DUOP, cable clips OZSO and UDF with accessories and power and communication halogen free cables of TECHNOKABEL S.A. company.

Cables

Used cables by test:	NHXH-J FE180 PH30/E30 4x1,5 RE	(8 x)
	NHXH-J FE180 PH30/E30 4x50 RM	(8 x)
	NHXCH FE180 PH30/E30 4x1,5/1,5 RE	(4 x)
	NHXCH FE180 PH30/E30 4x50/25 RM	(4 x)
	(N)HXH-J FE180 PH30/E30 4x1,5 RE	(6 x)
	(N)HXH-J FE180 PH30/E30 4x50 RM	(6 x)
	(N)HXCH FE180 PH30/E30 4x1,5/1,5 RE	(4 x)
	(N)HXCH FE180 PH30/E30 4x50/25 RM	(4 x)
	NHXH-J FE180 PH90/E90 4x1,5 RE	(18 x)
	NHXH-J FE180 PH90/E90 4x50 RM	(12 x)
	NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	(4 x)
	NHXCH FE180 PH90/E90 4x50/25 RM	(4 x)
	(N)HXH-J FE180 PH90/E90 4x1,5 RE	(18 x)
	(N)HXH-J FE180 PH90/E90 4x50 RM	(18 x)
	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	(12 x)
	HTKSH FE180 PH90/E90 1x2x0,8 mm	(12 x)
	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	(14 x)
	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	(12 x)

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

Power and communication halogen free cables were fixed on the ladders by steel clips according to the cable diameter in the points of allowed bending radius.
Power and communication halogen free cables were not fixed in the trays and mesh trays by steel clips in the points of allowed bending radius. They were fixed only by plastic clips.

Cable bearing systems were made of following constructions:

Suspension tracks No. 1, 2, 3, 4, 5 and 6
Tracks were made by three consoles combined of three horizontal supports (type CWOP40H40-L) and three threaded rods (type PGM10/1x1000) fixed by washers (type PW10) and nuts (type NSM10) which were fixed to ceiling by three dowels (type TRSO M10x40) in spacing of 1500 mm.
Trays (type 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm) were fixed at upper horizontal supports and jointed together by two junctions on sides (type LPOPH60N-L) and steel sheet on the bottom of the tray (type BLO600N-L) by screws (type SGNM6x12). Trays were loaded with 15 $kg.m^{-1}$.
Ladders (type DUOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 300 mm) were fixed at central horizontal supports by clips (type ZMO) and jointed together by steel sheets (type LDOPCH60N-L) with screws (type SGNM8x14). Ladders were loaded with 20 $kg.m^{-1}$.
Mesh trays (type KDSO 600H60/3L with polyurethane coat, steel wire Ø 5,1 mm) were fixed at under horizontal supports and jointed together by six junctions (type USSO).
Mesh trays were loaded with 20 $kg.m^{-1}$. All bearing systems were painted by polyurethane powder coating.

Suspension tracks No. 7, 8, 9 and 9a
Tracks were made by three consoles combined of three horizontal supports (type CWOP40H40/05 F) and two threaded rods (type PGM10/1x1000) fixed by washers (type PW10) and nuts (type NSM10) which were fixed to ceiling by two dowels (type TRSO M10x40) in spacing of 1500 mm.
Trays (type KSOJ 400H60/3N, steel sheet thickness 0,9 mm) were fixed at upper horizontal supports by screws (type SGNM6x12) and jointed together by six screws (type SGNM6x12). Trays were loaded with 15 $kg.m^{-1}$.
Trays (type KGOJ 400H60/3N, steel sheet thickness 0,9 mm) were fixed at central horizontal supports by screws (type SGNM6x12) and jointed together by nine screws (type SGNM6x12). Trays were loaded with 15 $kg.m^{-1}$.

Trays (type KGOL 200H60/3N, steel sheet thickness 0,7) and trays (type KGOL 100H60/3N, steel sheet thickness 0,7 mm) were fixed at under horizontal supports by screws (type SGNM6x12) and jointed together by four screws (type SGNM6x12). Trays were loaded with 15 kg.m^{-1}.
All bearing systems were from steel, galvanized according to the Sendzimir method PN-EN 10327:2005.

Suspension tracks No. 10, 11 and 12
Tracks were made by three consoles (type WPCO 1000) which were fixed to ceiling by two dowels (type PSRO M10x80) in spacing of 1500 mm. Three booms (type WMCO 400) were fixed by screws (type SMM10x20) at each console. Holders (type UPWO F) were fixed at the end of booms with screws (type SGNM8x14). Booms were fixed through these holders by threaded rods (type PGM10/1x1000) by washers (type PW10) and nuts (type NSM10) to ceiling by dowels (type TRSO M10x40).
Trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm) were fixed at upper booms and jointed together by two junctions on sides (type LPOPH60N) and steel sheet on the bottom of the tray (type BLO400N) by screws (type SGNM6x12). Trays were loaded with 15 kg.m^{-1}.
Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were fixed at central booms by clips (type ZMO) and jointed together by junction (type LDOCH60N) with screws (type SGNM8x14). Ladders were loaded with 20 kg.m^{-1}.
Mesh trays (type KDSO 400H60/3N, steel wire Ø 4,5 mm) were fixed at under booms and jointed together by four junctions (type USSO). Mesh trays were loaded with 20 kg.m^{-1}.
All bearing systems were from steel, galvanized according to the Sendzimir method PN-EN 10327:2005.

Suspension track No. 13
Track was made of cable holders (type UDF) which were fixed to wall by dowels (type SRO M6x30) in spacing of 300 mm. Cable holders with cables were placed under gypsum plaster.

Suspension track No. 14
Track was made of cable holders (type UDF) which were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm. Cable holders with cables were painted by white acrylic coating.

Suspension track No. 15
Track was made of cable holders (type OZSO) which were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.

Suspension track No. 16
Track was made by three booms (type WPTO 100) which were fixed to wall by two dowels (type PSRO M10x80) in spacing of 1500 mm.
Trays (type KCOP 100H60/3N, steel sheet thickness 1,5 mm) were fixed at booms and jointed together by two junctions on sides (type LPOPH60N) and steel sheet on the bottom of the tray (type BLO100N) by screws (type SGNM6x12). Trays were loaded with 10 kg.m^{-1}.

Suspension track No. 17 and 17a
Tracks were made by four ladders (type DGOP 400H60/N, length 1000 mm, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) with fire box (width 500 mm) from board Promat (thickness 30 mm), supply by mineral wool Rockwool (bulk weight 120 kg.m^{-3}). Two fire boxes were high 200 mm and two fire boxes were high 300 mm.
Ladders were fixed to wall by four consoles (type UTMO) with screws (type SGNM8x14) by dowels (type PSRO M10x80) in spacing of 600 mm. Boxes were fixed by two threaded rods (type PGM6/1) with washers (type PP6) and nuts (type NS M6) which were fixed to wall by two dowels (type TRSO M6x30) in spacing of 340 mm. Cables (length 1000 mm) were fixed to ladders by cable clips UKO1 and additional load was fixed to ladder which weight was equal to 2,5 m of the cable, (total weight 1 m + 2,5 m = 3,5 m).

Cable penetration through the wall of test furnace was sealed by mineral wool Rockwool.
Loading with steel chain and line steel weight with length 400 mm was used as the equivalent load.

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 concrete panels made of common shocked concrete of class B 20, 150 mm thick.
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	14,1
standard deviation	1,2

Relative air humidity [%]

mean	40,6
standard deviation	4,1

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

5. CARRYING OUT OF THE TEST

5.1 TEST GENERALLY

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

5.2 CONDITIONS OF THE TEST

Conditions in the test furnace (temperature – standard temperature/time curve, pressure, content of 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]
15. 12. 2011	34,7	13,3

5.3 RESULTS OF THE TEST

Measured values are stated in this test report.
Suspension track No. 17 and 17a were tested only information. All cables NHXH-J FE180 PH30/E30 4x50 RM fell down from boxes.

6. CLOSING

Evaluation of the test:

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
1	2 cables (N)HXCH FE180 PH30/E30 4x50/25 RM	12	90 minutes no failure / interruption
2	2 cables (N)HXCH FE180 PH30/E30 4x1,5/1,5 RE	12	90 minutes no failure / interruption
3	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	11	90 minutes no failure / interruption
4	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM	11	90 minutes no failure / interruption
5	2 cables NHXCH FE180 PH30/E30 4x50/25 RM	11	85 minutes
6	2 cables NHXCH FE180 PH30/E30 4x1,5/1,5 RE	11	90 minutes no failure / interruption
7	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	10	90 minutes no failure / interruption
8	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM	10	90 minutes no failure / interruption
9	2 cables NHXCH FE180 PH90/E90 4x50/25 RM	10	90 minutes no failure / interruption
10	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	10	90 minutes no failure / interruption
11	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	9a	30 minutes
12	2 cables NHXH-J FE180 PH90/E90 4x50 RM	9a	90 minutes no failure / interruption
13	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	9	30 minutes
14	2 cables NHXH-J FE180 PH90/E90 4x50 RM	9	90 minutes no failure / interruption
15	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	8	90 minutes no failure / interruption
16	2 cables NHXCH FE180 PH90/E90 4x50/25 RM	8	90 minutes no failure / interruption
17	2 cables NHXCH FE180 PH30/E30 4x50/25 RM	8	90 minutes no failure / interruption
18	2 cables NHXCH FE180 PH30/E30 4x1,5/1,5 RE	8	90 minutes no failure / interruption
19	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	7	90 minutes no failure / interruption
20	2 cables NHXH-J FE180 PH90/E90 4x50 RM	7	90 minutes no failure / interruption
21	2 cables NHXH-J FE180 PH30/E30 4x50 RM	7	90 minutes no failure / interruption
22	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	7	90 minutes no failure / interruption
23	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	15	90 minutes no failure / interruption
24	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	6	34 minutes
25	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM	6	19 minutes
26	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM	6	19 minutes
27	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE	6	33 minutes
28	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	5	90 minutes no failure / interruption
29	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM	5	90 minutes no failure / interruption
30	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM	5	90 minutes no failure / interruption
31	2 cables (N)HXCH FE180 PH30/E30 4x50/25 RM	5	90 minutes no failure / interruption
32	2 cables (N)HXCH FE180 PH30/E30 4x1,5/1,5 RE	5	90 minutes no failure / interruption
33	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE	5	90 minutes no failure / interruption
34	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	4	90 minutes no failure / interruption
35	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM	4	90 minutes no failure / interruption
36	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM	4	90 minutes no failure / interruption
37	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE	4	90 minutes no failure / interruption
38	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	3	28 minutes
39	2 cables NHXH-J FE180 PH90/E90 4x50 RM	3	34 minutes
40	2 cables NHXH-J FE180 PH30/E30 4x50 RM	3	13 minutes
41	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	3	32 minutes
42	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	2	52 minutes
43	2 cables NHXH-J FE180 PH90/E90 4x50 RM	2	90 minutes no failure / interruption
44	2 cables NHXH-J FE180 PH30/E30 4x50 RM	2	47 minutes
45	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	2	28 minutes
46	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	1	90 minutes no failure / interruption
47	2 cables NHXH-J FE180 PH90/E90 4x50 RM	1	90 minutes no failure / interruption
48	2 cables NHXH-J FE180 PH30/E30 4x50 RM	1	90 minutes no failure / interruption
49	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	1	90 minutes no failure / interruption

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
50	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	14	90 minutes no failure / interruption
51	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	13	90 minutes no failure / interruption
52A	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	16	90 minutes no failure / interruption
52B	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	16	90 minutes no failure / interruption
53A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	16	90 minutes no failure / interruption
53B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	16	90 minutes no failure / interruption
54A	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	12	90 minutes no failure / interruption
54B	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	12	90 minutes no failure / interruption
55A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	15	90 minutes no failure / interruption
55B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	15	90 minutes no failure / interruption
56A	HTKSH FE180 PH90/E90 1x2x0,8 mm	15	90 minutes no failure / interruption
56B	HTKSH FE180 PH90/E90 1x2x0,8 mm	15	90 minutes no failure / interruption
57A	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	15	90 minutes no failure / interruption
57B	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	15	90 minutes no failure / interruption
58A	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	3	32 minutes
58B	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	3	31 minutes
59A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	3	63 minutes
59B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	3	42 minutes
60A	HTKSH FE180 PH90/E90 1x2x0,8 mm	3	36 minutes
60B	HTKSH FE180 PH90/E90 1x2x0,8 mm	3	33 minutes
61A	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	2	90 minutes no failure / interruption
61B	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	2	41 minutes
62A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	2	90 minutes no failure / interruption
62B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	2	90 minutes no failure / interruption
63A	HTKSH FE180 PH90/E90 1x2x0,8 mm	2	90 minutes no failure / interruption
63B	HTKSH FE180 PH90/E90 1x2x0,8 mm	2	90 minutes no failure / interruption
64A	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	1	90 minutes no failure / interruption
64B	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	1	90 minutes no failure / interruption
65A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	1	90 minutes no failure / interruption
65B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	1	90 minutes no failure / interruption
66A	HTKSH FE180 PH90/E90 1x2x0,8 mm	1	90 minutes no failure / interruption
66B	HTKSH FE180 PH90/E90 1x2x0,8 mm	1	90 minutes no failure / interruption
67A	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	14	90 minutes no failure / interruption
67B	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	14	68 minutes
68A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	14	90 minutes no failure / interruption
68B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	14	90 minutes no failure / interruption
69A	HTKSH FE180 PH90/E90 1x2x0,8 mm	14	90 minutes no failure / interruption
69B	HTKSH FE180 PH90/E90 1x2x0,8 mm	14	90 minutes no failure / interruption
70A	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	13	90 minutes no failure / interruption
70B	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	13	90 minutes no failure / interruption
71A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	13	90 minutes no failure / interruption
71B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	13	90 minutes no failure / interruption
72A	HTKSH FE180 PH90/E90 1x2x0,8 mm	13	90 minutes no failure / interruption
72B	HTKSH FE180 PH90/E90 1x2x0,8 mm	13	90 minutes no failure / interruption

The fire test was discontinued in 93rd minute at the request of test sponsor.

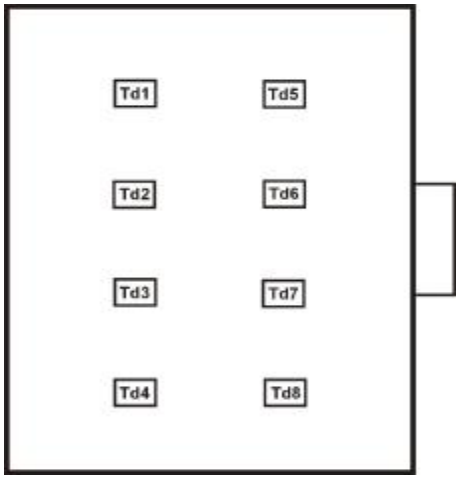
Specimens S1 – S51 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S72 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.
Circuit breakers with rating 3 A were used.

Measured values inside the test furnace

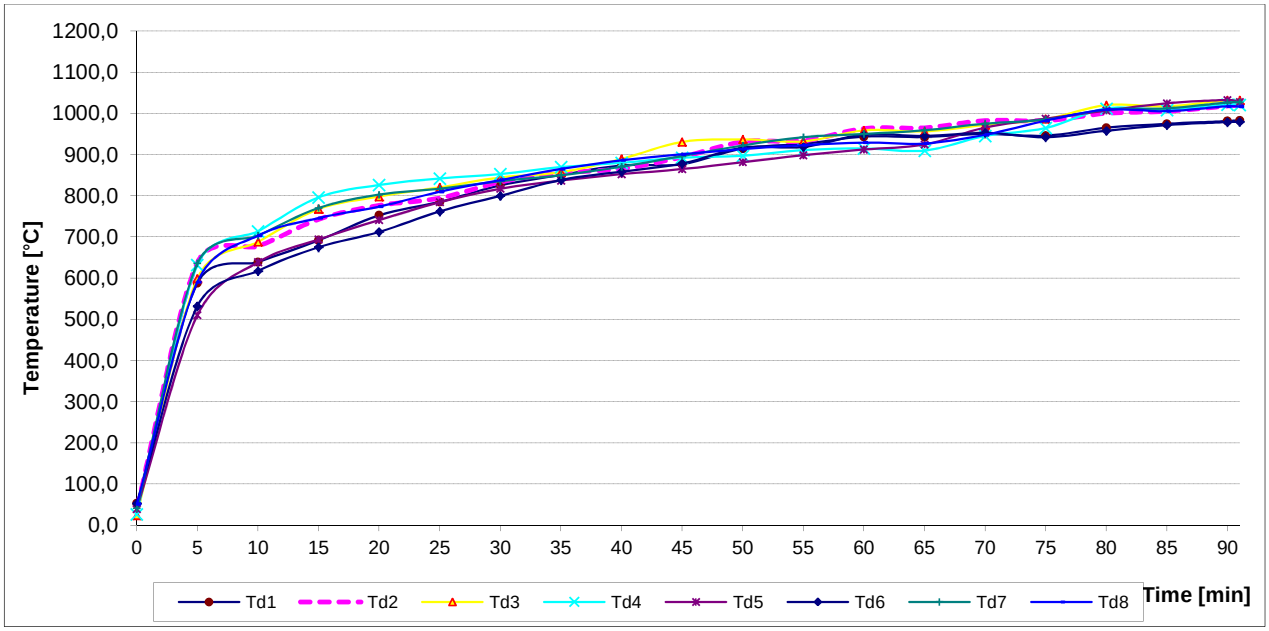
Time	Temperature [°C]											Deviation	Pressure
t [min]	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To	d_e [%]	p [Pa]
0	53,4	42,5	24,4	26,6	39,4	52,6	41,6	51,2	41,5	20,0	13,3	0,0	11,7
5	588,2	638,3	599,0	632,4	510,4	532,4	636,0	591,2	591,0	576,0	14,7	-12,5	18,3
10	639,4	677,8	688,1	714,0	638,8	617,8	703,4	703,3	672,8	678,0	14,3	-5,3	17,7
15	692,0	743,3	767,8	796,3	694,2	675,3	770,7	746,1	735,7	739,0	14,1	-3,6	17,7
20	752,9	776,9	798,3	826,5	741,3	712,4	803,0	773,9	773,2	781,0	14,0	-2,8	17,8
25	785,5	794,5	820,7	842,3	784,6	762,5	817,4	810,1	802,2	815,0	13,9	-2,5	18,4
30	825,7	833,6	844,8	853,3	817,5	800,1	836,0	838,5	831,2	842,0	13,9	-2,3	19,1
35	850,9	855,6	857,5	869,8	837,3	838,6	850,1	865,2	853,1	865,0	14,1	-2,1	17,6
40	873,9	866,0	889,9	880,5	852,8	858,8	870,8	886,5	872,4	885,0	14,1	-2,0	17,4
45	877,0	894,2	931,1	892,8	865,1	878,6	896,6	901,0	892,1	902,0	14,4	-1,9	18,1
50	915,1	931,4	937,3	897,2	881,7	917,0	922,5	913,8	914,5	918,0	14,6	-1,8	18,9
55	926,2	933,4	932,3	911,1	898,7	919,0	942,7	923,2	923,3	932,0	14,8	-1,6	19,8
60	943,8	963,6	959,0	915,2	912,6	948,7	950,6	929,6	940,4	945,0	15,0	-1,6	18,4
65	943,0	965,3	956,7	910,0	924,9	945,5	959,3	927,1	941,5	957,0	14,9	-1,6	19,3
70	950,5	982,9	972,1	945,5	966,0	953,0	975,4	948,3	961,7	968,0	14,8	-1,5	18,2
75	946,3	982,6	986,6	964,9	987,7	942,6	985,4	982,6	972,3	979,0	14,7	-1,5	19,1
80	965,4	1000,6	1020,2	1012,3	1007,1	958,2	1009,7	1009,5	997,9	988,0	14,6	-1,3	19,5
85	975,1	1005,5	1017,5	1008,6	1025,0	972,0	1012,7	1005,9	1002,8	997,0	14,5	-1,2	19,1
90	981,7	1018,3	1032,5	1022,2	1033,0	979,4	1026,8	1017,9	1014,0	1006,0	14,4	-1,1	19,3
91	983,7	1020,4	1032,4	1021,4	1028,0	980,1	1027,8	1016,8	1013,8	1008,0	14,4	-1,0	19,0
92	985,4	1021,0	1032,2	1023,9	1030,3	982,3	1028,8	1019,1	1015,4	1009,0	14,3	-1,0	19,3

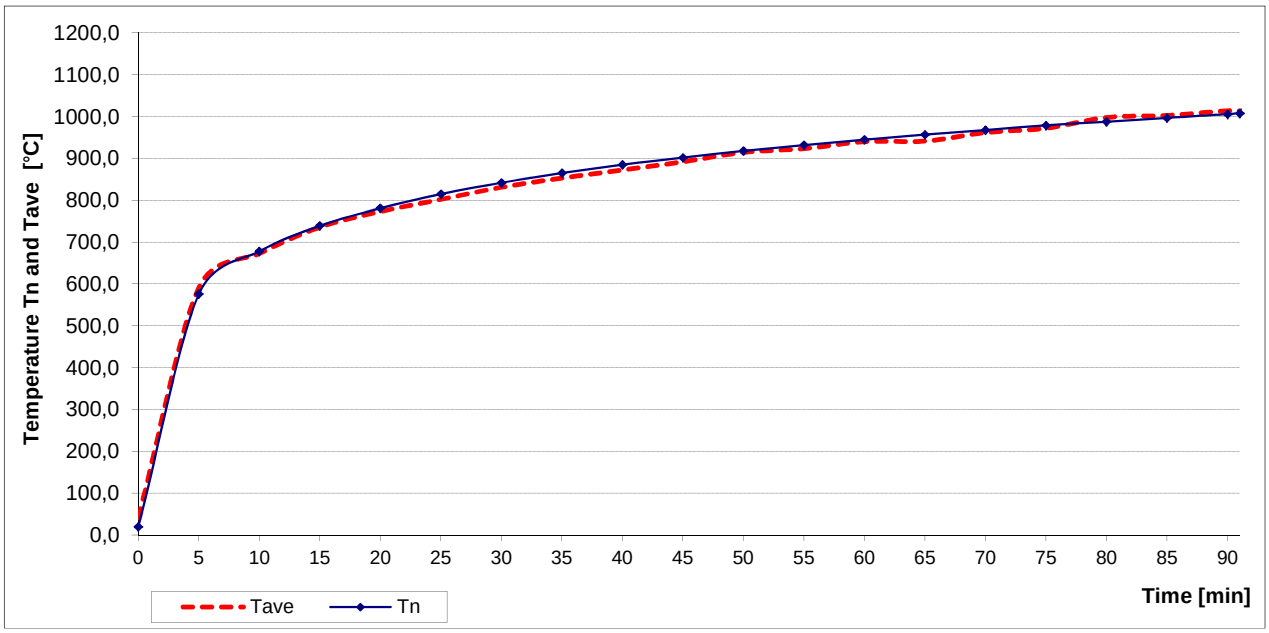
Tave Average temperature in the test furnace calculated from plate thermometers
Tn Standard temperature in the test furnace laid down to test guideline
To Ambient temperature
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline
p Pressure inside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

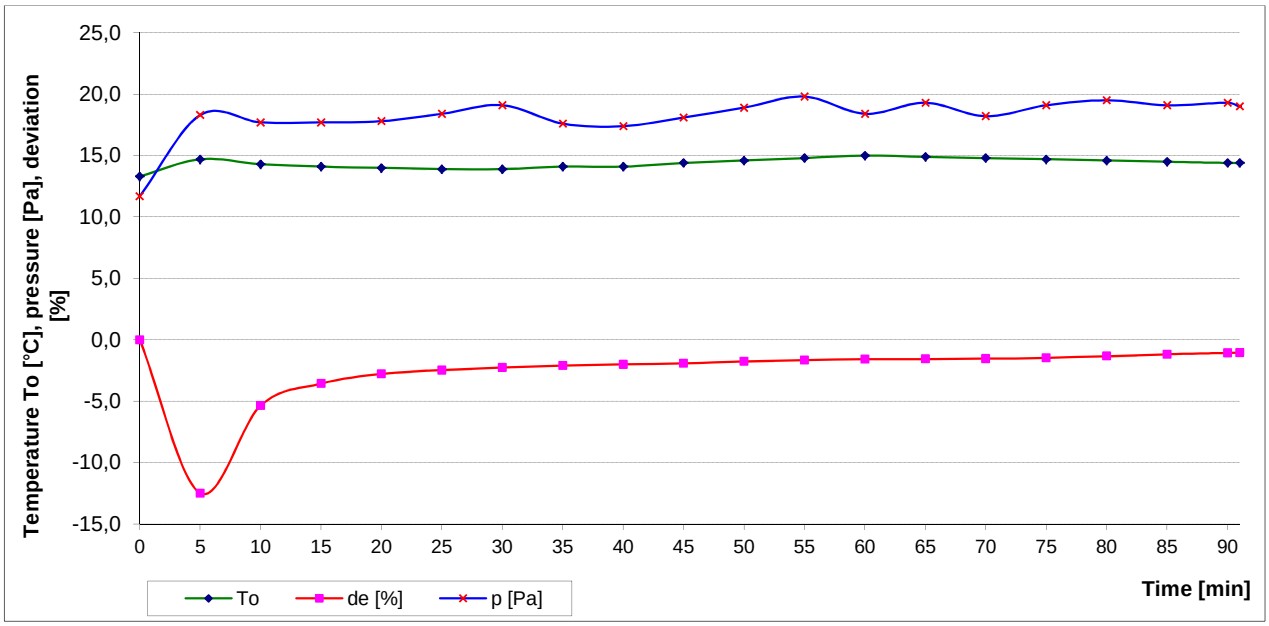
Layout of measuring points inside the test furnace:



Measured values inside the test furnace /graph







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

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S1	1-L1	no failure / interruption
	2-L2	no failure / interruption
	3-L3	no failure / interruption
	4-PEN	no failure / interruption
S2	5-L1	no failure / interruption
	6-L2	no failure / interruption
	7-L3	no failure / interruption
	8-PEN	no failure / interruption
S3	9-L1	no failure / interruption
	10-L2	no failure / interruption
	11-L3	no failure / interruption
	12-PEN	no failure / interruption
S4	13-L1	no failure / interruption
	14-L2	no failure / interruption
	15-L3	no failure / interruption
	16-PEN	no failure / interruption
S5	17-L1	x
	18-L2	x
	19-L3	85:39
	20-PEN	x
S6	21-L1	no failure / interruption
	22-L2	no failure / interruption
	23-L3	no failure / interruption
	24-PEN	no failure / interruption
S7	25-L1	no failure / interruption
	26-L2	no failure / interruption
	27-L3	no failure / interruption
	28-PEN	no failure / interruption
S8	29-L1	no failure / interruption
	30-L2	no failure / interruption
	31-L3	no failure / interruption
	32-PEN	no failure / interruption
S9	33-L1	no failure / interruption
	34-L2	no failure / interruption
	35-L3	no failure / interruption
	36-PEN	no failure / interruption
S10	37-L1	no failure / interruption
	38-L2	no failure / interruption
	39-L3	no failure / interruption
	40-PEN	no failure / interruption

Specimen No.	Cables
1	2 cables (N)HXCH FE180 PH30/E30 4x50/25 RM
2	2 cables (N)HXCH FE180 PH30/E30 4x1,5/1,5 RE
3	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
4	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM
5	2 cables NHXCH FE180 PH30/E30 4x50/25 RM
6	2 cables NHXCH FE180 PH30/E30 4x1,5/1,5 RE
7	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
8	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM
9	2 cables NHXCH FE180 PH90/E90 4x50/25 RM
10	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE

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	30:54
	42-L2	x
	43-L3	x
	44-PEN	x
S12	45-L1	no failure / interruption
	46-L2	no failure / interruption
	47-L3	no failure / interruption
	48-PEN	no failure / interruption
S13	49-L1	30:32
	50-L2	x
	51-L3	x
	52-PEN	x
S14	53-L1	no failure / interruption
	54-L2	no failure / interruption
	55-L3	no failure / interruption
	56-PEN	no failure / interruption
S15	57-L1	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	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
12	2 cables NHXH-J FE180 PH90/E90 4x50 RM
13	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
14	2 cables NHXH-J FE180 PH90/E90 4x50 RM
15	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE
16	2 cables NHXCH FE180 PH90/E90 4x50/25 RM
17	2 cables NHXCH FE180 PH30/E30 4x50/25 RM
18	2 cables NHXCH FE180 PH30/E30 4x1,5/1,5 RE
19	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
20	2 cables NHXH-J FE180 PH90/E90 4x50 RM

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

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

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S21	81-L1	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	34:37
	94-L2	x
	95-L3	x
	96-PEN	x
S25	97-L1	19:02
	98-L2	x
	99-L3	x
	100-PEN	x
S26	101-L1	19:40
	102-L2	x
	103-L3	x
	104-PEN	x
S27	105-L1	33:07
	106-L2	x
	107-L3	x
	108-PEN	x
S28	109-L1	no failure / interruption
	110-L2	no failure / interruption
	111-L3	no failure / interruption
	112-PEN	no failure / interruption
S29	113-L1	no failure / interruption
	114-L2	no failure / interruption
	115-L3	no failure / interruption
	116-PEN	no failure / interruption
S30	117-L1	no failure / interruption
	118-L2	no failure / interruption
	119-L3	no failure / interruption
	120-PEN	no failure / interruption

Specimen No.	Cables
21	2 cables NHXH-J FE180 PH30/E30 4x50 RM
22	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE
23	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
24	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
25	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM
26	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM
27	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE
28	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
29	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM
30	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM

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

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

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S31	121-L1	no failure / interruption
	122-L2	no failure / interruption
	123-L3	no failure / interruption
	124-PEN	no failure / interruption
S32	125-L1	no failure / interruption
	126-L2	no failure / interruption
	127-L3	no failure / interruption
	128-PEN	no failure / interruption
S33	129-L1	no failure / interruption
	130-L2	no failure / interruption
	131-L3	no failure / interruption
	132-PEN	no failure / interruption
S34	133-L1	no failure / interruption
	134-L2	no failure / interruption
	135-L3	no failure / interruption
	136-PEN	no failure / interruption
S35	137-L1	no failure / interruption
	138-L2	no failure / interruption
	139-L3	no failure / interruption
	140-PEN	no failure / interruption
S36	141-L1	no failure / interruption
	142-L2	no failure / interruption
	143-L3	no failure / interruption
	144-PEN	no failure / interruption
S37	145-L1	no failure / interruption
	146-L2	no failure / interruption
	147-L3	no failure / interruption
	148-PEN	no failure / interruption
S38	149-L1	x
	150-L2	x
	151-L3	x
	152-PEN	28:19
S39	153-L1	x
	154-L2	x
	155-L3	34:44
	156-PEN	x
S40	157-L1	13:10
	158-L2	x
	159-L3	x
	160-PEN	x

Specimen No.	Cables
31	2 cables (N)HXCH FE180 PH30/E30 4x50/25 RM
32	2 cables (N)HXCH FE180 PH30/E30 4x1,5/1,5 RE
33	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE
34	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
35	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM
36	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM
37	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE
38	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
39	2 cables NHXH-J FE180 PH90/E90 4x50 RM
40	2 cables NHXH-J FE180 PH30/E30 4x50 RM

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 S51 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S41	161-L1	x
	162-L2	32:21
	163-L3	x
	164-PEN	x
S42	165-L1	x
	166-L2	52:01
	167-L3	x
	168-PEN	x
S43	169-L1	no failure / interruption
	170-L2	no failure / interruption
	171-L3	no failure / interruption
	172-PEN	no failure / interruption
S44	173-L1	x
	174-L2	x
	175-L3	47:57
	176-PEN	x
S45	177-L1	x
	178-L2	28:09
	179-L3	28:09
	180-PEN	x
S46	181-L1	no failure / interruption
	182-L2	no failure / interruption
	183-L3	no failure / interruption
	184-PEN	no failure / interruption
S47	185-L1	no failure / interruption
	186-L2	no failure / interruption
	187-L3	no failure / interruption
	188-PEN	no failure / interruption
S48	189-L1	no failure / interruption
	190-L2	no failure / interruption
	191-L3	no failure / interruption
	192-PEN	no failure / interruption
S49	193-L1	no failure / interruption
	194-L2	no failure / interruption
	195-L3	no failure / interruption
	196-PEN	no failure / interruption
S50	197-L1	no failure / interruption
	198-L2	no failure / interruption
	199-L3	no failure / interruption
	200-PEN	no failure / interruption
S51	201-L1	no failure / interruption
	202-L2	no failure / interruption
	203-L3	no failure / interruption
	204-PEN	no failure / interruption

Specimen No.	Cables
41	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE
42	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
43	2 cables NHXH-J FE180 PH90/E90 4x50 RM
44	2 cables NHXH-J FE180 PH30/E30 4x50 RM
45, 49	4 cables NHXH-J FE180 PH30/E30 4x1,5 RE
46, 50, 51	6 cables NHXH-J FE180 PH90/E90 4x1,5 RE
47	2 cables NHXH-J FE180 PH90/E90 4x50 RM
48	2 cables NHXH-J FE180 PH30/E30 4x50 RM

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 S52 to S61 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S52A	209-L	no failure / interruption
	210-PEN	no failure / interruption
S52B	211-L	no failure / interruption
	212-PEN	no failure / interruption
S53A	213-L	no failure / interruption
	214-PEN	no failure / interruption
S53B	215-L	no failure / interruption
	216-PEN	no failure / interruption
S54A	217-L	no failure / interruption
	218-PEN	no failure / interruption
S54B	219-L	no failure / interruption
	220-PEN	no failure / interruption
S55A	221-L	no failure / interruption
	222-PEN	no failure / interruption
S55B	223-L	no failure / interruption
	224-PEN	no failure / interruption
S56A	225-L	no failure / interruption
	226-PEN	no failure / interruption
S56B	227-L	no failure / interruption
	228-PEN	no failure / interruption
S57A	229-L	no failure / interruption
	230-PEN	no failure / interruption
S57B	231-L	no failure / interruption
	232-PEN	no failure / interruption
S58A	233-L	32:49
	234-PEN	x
S58B	235-L	31:29
	236-PEN	x
S59A	237-L	63:57
	238-PEN	x
S59B	239-L	42:40
	240-PEN	x
S60A	241-L	36:18
	242-PEN	x
S60B	243-L	33:57
	244-PEN	x
S61A	245-L	no failure / interruption
	246-PEN	no failure / interruption
S61B	247-L	41:02
	248-PEN	x

Specimen No.	Cables
52A, B	2 cables JE-H(St)H FE180 PH90/E90 1x2x0,8 mm
53A, B	2 cables HTKSHekw FE180 PH90/E90 1x2x0,8 mm
54A, B	2 cables JE-H(St)H FE180 PH90/E90 1x2x0,8 mm
55A, B	2 cables HTKSHekw FE180 PH90/E90 1x2x0,8 mm
56A, B	2 cables HTKSH FE180 PH90/E90 1x2x0,8 mm
57A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm2
58A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm2
59A, B	2 cables HTKSHekw FE180 PH90/E90 1x2x0,8 mm
60A, B	2 cables HTKSH FE180 PH90/E90 1x2x0,8 mm
61A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm2

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 S72 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S62A	249-L	no failure / interruption
	250-PEN	no failure / interruption
S62B	251-L	no failure / interruption
	252-PEN	no failure / interruption
S63A	253-L	no failure / interruption
	254-PEN	no failure / interruption
S63B	255-L	no failure / interruption
	256-PEN	no failure / interruption
S64A	257-L	no failure / interruption
	258-PEN	no failure / interruption
S64B	259-L	no failure / interruption
	260-PEN	no failure / interruption
S65A	261-L	no failure / interruption
	262-PEN	no failure / interruption
S65B	263-L	no failure / interruption
	264-PEN	no failure / interruption
S66A	265-L	no failure / interruption
	266-PEN	no failure / interruption
S66B	267-L	no failure / interruption
	268-PEN	no failure / interruption
S67A	269-L	no failure / interruption
	270-PEN	no failure / interruption
S67B	271-L	68:53
	272-PEN	x
S68A	273-L	no failure / interruption
	274-PEN	no failure / interruption
S68B	275-L	no failure / interruption
	276-PEN	no failure / interruption
S69A	277-L	no failure / interruption
	278-PEN	no failure / interruption
S69B	279-L	no failure / interruption
	280-PEN	no failure / interruption
S70A	281-L	no failure / interruption
	282-PEN	no failure / interruption
S70B	283-L	no failure / interruption
	284-PEN	no failure / interruption
S71A	285-L	no failure / interruption
	286-PEN	no failure / interruption
S71B	287-L	no failure / interruption
	288-PEN	no failure / interruption
S72A	289-L	no failure / interruption
	290-PEN	no failure / interruption
S72B	291-L	no failure / interruption
	292-PEN	no failure / interruption

Specimen No.	Cables
62A, B	2 cables HTKSHekw FE180 PH90/E90 1x2x0,8 mm
63A, B	2 cables HTKSH FE180 PH90/E90 1x2x0,8 mm
64A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm2
65A, B	2 cables HTKSHekw FE180 PH90/E90 1x2x0,8 mm
66, 69, 72	6 cables HTKSH FE180 PH90/E90 1x2x0,8 mm
67, 70	4 cables HDGs FE180 PH90/E30-E90 2x1,0 mm2
68, 71	4 cables HTKSHekw FE180 PH90/E90 1x2x0,8 mm

x Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
Signal cables were tested by three-phase voltage supply 1 x 110V with LED 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 after the test.

Photo taken after the test.

Photo taken after the test.

PHOTOS

Photo taken after the test.

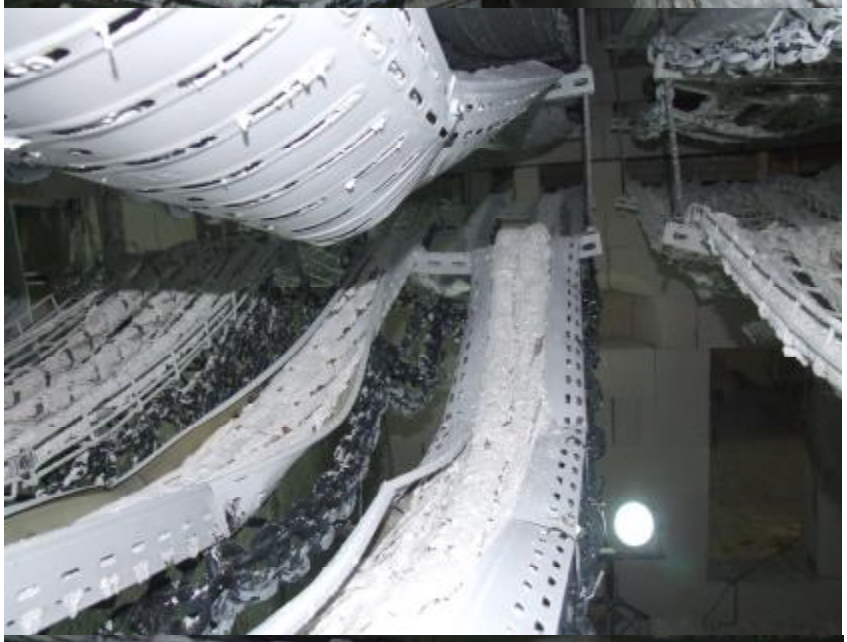


Photo taken after the test.

Photo taken after the test.

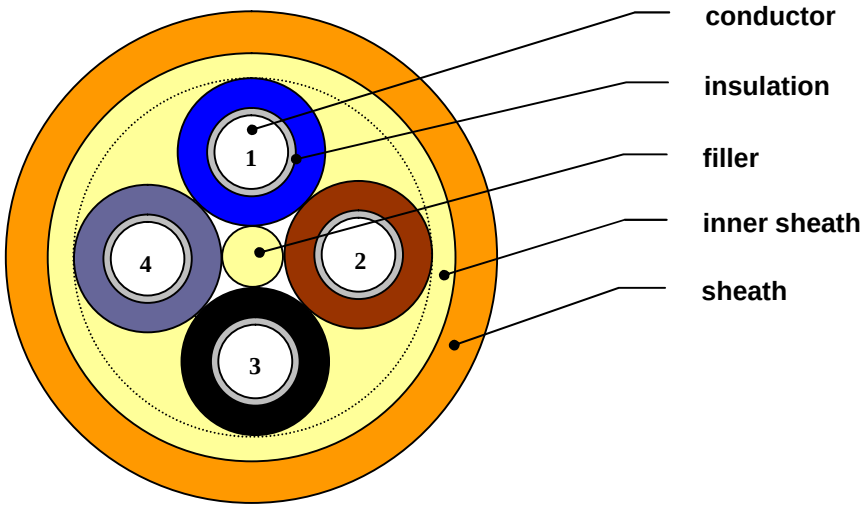
TECHNOKABEL®

CE RoHS

ISO 9001:2008

NHXH FE180 PH30/E30 0,6/1 kV, NHXH-J FE180 PH30/E30 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

NHXH FE180 PH30/E30 0,6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2412/2007**.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228,
insulation	–	mica tape and halogen free cross-linked compound insulation - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

NHXH FE180 PH30/E30 0,6/1 kV, NHXH-J FE180 PH30/E30 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 30 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 61034-2, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-3-24, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	1 x 6 RE	8,1	58	118
	1 x 10 RE	8,9	96	163
	1 x 16 RE	9,8	154	225
	1 x 25 RM	11,8	240	335
	1 x 35 RM	12,8	336	435
	1 x 50 RM	14,2	480	560
	1 x 70 RM	16	672	770
	1 x 95 RM	17,7	912	1020
	1 x 120 RM	19,4	1152	1260
	1 x 150 RM	21,1	1440	1560
	1 x 185 RM	23,2	1776	1950
	1 x 240 RM	25,7	2304	2510
	1 x 300 RM	28,3	2880	3050
	1 x 400 RM	31,6	3840	4140
	2 x 1,5 RE	11,3	29	178
	2 x 2,5 RE	12,1	48	220
	2 x 4 RE	13,1	77	270
	2 x 6 RE	14	115	330
	2 x 10 RE	15,6	192	445
	2 x 16 RE	17,5	307	610
	2 x 25 RM	21,9	480	950
	3 x 1,5 RE	11,8	43	205
	3 x 2,5 RE	12,7	72	255
	3 x 4 RE	13,7	115	315
	3 x 6 RE	14,7	173	395
	3 x 10 RE	16,5	288	550
	3 x 16 RM	18,6	461	775
	3 x 25 RM	23,1	720	1200
	3 x 35 RM	25,3	1008	1540
	3 x 50 RM	28,9	1440	2050
	3 x 70 RM	33,4	2016	2840
	3 x 95 RM	37,4	2736	3800
	3 x120 RM	41,3	3456	4650

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	4 x 1,5 RE	12,6	58	235
	4 x 2,5 RE	13,6	96	295
	4 x 4 RE	14,7	154	375
	4 x 6 RE	15,9	230	475
	4 x 10 RE	17,8	384	670
	4 x 16 RM	20,4	614	965
	4 x 25 RM	25,3	960	1480
	4 x 35 RM	28,3	1344	1960
	4 x 50 RM	32,3	1920	2600
	4 x 70 RM	36,8	2688	3600
	4 x 95 RM	41,3	3648	4750
	5 x 1,5 RE	13,5	72	270
	5 x 2,5 RE	14,7	120	340
	5 x 4 RE	15,9	192	435
	5 x 6 RE	17,2	288	555
	5 x 10 RE	19,6	480	800
	5 x 16 RM	22,2	768	1150
	5 x 25 RM	28,2	1200	1810
	5 x 35 RM	30,9	1680	2340
	5 x 50 RM	35,5	2400	3150
	5 x 70 RM	40,8	3360	4350
	5 x 95 RM	46,8	4560	5900
	7 x 1,5 RE	14,5	101	320
	7 x 2,5 RE	15,7	168	415
	7 x 4,0 RE	17,1	269	540
	12 x 1,5 RE	18,3	173	490
	12 x 2,5 RE	20	288	640
	19 x 1,5 RE	21,2	274	685
	19 x 2,5 RE	23,3	456	905
	24 x 1,5 RE	24,3	346	845
	24 x 2,5 RE	27,2	576	1150
	30 x 1,5 RE	26	432	1010
	30 x 2,5 RE	28,9	720	1370

RE - single wire round conductor;
RM - multiwire round conductor
Other cross-sections and conductor counts available on request.

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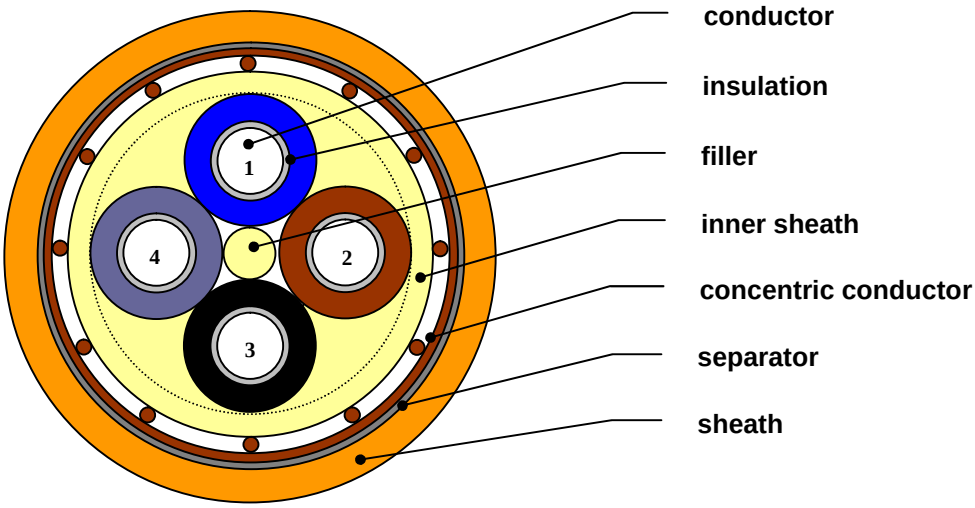
NHXCH FE180 PH30/E30 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

NHXCH FE180 PH30/E30 0,6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2412/2007**.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228,
insulation	–	mica tape and halogen free cross-linked compound insulation - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
concentric conductor	–	concentric conductor made of bare copper wires and a copper tape binder wrapped over the inner sheath,
separator	–	polyester tape,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 – HM4, (oxygen index bigger than 35%).

NHXCH FE180 PH30/E30 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 30 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 61034-2, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	15 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-3-24, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	2 x 1,5 RE/1,5	13,1	52	235
	2 x 2,5 RE/2,5	14,1	80	285
	2 x 4 RE/ 4	15,4	123	355
	2 x 6 RE/ 6	16,3	182	425
	2 x 10 RE/ 10	18,6	312	595
	2 x 16 RE/ 16	20,5	489	795
	2 x 25 RM/ 16	24,5	661	1140
	2 x 35 RM/ 16	26,5	853	1410
	2 x 50 RM/ 25	29,5	1243	1820
	2 x 70 RM/ 35	33,8	1737	2600
	2 x 95 RM/ 50	38,8	2386	3750
	2 x 120 RM/ 70	42,4	3090	4600
	3 x 1,5 RE/ 1,5	13,6	66	265
	3 x 2,5 RE/ 2,5	14,7	104	320
	3 x 4 RE/4	16,0	161	410
	3 x 6 RE/ 6	17,0	240	495
	3 x 10 RE/ 10	19,4	408	710
	3 x 16 RE/ 16	21,5	643	965
	3 x 25 RM/ 16	25,8	902	1390
	3 x 35 RM /16	27,8	1190	1750
	3 x 50 RM/ 25	31,4	1723	2300
	3 x 70 RM/ 35	36,4	2410	3250
	3 x 95 RM/ 50	40,4	3296	4250
	3 x 120 RM/ 70	45,1	4236	5350

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	4 x 1,5 RE/ 1,5	14,4	81	290
	4 x 2,5 RE/ 2,5	15,6	128	370
	4 x 4 RE/ 4	17,0	200	475
	4 x 6 RE/ 6	18,2	297	580
	4 x 10 RE/ 10	20,8	504	845
	4 x 16 RE/ 16	23,1	796	1160
	4 x 25 RM/ 16	27,8	1142	1690
	4 x 35 RM/ 16	30,4	1526	2160
	4 x 50 RM/ 25	34,7	2203	2880
	4 x 70 RM/ 35	39,8	3082	4000
	4 x 95 RM/ 50	44,3	4208	5260
	4 x 120 RM/ 70	50,0	5388	6800
	7 x 1,5 RE/ 2,5	16,3	133	395
	7 x 2,5 RE/ 2,5	17,7	200	500
	12 x 1,5 RE/ 2,5	20,4	205	600
	12 x 2,5 RE/ 4	21,8	334	740
	24 x 1,5 RE/ 6	26,3	413	990
	24 x 2,5 RE/ 10	29,0	696	1300
	30 x 1,5 RE/ 6	27,2	499	1110
	30 x 2,5 RE/ 10	30,4	840	1510

RE - single wire round conductor;
RM - multiwire round conductor
Other cross-sections and conductor counts available on request.

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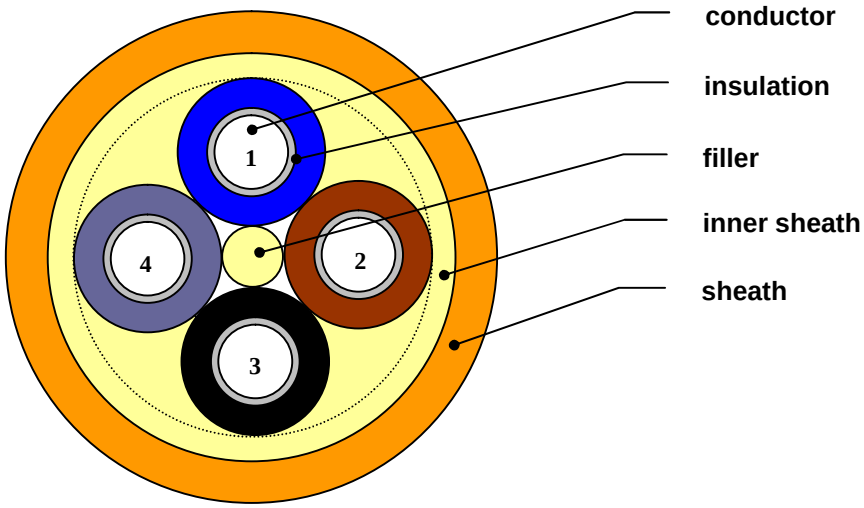
(N)HXH FE180 PH30/E30 0.6/1 kV; (N)HXH-J FE180 PH30/E30 0.6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

(N)HXH FE180 PH30/E30 0.6/1 kV and (N)HXH-J FE180 PH30/E30 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor – bare copper, solid or stranded, according to PN-EN 60228, EN 60228

insulation – double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,

filler – filler made of halogen free compound,

inner sheath – inner sheath made of halogen free compound,

sheath – orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

(N)HXH FE180 PH30/E30 0.6/1 kV; (N)HXH-J FE180 PH30/E30 0.6/1 kV

CHARACTERISTICS

The cables maintain their functions for 30 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius:	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24, PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266; PN-HD 604 S1

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	1 x 16 RE	10	154	238
	1 x 25 RM	12	240	337
	1 x 35 RM	13	336	428
	1 x 50 RM	14	480	551
	1 x 70 RM	16	672	751
	1 x 95 RM	18	912	1049
	1 x 120 RM	19	1152	1299
	1 x 150 RM	21	1440	1617
	1 x 185 RM	23	1776	1950
	1 x 240 RM	27	2304	2597
	2 x 1,5 RE	14	29	252
	2 x 2,5 RE	14	48	299
	2 x 4,0 RE	15	77	356
	2 x 6,0 RE	16	115	423
	2 x 10 RE	18	192	556
	2 x 16 RE	20	307	741
	2 x 25 RM	24	480	879
	3 x 1,5 RE	14	43	299
	3 x 2,5 RE	15	72	337
	3 x 4,0 RE	16	115	413
	3 x 6,0 RE	17	173	499
	3 x 10 RE	19	288	656

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 16 RE	22	461	931
	3 x 25 RM	25	720	1321
				0
	4 x 1,5 RE	15	58	266
	4 x 2,5 RE	16	96	304
	4 x 4,0 RE	17	154	390
	4 x 6,0 RE	18	230	499
	4 x 10 RE	20	384	698
	4 x 16 RM	23	614	1083
	4 x 25 RM	27	960	1539
	4 x 35 RM	29	1344	1948
	4 x 50 RM	32	1920	2607
	5 x 1,5 RE	17	72	309
	5 x 2,5 RE	18	120	385
	5 x 4,0 RE	19	192	485
	5 x 6,0 RE	20	288	618
	5 x 10 RE	22	480	855
	5 x 16 RE	26	768	1292
	5 x 25 RM	30	1200	1900
	5 x 35 RM	32	1680	2423
	5 x 50 RM	37	2400	3381
	7 x 1,5 RE	18	101	356

RE - single wire round conductor;
RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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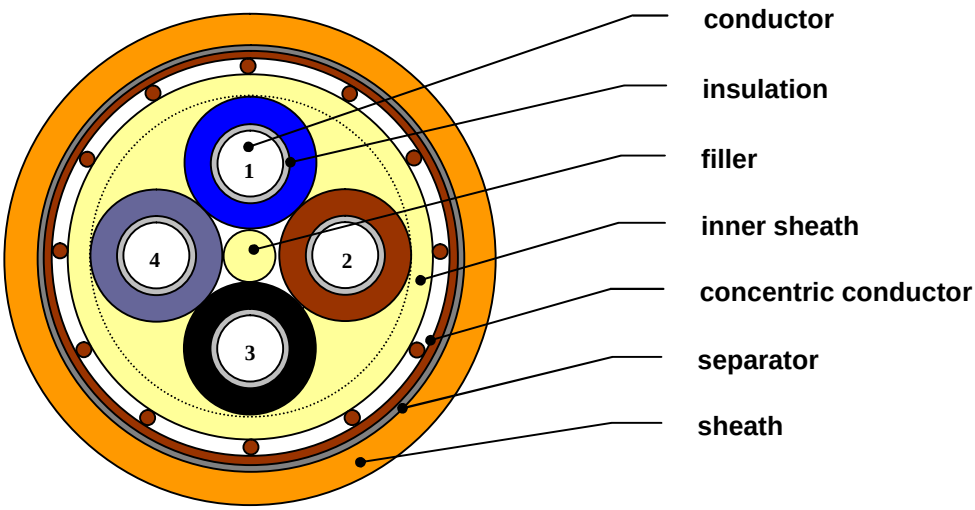
(N)HXCH FE180 PH30/E30 0.6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

(N)HXCH FE180 PH30/E30 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228,
insulation	–	double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
concentric conductor	–	concentric conductor made of bare copper wires and a copper tape binder wrapped over the inner sheath,
separator	–	polyester tape,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 – HM4, (oxygen index bigger than 35%)

(N)HXCH FE180 PH30/E30 0.6/1 kV

CHARACTERISTICS

The cables maintain their functions for 30 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	15 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266; PN-HD 604 S1

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16	66	266
	3 x 2,5 RE/2,5	17	104	352
	3 x 4,0 RE/4,0	18	161	454
	3 x 6,0 RE/6,0	20	240	513
	3 x 10 RE/10	23	408	798
	3 x 16 RE/16	26	643	1159
	3 x 25 RM/16	30	902	1473
	3 x 35 RM/16	33	1190	1862
	3 x 50 RM/25	37	1723	2508
	4 x 1,5RE/1,5	15	81	320
	4 x 2,5 RE/2,5	19	128	475
	4 x 4,0 RE/4,0	20	200	570

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	4 x 6,0 RE/6,0	22	297	732
	4 x 10 RE/10	25	504	1083
	4 x 16 RE/16	26	796	1273
	4 x 25 RM/16	32	1146	1995
	4 x 35 RE/16	35	1528	2480
	4 x 50 RM/25	35	2205	2950
	7 x 1,5RE/2,5	20	133	456
	7 x 2,5 RE/2,5	21	200	561
	12 x 1,5RE/2,5	25	205	698
	12 x 2,5 RE/4,0	27	334	903

RE - single wire round conductor;
RM - multiwire round conductor
Other cross-sections and conductor counts available on request.

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NHXH FE180 PH90/E90 0,6/1 kV, NHXH-J FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES

APPLICATIONS

NHXH FE180 PH90/E90 0.6/1 kV and NHXH-J FE180 PH90/E90 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2412/2007**.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228, **RE** - single wire round conductor; **RM** - multiwire round conductor
insulation	–	mica tape and halogen free cross-linked compound insulation - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

NHXH FE180 PH90/E90 0,6/1 kV, NHXH-J FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 61034-2, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius:	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-24, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

* Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)	Fire load
mm²	mm	kg/km	kg/km	kWh/m
1 x 6 RE	8,5	58	122	0,30
1 x 10 RE	9,3	96	167	0,34
1 x 16 RE	10,2	154	230	0,36
1 x 25 RM	12,2	240	340	0,47
1 x 35 RM	13,2	336	440	0,49
1 x 50 RM	14,5	480	565	0,49
1 x 70 RM	16,4	672	775	0,54
1 x 95 RM	18,1	912	1030	0,56
1 x 120 RM	19,8	1152	1270	0,58
1 x 150 RM	21,5	1440	1570	0,61
1 x 185 RM	23,6	1776	1960	0,82
1 x 240 RM	26,1	2304	2520	0,97
1 x 300 RM	28,7	2880	3100	1,04
1 x 400 RM	32	3840	4170	1,47
2 x 1,5 RE	12	28,8	197	0,79
2 x 2,5 RE	12,8	48	235	0,88
2 x 4 RE	13,7	77	285	0,98
2 x 6 RE	14,7	115	350	1,11
2 x 10 RE	16,3	192	465	1,29
2 x 16 RE	18,3	307	640	1,57
2 x 25 RM	22,5	480	975	2,34
3 x 1,5 RE	12,6	43,2	225	0,86
3 x 2,5 RE	13,4	72	270	0,94
3 x 4 RE	14,4	115	335	1,04
3 x 6 RE	15,5	173	415	1,14
3 x 10 RE	17,2	288	570	1,33
3 x 16 RM	19,3	461	800	1,60
3 x 25 RM	23,8	720	1230	2,41
3 x 35 RM	26,4	1008	1600	2,80
3 x 50 RM	29,4	1440	2070	2,98
3 x 70 RM	34,3	2016	2900	4,18
3 x 95 RM	38,2	2736	3850	5,26
3 x120 RM	42,0	3456	4750	5,66
4 x 1,5 RE	13,5	58	260	0,95

Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)	Fire load
mm²	mm	kg/km	kg/km	kWh/m
4 x 2,5 RE	14,4	96	315	1,03
4 x 4 RE	15,5	154	395	1,14
4 x 6 RE	16,7	230	495	1,25
4 x 10 RE	18,8	384	700	1,49
4 x 16 RM	21,2	614	990	1,78
4 x 25 RM	26,5	960	1540	2,74
4 x 35 RM	29,1	1344	1990	3,05
4 x 50 RM	32,8	1920	2620	3,31
4 x 70 RM	37,8	2688	3650	4,55
4 x 95 RM	42,1	3648	4800	5,44
5 x 1,5 RE	14,5	72	295	1,05
5 x 2,5 RE	15,5	120	360	1,33
5 x 4 RE	16,8	192	460	1,27
5 x 6 RE	18,3	288	590	1,43
5 x 10 RE	20,7	480	835	1,68
5 x 16 RM	23,1	768	1180	1,95
5 x 25 RM	29,1	1200	1840	3,02
5 x 35 RM	32,4	1680	2430	3,54
5 x 50 RM	36,1	2400	3200	3,78
5 x 70 RM	41,7	3360	4400	4,92
5 x 95 RM	47,7	4560	5950	6,57
7 x 1,5 RE	15,6	101	350	1,18
7 x 2,5 RE	16,7	168	440	1,29
7 x 4,0 RE	18,3	269	580	1,45
12 x 1,5 RE	19,8	173	535	1,71
12 x 2,5 RE	21,6	288	690	1,90
14 x 1,5 RE	20,9	202	655	1,79
19 x 1,5 RE	23,0	274	740	2,20
19 x 2,5 RE	24,9	456	960	2,38
24 x 1,5 RE	26,9	346	945	2,83
24 x 2,5 RE	29,4	576	1230	3,09
30 x 1,5 RE	28,6	432	1110	3,20
30 x 2,5 RE	31,2	720	1460	3,50

Other cross-sections and conductor counts available on request.

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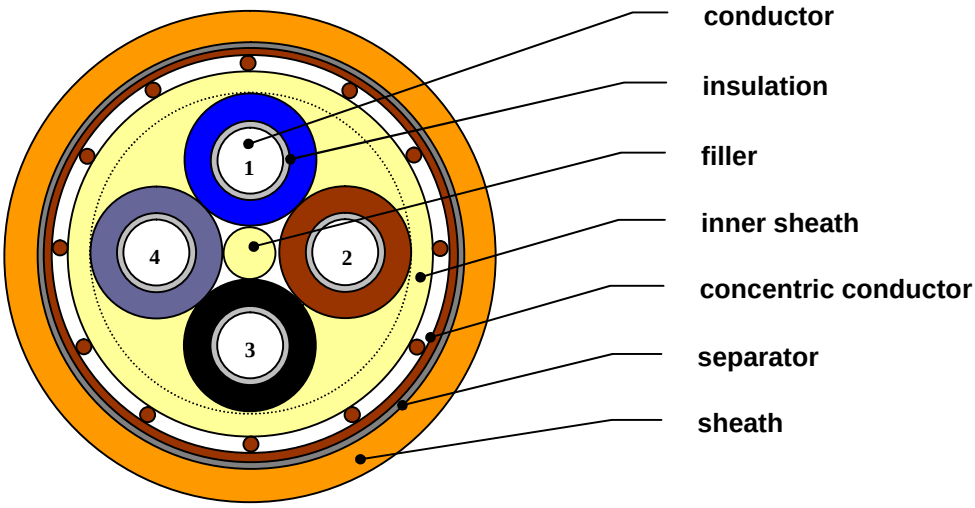
NHXCH FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

NHXCH FE180 PH90/E90 0,6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2412/2007**.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded according to PN-EN 60228, EN 60228,
insulation	–	mica tape and halogen free cross-linked compound insulation - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
concentric conductor	–	concentric conductor made of bare copper wires and a copper tape binder wrapped over the inner sheath,
separator	–	polyester tape,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 – HM4, (oxygen index bigger than 35%).

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NHXCH FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 61034-2, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	15 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-3-24, IEC 60332-3-24, PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Numer wyrobu	Liczba żył x przekrój żył	Średnica zewnętrzna (około)	Indeks miedziowy	Masa kabla (około)
	mm²	mm	kg/km	kg/km
	2 x 1,5 RE/1,5	13,7	52	255
	2 x 2,5 RE/2,5	14,7	80	300
	2 x 4 RE/ 4	16,0	123	375
	2 x 6 RE/ 6	17,0	182	440
	2 x 10 RE/ 10	19,2	312	620
	2 x 16 RE/ 16	21,2	489	820
	2 x 25 RM/ 16	25,0	661	1160
	2 x 35 RM/ 16	27,0	853	1430
	2 x 50 RM/ 25	30,0	1243	1840
	2 x 70 RM/ 35	35,1	1737	2730
	2 x 95 RM/ 50	39,5	2386	3800
	2 x 120 RM/ 70	43,1	3090	4700
	3 x 1,5 RE/ 1,5	14,3	66	280
	3 x 2,5 RE/ 2,5	15,3	104	340
	3 x 4 RE/4	16,7	161	425
	3 x 6 RE/ 6	17,8	240	515
	3 x 10 RE/ 10	20,1	408	730
	3 x 16 RE/ 16	22,2	643	985
	3 x 25 RM/ 16	26,4	902	1420
	3 x 35 RM /16	28,7	1190	1790
	3 x 50 RM/ 25	31,9	1723	2310
	3 x 70 RM/ 35	37,3	2410	3300
	3 x 95 RM/ 50	39,5	3296	4550
	3 x 120 RM/ 70	45,8	4236	5450

Numer wyrobu	Liczba żył x przekrój żył	Średnica zewnętrzna (około)	Indeks miedziowy	Masa kabla (około)
	mm²	mm	kg/km	kg/km
	4 x 1,5 RE/ 1,5	15,2	81	320
	4 x 2,5 RE/ 2,5	16,4	128	390
	4 x 4 RE/ 4	17,8	200	495
	4 x 6 RE/ 6	19,0	297	625
	4 x 10 RE/ 10	21,6	504	890
	4 x 16 RE/ 16	23,9	796	1190
	4 x 25 RM/ 16	28,8	1142	1740
	4 x 35 RM/ 16	31,4	1526	2220
	4 x 50 RM/ 25	35,3	2203	2920
	4 x 70 RM/ 35	40,8	3082	4100
	4 x 95 RM/ 50	45,9	4208	5650
	4 x 120 RM/ 70	50,8	5388	6900
	7 x 1,5 RE/ 2,5	17,3	133	420
	7 x 2,5 RE/ 2,5	18,6	200	520
	12 x 1,5 RE/ 2,5	21,4	205	640
	12 x 2,5 RE/ 4	23,4	334	800
	24 x 1,5 RE/ 6	28,3	413	1080
	24 x 2,5 RE/ 10	30,9	696	1410
	30 x 1,5 RE/ 6	29,7	499	1250
	30 x 2,5 RE/ 10	32,7	840	1650

RE - single wire round conductor;
RM - multiwire round conductor
Other cross-sections and conductor counts available on request.

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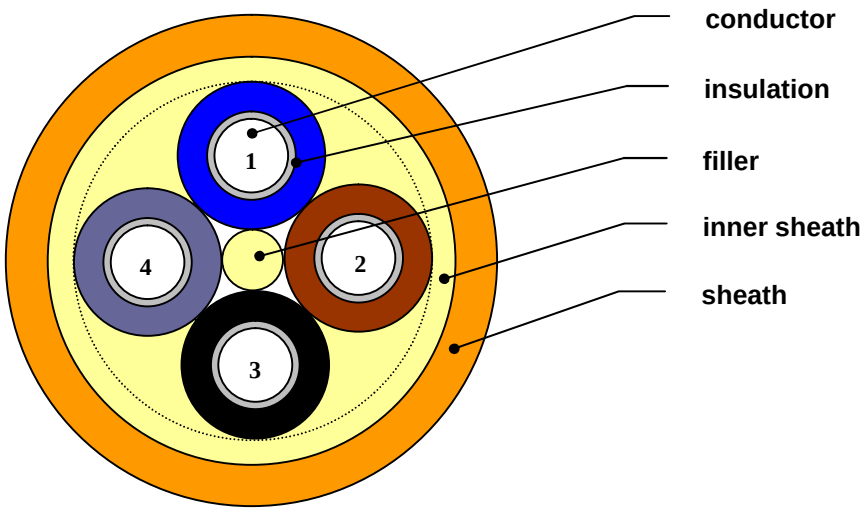
(N)HXH FE180 PH90/E90 0,6/1 kV; (N)HXH-J FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

(N)HXH FE180 PH90/E90 0.6/1 kV and (N)HXH-J FE180 PH90/E90 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228,
insulation	–	double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

(N)HXH FE180 PH90/E90 0,6/1 kV; (N)HXH-J FE180 PH90/E90 0,6/1 kV____

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius:	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	1 x 16 RE	10	154	250
	1 x 25 RM	12	240	355
	1 x 35 RM	13	336	450
	1 x 50 RM	14	480	580
	1 x 70 RM	16	672	790
	1 x 95 RM	18	912	1070
	1 x 120 RM	19	1152	1325
	1 x 150 RM	21	1440	1650
	1 x 185 RM	23	1776	1990
	1 x 240 RM	27	2304	2650
	2 x 1,5 RE	14	29	265
	2 x 2,5 RE	14	48	315
	2 x 4,0 RE	15	77	375
	2 x 6,0 RE	16	115	445
	2 x 10 RE	18	192	585
	2 x 16 RE	20	307	780
	2 x 25 RM	24	480	925
	3 x 1,5 RE	14	43	315
	3 x 2,5 RE	15	72	355
	3 x 4,0 RE	16	115	435
	3 x 6,0 RE	17	173	525
	3 x 10 RE	19	288	690

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 16 RE	22	461	980
	3 x 25 RM	25	720	1390
	4 x 1,5 RE	14	58	270
	4 x 2,5 RE	16	96	320
	4 x 4,0 RE	17	154	410
	4 x 6,0 RE	18	230	525
	4 x 10 RE	20	384	735
	4 x 16 RM	23	614	1140
	4 x 25 RM	27	960	1620
	4 x 35 RM	29	1344	2050
	4 x 50 RM	32	1920	2660
	5 x 1,5 RE	17	72	325
	5 x 2,5 RE	18	120	405
	5 x 4,0 RE	19	192	510
	5 x 6,0 RE	20	288	650
	5 x 10 RE	22	480	900
	5 x 16 RE	26	768	1360
	5 x 25 RM	30	1200	2000
	5 x 35 RM	32	1680	2550
	5 x 50 RM	37	2400	3450
	7 x 1,5 RE	18	101	375

RE - single wire round conductor;
RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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HDGs(żo) FE180 PH90/E30-E90, HDGsekw(żo) FE180 PH90/E30-E90
HLGs(żo) FE180 PH90/E30-E90, HLGsekw(żo) FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE POWER CABLES

APPLICATIONS

HDGs(żo) FE180 PH90/E30-E90 300/500 V, HLGs(żo) FE180 PH90/E30-E90 300/500 V fire resistant cables and **HDGsekw(żo) FE180 PH90/E30-E90 300/500 V, HLGsekw(żo) FE180 PH90/E30-E90 300/500 V** screened fire resistant cables, are intended for power supply to fire protection equipment which is to operate in fire conditions. The cables are suitable for installation in alarm, signalling, transmission, sound warning and similar systems.

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2698/2009**.

An overall electrostatic shield **(ekw)** in screened cables protects cable circuits against interference by external electric fields.

CONSTRUCTION

– bare copper, single wire **(D)** or stranded multi wire **(L)**, round conductors meeting requirements of class 1 or 5 per PN-EN 60228,

– special silicone rubber insulation,

– identification colour code according to PN-HD 308 S2,

– insulated conductors laid-up in layers,

– cable core wrapped in polyester tape - in **HDGsekw** and **HLGsekw**,

– overall electrostatic shield incorporating aluminium-polyester tape and stranded annealed tinned copper drain wire - in **HDGsekw** and **HLGsekw**,

–red cable sheath of halogen free compound.

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HDGs(żo) FE180 PH90/E30-E90, HDGsekw(żo) FE180 PH90/E30-E90
HLGs(żo) FE180 PH90/E30-E90, HLGsekw(żo) FE180 PH90/E30-E90

CHARACTERISTICS

Conductor diameter	mm	**1,0**	**1,1**	**1,4**	**1,8**	**2,3**	**2,8**
Conductor cross-section	mm^2	**0,75**	**1**	**1,5**	**2,5**	**4**	**6**
DC conductor resistance at 20°C, maximum	Ω/km	26,0	19,5	13,3	7,98	4,95	3,30
Capacitance between conductors at 1 kHz, – maximum	nF/km	120	120	120	120	120	120
– average		70	70	80	80	100	100

Operating voltage U_o/U	300/500 V
Voltage test	2 kVrms
Insulation resistivity at 20°C, minimum	100 MΩ·km
Inductance, approximate	0,7 mH/km
Conductor temperature limit	
in work conditions	+ 85°C
in short-circuit (max 5 s)	+ 250°C
Operating temperature range	
during operation	from - 25 to + 85°C
during installation	from -10 to + 50°C
Minimum bending radius	
HDGs(ekw) cables	10 x cable diameter
HLGs(ekw)cables	6 x cable diameter

Corrosivity of emitted gases	very low, halogen free PN-EN 50267-2-3, IEC 60754-2
pH, aprox.	6,8
conductivity, aprox.	0,4 µS/cm
Smoke density per	low smoke density PN-EN 50268-2-3, IEC 61034-2
light transmittance, minimum	94 %
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2, IEC 60332-1, PN-EN 60332-3-22, IEC 60332-3-22 (cat.A)
Circuit integrity*	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	AT-603-0248/2009 and WT-TK-46

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Cable type	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
HDGs	2 x 0,75	6,4	14,4	50
HDGs	2 x 1	6,6	19,2	55
HDGs	2 x 1,5	7,5	28,8	75
HDGs	2 x 2,5	8,9	48	105
HDGs	2 x 4	9,8	77	140
HDGs	2 x 6	11,6	115	200
HDGs	3 x 0,75	7,1	21,6	68
HDGs	3 x 1	7,2	28,8	70
HDGs	3 x 1,5	8,2	43,2	95
HDGs	3 x 2,5	9,7	72	140
HDGs	3 x 4	10,9	115	200
HDGs	3 x 6	12,8	173	280
HDGs	4 x 0,75	6,4	28,8	60
HDGs	4 x 1	7,6	38,4	90

Cable type	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
HDGs	4 x 1,5	8,9	58	125
HDGs	4 x 2,5	10,4	96	185
HDGs	4 x 4	11,5	154	250
HDGs	4 x 6	13,7	230	360
HDGs	5 x 0,75	6,5	36	68
HDGs	5 x 1	8,5	48	110
HDGs	5 x 1,5	9,9	72	155
HDGs	5 x 2,5	11,4	120	220
HDGs	5 x 4	12,6	192	305
HDGs	5 x 6	15,1	288	450
HLGs	2 x 1	6,8	19,2	55
HLGsekw	2 x 1	7,0	19,2	65
HDGsekw	2 x 1	6,8	19,2	55

Other cross-sections and conductor counts available on request.

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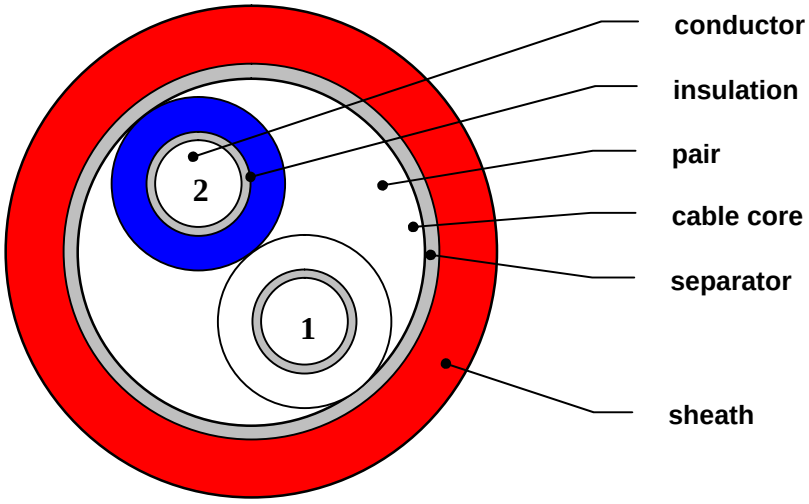
HTKSH FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

HTKSH FE180 PH90/E30-E90 fire resistant and halogen free cables are intended for installation in alarm, signalling, transmission, sound warning and similar systems, also for data processing systems and for analogue or digital data transmission in industrial electronics and control applications in objects of sharp fire protection requirements, particularly in fire alarm and fire automatic control systems.

Halogen free cables are applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – data are transmitted and power is supplied to equipment which must operate in fire conditions and during fire fighting (e.g. emergency lighting). The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are suitable for indoor installations.

CONSTRUCTION

conductor	–	bare copper, solid,
insulation	–	mica tape and halogen free compound insulation - colours in accordance with PN-92/T-90321 standard,
pair	–	insulated conductors twisted into pairs,
cable core	–	pairs laid-up into a cable core,
separator	–	polyester tape,
sheath	–	red, cable sheath made of halogen free compound according to EN 50290-2-27 and VDE 0250-214 – HM2, (oxygen index bigger than 35%).

HTKSH FE180 PH90/E30-E90

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor diameter		mm	0.8	1.0	1.4	1.8	2.3	2.8
Conductor cross-section		mm^2	0.5	0.75	1.5	2.5	4	6
DC loop resistance at 20°C, maximum		Ω/km	75	48	24.5	14.9	9.3	6.3
Capacitance between conductors at 1 kHz	maximum	nF/km	120	120	120	120	120	120
	average		60	70	70	70	100	100

Operating voltage	240 V
Voltage test	1.5 kV rms
Insulation resistance, minimum	100 MΩ·km
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 61034-2, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 50°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	WT-TK-43 PN-92/T-90320 PN-92/T-90321

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
HTKSH FE180 PH90/E30-E90	1 x 2 x 0.8	6.5	10	61

Other diameters and conductor counts available on request.

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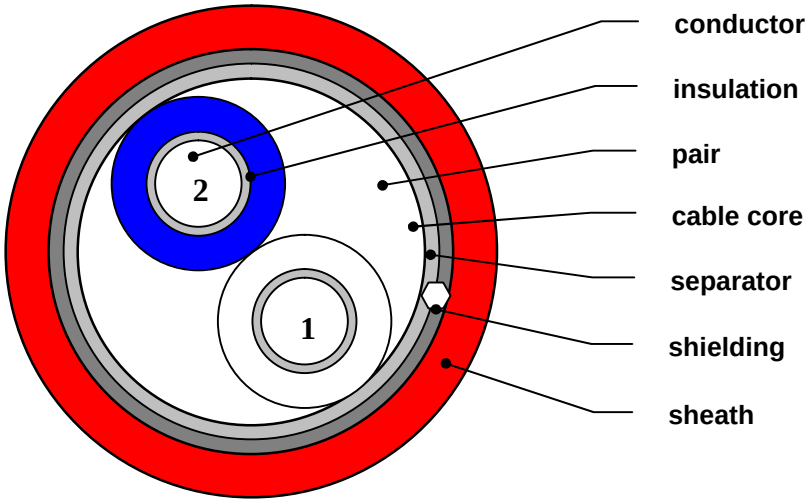
TECHNOKABEL®

CE RoHS

ISO 9001:2008

HTKSHekw FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

HTKSHekw FE180 PH90/E30-E90 fire resistant and halogen free cables are intended for installation in alarm, signalling, transmission, sound warning and similar systems, also for data processing systems and for analogue or digital data transmission in industrial electronics and control applications in objects of sharp fire protection requirements, particularly in fire alarm and fire automatic control systems.

Halogen free cables are applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – data are transmitted and power is supplied to equipment which must operate in fire conditions and during fire fighting (e.g. emergency lighting). The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

Cable circuits are protected by an overall electrostatic shield against external electric field interferences.

The cables are suitable for indoor installations.

CONSTRUCTION

conductor	–	bare copper, solid,
insulation	–	mica tape and halogen free compound insulation - colours in accordance with PN-92/T-90321 standard,
pair	–	insulated conductors twisted into pairs,
cable core	–	pairs laid-up into a cable core,
separator	–	polyester tape,
shielding	–	overall electrostatic shield incorporating a plastic laminated metal foil and a tinned copper drain wire Ø 0.8 mm,
sheath	–	red, cable sheath made of halogen free compound according to EN 50290-2-27 and VDE 0250-214 – HM2, (oxygen index bigger than 35%).

HTKSHekw FE180 PH90/E30-E90

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor diameter		mm	0.8	1.0	1.4	1.8	2.3	2.8
Conductor cross-section		mm^2	0.5	0.75	1.5	2.5	4	6
DC loop resistance at 20°C, maximum		Ω/km	75	48	24.5	14.9	9.3	6.3
Capacitance between conductors at 1 kHz	maximum	nF/km	200	200	200	200	200	200
	average		90	130	130	130	150	150

Operating voltage	240 V
Voltage test	1.5 kV rms
Insulation resistance, minimum	100 MΩ·km
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 61034-2, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 50°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	WT-TK-43 PN-92/T-90320 PN-92/T-90321

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
HTKSHekw FE180 PH90/E30-E90	1 x 2 x 0.8	7.4	15	66

Other diameters and conductor counts available on request.

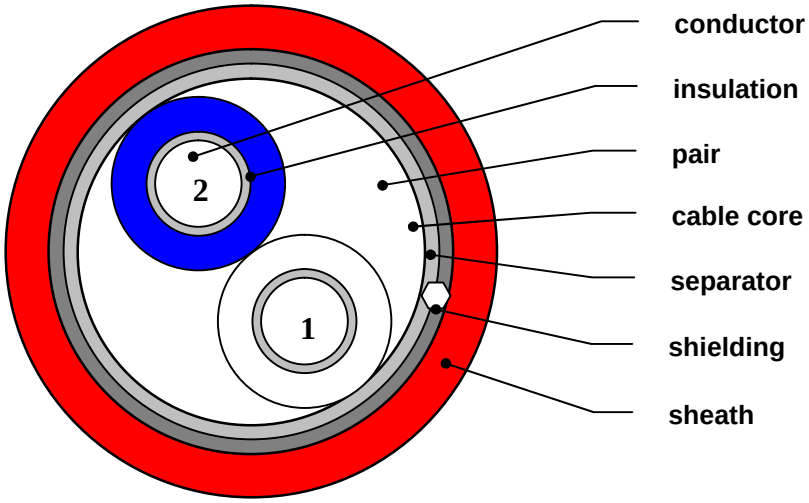
TECHNOKABEL®

CE RoHS

ISO 9001:2008

JE-H(St)H...Bd FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

JE-H(St)H…Bd FE180 PH90/E30-E90 fire resistant and halogen free cables are intended for installation in alarm, signalling, transmission, sound warning and similar systems, also for data processing systems and for analogue or digital data transmission in industrial electronics and control applications in objects of sharp fire protection requirements, particularly in fire alarm and fire automatic control systems.

Halogen free cables are applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

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The cables are suitable for indoor installations.

CONSTRUCTION

conductor	–	bare copper, solid,
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cable core	–	pairs laid-up into a cable core,
separator	–	polyester tape,
shielding	–	overall electrostatic shield incorporating a plastic laminated metal foil and a tinned copper drain wire,
sheath	–	red, cable sheath made of halogen free compound according to EN 50290-2-27 and VDE 0250-214 – HM2, (oxygen index bigger than 35%).

JE-H(St)H...Bd FE180 PH90/E30-E90

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor diameter		mm	0.8	1.0	1.4	1.8	2.3	2.8
Conductor cross-section		mm^2	0.5	0.75	1.5	2.5	4	6
DC loop resistance at 20°C, maximum		Ω/km	75	48	24.5	14.9	9.3	6.3
Capacitance between conductors at 1 kHz	maximum	nF/km	200	200	200	200	200	200
	average		90	130	130	130	150	150

Operating voltage	240 V
Voltage test	1.5 kV rms
Insulation resistance, minimum	100 MΩ·km
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 50°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	VDE 0815

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
JE-H(St)H FE180 PH90/E30-E90	1 x 2 x 0,8 Bd	7.4	15	66

Other diameters and conductor counts available on request.

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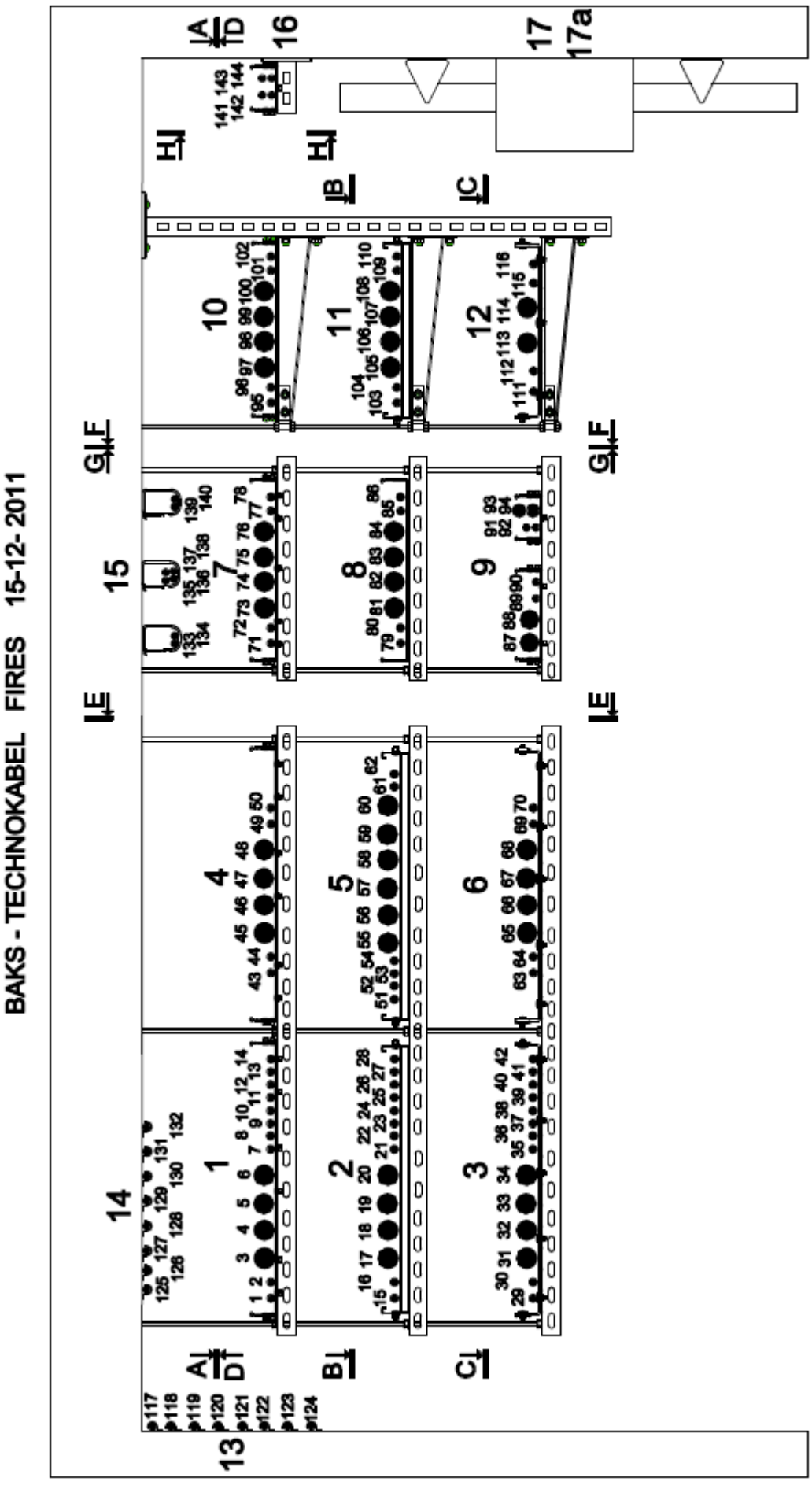
BAKS – TECHNOKABEL BADANIE FIRES 15. 12. 2011

Nr	Nr FIRES	Czas	Symbol kabla	Pozycja	Konstrukcja mocowania, odległość, obciążenie
1	49		NHXH-J FE180 PH30/E30 4x1.5 RE	1	Korytko kablowe KCOP 600H60/... L, B-600, 1.5 m /15kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L do betonu za pomocą tulejek rozporowych TRSO M10x40
2			NHXH-J FE180 PH30/E30 4x1.5 RE		
3	48		NHXH-J FE180 PH30/E30 4x50 RM		
4			NHXH-J FE180 PH30/E30 4x50 RM		
5	47		NHXH-J FE180 PH90/E90 4x50 RM		
6			NHXH-J FE180 PH90/E90 4x50 RM		
7	46		NHXH-J FE180 PH90/E90 4x1.5 RE		
8			NHXH-J FE180 PH90/E90 4x1.5 RE		
9	66A		HTKSH FE180 PH90/E90 1x2x0,8 mm		
10	66B		HTKSH FE180 PH90/E90 1x2x0,8 mm		
11	65A		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
12	65B		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
13	64A		HDGs FE180 PH90/E30-E90 2x1 mm^2		
14	64B		HDGs FE180 PH90/E30-E90 2x1 mm^2		
15	45		NHXH-J FE180 PH30/E30 4x1.5 RE	2	Drabinka kablowa DUOP 600H60/... L, B-600, 1.5 m /20kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L do betonu za pomocą tulejek rozporowych TRSO M10x40
16			NHXH-J FE180 PH30/E30 4x1.5 RE		
17	44		NHXH-J FE180 PH30/E30 4x50 RM		
18			NHXH-J FE180 PH30/E30 4x50 RM		
19	43		NHXH-J FE180 PH90/E90 4x50 RM		
20			NHXH-J FE180 PH90/E90 4x50 RM		
21	42		NHXH-J FE180 PH90/E90 4x1.5 RE		
22			NHXH-J FE180 PH90/E90 4x1.5 RE		
23	63A		HTKSH FE180 PH90/E90 1x2x0,8 mm		
24	63B		HTKSH FE180 PH90/E90 1x2x0,8 mm		
25	62A		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
26	62B		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
27	61A		HDGs FE180 PH90/E30-E90 2x1 mm^2		
28	61B		HDGs FE180 PH90/E30-E90 2x1 mm^2		
29	41		NHXH-J FE180 PH30/E30 4x1.5 RE	3	Korytko siatkowe KDSO 600H60/...L, B-600, 1.5 m /20kg/m / gruboś pręta 4,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L do betonu za pomocą tulejek rozporowych TRSO M10x40
30			NHXH-J FE180 PH30/E30 4x1.5 RE		
31	40		NHXH-J FE180 PH30/E30 4x50 RM		
32			NHXH-J FE180 PH30/E30 4x50 RM		
33	39		NHXH-J FE180 PH90/E90 4x50 RM		
34			NHXH-J FE180 PH90/E90 4x50 RM		
35	38		NHXH-J FE180 PH90/E90 4x1.5 RE		
36			NHXH-J FE180 PH90/E90 4x1.5 RE		
37	60A		HTKSH FE180 PH90/E90 1x2x0,8 mm		
38	60B		HTKSH FE180 PH90/E90 1x2x0,8 mm		
39	59A		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
40	59B		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
41	58A		HDGs FE180 PH90/E30-E90 2x1 mm^2		
42	58B		HDGs FE180 PH90/E30-E90 2x1 mm^2		
43	37		(N)HXH-J FE180 PH30/E30 4x1.5 RE	4	Korytko kablowe KCOP 600H60/... L, B-600, 1.5 m /15kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L do betonu za pomocą tulejek rozporowych TRSO M10x40
44			(N)HXH-J FE180 PH30/E30 4x1.5 RE		
45	36		(N)HXH-J FE180 PH30/E30 4x50 RM		
46			(N)HXH-J FE180 PH30/E30 4x50 RM		
47	35		(N)HXH-J FE180 PH90/E90 4x50 RM		
48			(N)HXH-J FE180 PH90/E90 4x50 RM		
49	34		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
50			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
51	33		(N)HXH-J FE180 PH30/E30 4x1.5 RE	5	Drabinka kablowa DUOP 600H60/... L, B-600, 1.5 m /20kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L do betonu za pomocą tulejek rozporowych TRSO M10x40
52			(N)HXH-J FE180 PH30/E30 4x1.5 RE		
53	32		(N)HXCH FE180 PH30/E30 4x1.5/1.5 RE		
54			(N)HXCH FE180 PH30/E30 4x1.5/1.5 RE		
55	31		(N)HXCH FE180 PH30/E30 4x50/25 RM		
56			(N)HXCH FE180 PH30/E30 4x50/25 RM		
57	30		(N)HXH-J FE180 PH30/E30 4x50 RM		
58			(N)HXH-J FE180 PH30/E30 4x50 RM		
59	29		(N)HXH-J FE180 PH90/E90 4x50 RM		
60			(N)HXH-J FE180 PH90/E90 4x50 RM		
61	28		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
62			(N)HXH-J FE180 PH90/E90 4x1.5 RE		

Nr	Nr FIRES	Czas	Symbol kabla	Pozycja	Konstrukcja mocowania, odległość, obciążenie
63	27		(N)HXH-J FE180 PH30/E30 4x1.5 RE	6	Korytko siatkowe KDSO 600H60/...L, B-600, 1.5 m /20kg/m / grubość pręta 4,5 mm Mocowani : na ceowniku CWOP 40H40/ …L do betonu za pomocą tulejek rozporowych TRSO M10x40
64			(N)HXH-J FE180 PH30/E30 4x1.5 RE		
65	26		(N)HXH-J FE180 PH30/E30 4x50 RM		
66			(N)HXH-J FE180 PH30/E30 4x50 RM		
67	25		(N)HXH-J FE180 PH90/E90 4x50 RM		
68			(N)HXH-J FE180 PH90/E90 4x50 RM		
69	24		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
70			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
71	22		NHXH-J FE180 PH30/E30 4x1.5 RE	7	Korytko kablowe KSOJ 400H60/..., B-400, 1.5 m /15kg/m / grubość blachy 0,9 mm Mocowanie : na ceowniku CWOP 40H40/ … prętach gwintowanych PGM10/1 do betonu za pomocą tulejek rozporowych TRSO M10x 40
72			NHXH-J FE180 PH30/E30 4x1.5 RE		
73	21		NHXH-J FE180 PH30/E30 4x50 RM		
74			NHXH-J FE180 PH30/E30 4x50 RM		
75	20		NHXH-J FE180 PH90/E90 4x50 RM		
76			NHXH-J FE180 PH90/E90 4x50 RM		
77	19		NHXH-J FE180 PH90/E90 4x1.5 RE		
78			NHXH-J FE180 PH90/E90 4x1.5 RE		
79	18		NHXCH FE180 PH30/E30 4x1.5/1.5 RE	8	Korytko kablowe KGOJ 400H60/..., B-400, 1.5 m /15kg/m / grubość blachy 0,9 mm Mocowanie : na ceowniku CWOP 40H40/ … prętach gwintowanych PGM10/1 do betonu za pomocą tulejek rozporowych TRSO M10x40
80			NHXCH FE180 PH30/E30 4x1.5/1.5 RE		
81	17		NHXCH FE180 PH30/E30 4x50/25 RM		
82			NHXCH FE180 PH30/E30 4x50/25 RM		
83	16		NHXCH FE180 PH90/E90 4x50/25 RM		
84			NHXCH FE180 PH90/E90 4x50/25 RM		
85	15		NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
86			NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
87	14		NHXH-J FE180 PH90/E90 4x50 RM	9	Korytko kablowe KGOL 200H60/..., B-200, 1.5 m /15kg/m / grubość blachy 0,7 mm Mocowanie : na ceowniku CWOP 40H40/ … prętach gwintowanych PGM10/1 do betonu za pomocą tulejek rozporowych TRSO M10x40
88			NHXH-J FE180 PH90/E90 4x50 RM		
89	13		NHXH-J FE180 PH90/E90 4x1.5 RE		
90			NHXH-J FE180 PH90/E90 4x1.5 RE		
91	12		NHXH-J FE180 PH90/E90 4x50 RM	9a	Korytko kablowe KGOL 100H60/..., B-100, 1.5 m /15kg/m / grubość blachy 0,7 mm Mocowanie : na ceowniku CWOP 40H40/ … prętach gwintowanych PGM10/1 do betonu za pomocą tulejek rozporowych TRSO M10x40
92			NHXH-J FE180 PH90/E90 4x50 RM		
93	11		NHXH-J FE180 PH90/E90 4x1.5 RE		
94			NHXH-J FE180 PH90/E90 4x1.5 RE		
95	10		NHXCH FE180 PH90/E90 4x1.5/1.5 RE	10	Korytko kablowe KCOP 400H60/..., B-400, 1.5 m /15kg/m / grubość blachy 1,5 mm Mocowanie : na wsporniku WPCO 1000, wysięgnik WMCO 400, pręt gwintowany M10 do betonu za pomocą tulejek rozporowych TRSO M10x40 i kołków rozporowych PSRO M10x80
96			NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
97	9		NHXCH FE180 PH90/E90 4x50/25 RM		
98			NHXCH FE180 PH90/E90 4x50/25 RM		
99	8		(N)HXH-J FE180 PH90/E90 4x50 RM		
100			(N)HXH-J FE180 PH90/E90 4x50 RM		
101	7		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
102			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
103	6		NHXCH FE180 PH30/E30 4x1.5/1.5 RE	11	Drabinka kablowa DGOP 400H60/..., B-400, 1.5 m /20kg/m / grubość blachy 1,5 mm Mocowanie : na wsporniku WPCO 1000, wysięgnik WMCO 400, pręt gwintowany M10 do betonu za pomocą tulejek rozporowych TRSO M10x40 i kołków rozporowych PSRO M10x80
104			NHXCH FE180 PH30/E30 4x1.5/1.5 RE		
105	5		NHXCH FE180 PH30/E30 4x50/25 RM		
106			NHXCH FE180 PH30/E30 4x50/25 RM		
107	4		(N)HXH-J FE180 PH90/E90 4x50 RM		
108			(N)HXH-J FE180 PH90/E90 4x50 RM		
109	3		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
110			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
111	2		(N)HXCH FE180 PH30/E30 4x1.5/1.5 RE	12	Korytko siatkowe KDSO 400H60/…, B-400, 1.5 m /20kg/m / grubość pręta 4,5 mm, Mocowanie : na wsporniku WPCO 1000, wysięgnik WMCO 400, pręt gwintowany M10 do betonu za pomocą tulejek rozporowych TRSO M10x40 i kołków rozporowych PSRO M10x80
112			(N)HXCH FE180 PH30/E30 4x1.5/1.5 RE		
113	1		(N)HXCH FE180 PH30/E30 4x50/25 RM		
114			(N)HXCH FE180 PH30/E30 4x50/25 RM		
115	54A		JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
116	54B		JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
117	72A		HTKSH FE180 PH90/E90 1x2x0,8 mm	13	Uchwyty UDF wraz z kablami ułożone pod tynkiem gipsowym - mocowanie co 300 mm
118	72B		HTKSH FE180 PH90/E90 1x2x0,8 mm		
119	71A		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
120	71B		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
121	70A		HDGs FE180 PH90/E30-E90 2x1 mm^2		
122	70B		HDGs FE180 PH90/E30-E90 2x1 mm^2		
123	51		NHXH-J FE180 PH90/E90 4x1.5 RE		
124			NHXH-J FE180 PH90/E90 4x1.5 RE		

Nr	Nr FIRES	Czas	Symbol kabla	Pozycja	Konstrukcja mocowania, odległość, obciążenie
125	**69A**		HTKSH FE180 PH90/E90 1x2x0,8 mm	**14**	Uchwyty UDF - malowanie farbą akrylową- mocowanie co 600 mm
126	**69B**		HTKSH FE180 PH90/E90 1x2x0,8 mm		
127	**68A**		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
128	**68B**		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
129	**67A**		HDGs FE180 PH90/E30-E90 2x1 mm^2		
130	**67B**		HDGs FE180 PH90/E30-E90 2x1 mm^2		
131	**50**		NHXH-J FE180 PH90/E90 4x1.5 RE		
132			NHXH-J FE180 PH90/E90 4x1.5 RE		
133	**57A**		HDGs FE180 PH90/E30-E90 2x1 mm^2	**15**	Obejma OZSO - mocowanie do betonu co 600 mm za pomocą stalowego kołka rozporowego SRO M6x30
134	**57B**		HDGs FE180 PH90/E30-E90 2x1 mm^2		
135	**56A**		HTKSH FE180 PH90/E90 1x2x0,8 mm		
136	**56B**		HTKSH FE180 PH90/E90 1x2x0,8 mm		
137	**55A**		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
138	**55B**		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
139	**23**		NHXH-J FE180 PH90/E90 4x1.5 RE		
140			NHXH-J FE180 PH90/E90 4x1.5 RE		
141	**52A**		JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	**16**	Korytko kablowe KCOP 100H60/..., B-100, 1.5 m /10kg/m / grubość blachy 1,5 mm Mocowanie : wysięgnik WPTO 100 bez podpórki do betonu za pomocą kołków rozporowych PSRO M10x80
142	**52B**		JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
143	**53A**		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
144	**53B**		HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
145			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	**17**	Puszka osłonowa do kabli o wysokości 200 mm Obudowa drabiny kablowej DGOP 400H60 płytą Promat o grubości 30 mm oraz wypełnienie wełną mineralną o gęstości 120. Mocowanie do ściany betonowej za pomocą prętów stalowych PG M6 Kable zamocowane za pomocą uchwytów UKO 1 i obciążone masą równą wadze kabla o długości 3,5 m.
146			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
147			(N)HXH-J FE180 PH90/E90 4x50 RM		
148			(N)HXH-J FE180 PH90/E90 4x50 RM		
149			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
150			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
151			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
152			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
153			(N)HXH-J FE180 PH90/E90 4x50 RM		
154			(N)HXH-J FE180 PH90/E90 4x50 RM		
155			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
156			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
157			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	**17a**	Puszka osłonowa do kabli o wysokości 300 mm Obudowa drabiny kablowej DGOP 400H60 płytą Promat o grubości 30 mm oraz wypełnienie wełną mineralną o gęstości 120. Mocowanie do ściany betonowej za pomocą prętów stalowych PG M6 Kable zamocowane za pomocą uchwytów UKO 1 i obciążone masą równą wadze kabla o długości 3,5 m.
158			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
159			(N)HXH-J FE180 PH90/E90 4x50 RM		
160			(N)HXH-J FE180 PH90/E90 4x50 RM		
161			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
162			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
163			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
164			JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
165			(N)HXH-J FE180 PH90/E90 4x50 RM		
166			(N)HXH-J FE180 PH90/E90 4x50 RM		
167			(N)HXH-J FE180 PH90/E90 4x1.5 RE		
168			(N)HXH-J FE180 PH90/E90 4x1.5 RE		

Lp	Symbol kabla	Średnica kabla (około)	Ciężar kabla [kg/m], około	Ilość
1	NHXH-J FE180 PH30/E30 4x1.5 RE	14 mm	0,3	8
2	NHXH-J FE180 PH30/E30 4x50 RM	32 mm	2,7	8
3	NHXH-J FE180 PH90/E90 4x1.5 RE	14 mm	0,3	18
4	NHXH-J FE180 PH90/E90 4x50 RM	33 mm	2,7	12
5	NHXCH FE180 PH30/E30 4x1.5/1.5 RE	15 mm	0,4	4
6	NHXCH FE180 PH30/E30 4x50/25 RM	33 mm	2,9	4
7	NHXCH FE180 PH90/E90 4x1.5/1.5 RE	15 mm	0,4	4
8	NHXCH FE180 PH90/E90 4x50/25 RM	35 mm	2,9	4
9	(N)HXH-J FE180 PH30/E30 4x1.5 RE	14 mm	0,3	6
10	(N)HXH-J FE180 PH30/E30 4x50 RM	33 mm	2,8	6
11	(N)HXH-J FE180 PH90/E90 4x1.5 RE	14 mm	0,3	18
12	(N)HXH-J FE180 PH90/E90 4x50 RM	33 mm	2,8	18
13	(N)HXCH FE180 PH30/E30 4x1.5/1.5 RE	15 mm	0,3	4
14	(N)HXCH FE180 PH30/E30 4x50/25 RM	34 mm	3	4
15	HTKSH FE180 PH90/E90 1x2x0,8 mm	7 mm	0,1	12
16	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	8 mm	0,1	14
17	HDGs FE180 PH90/E30-E90 2x1 mm2	8 mm	0,1	12
18	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	8 mm	0,1	12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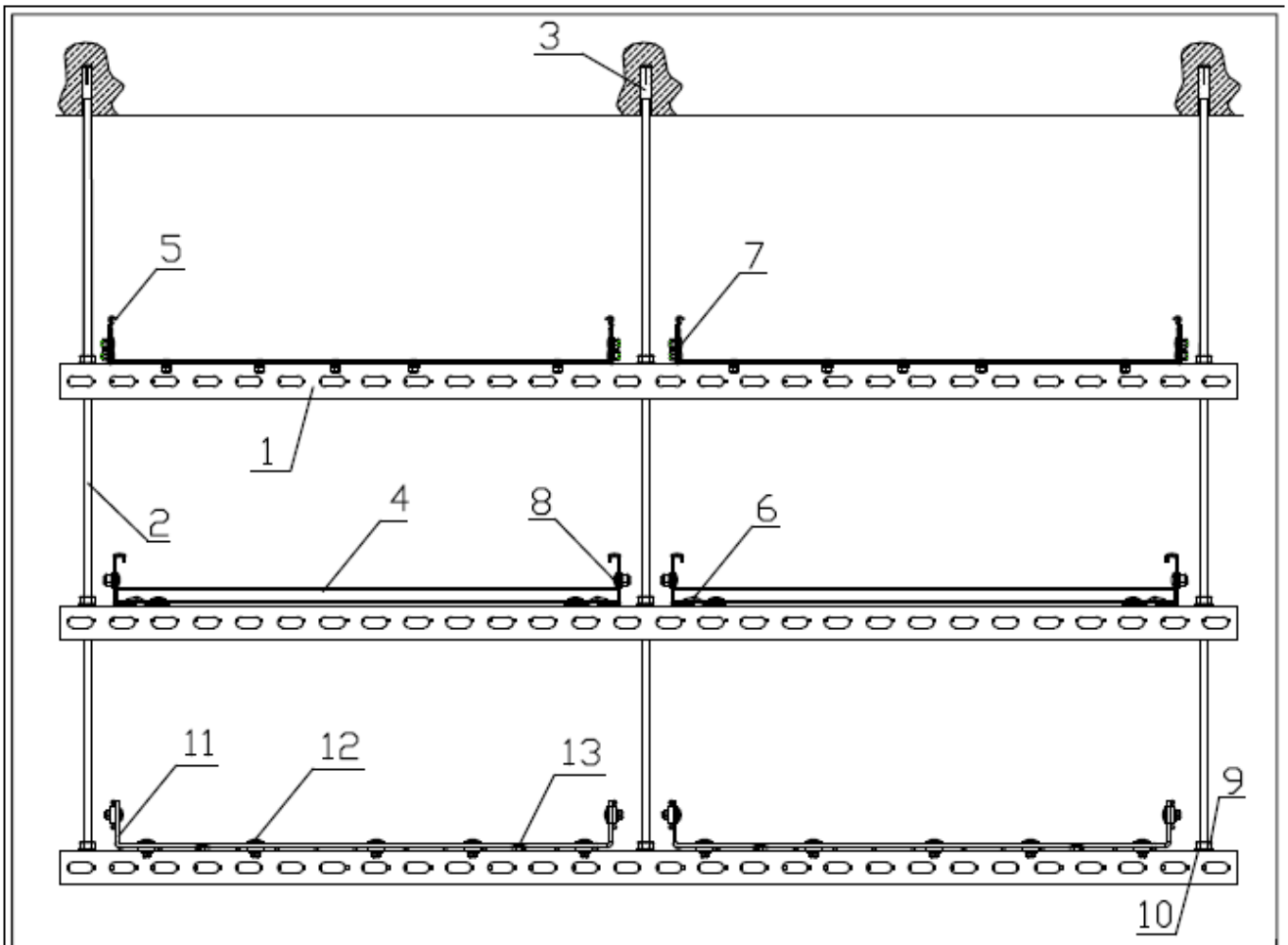
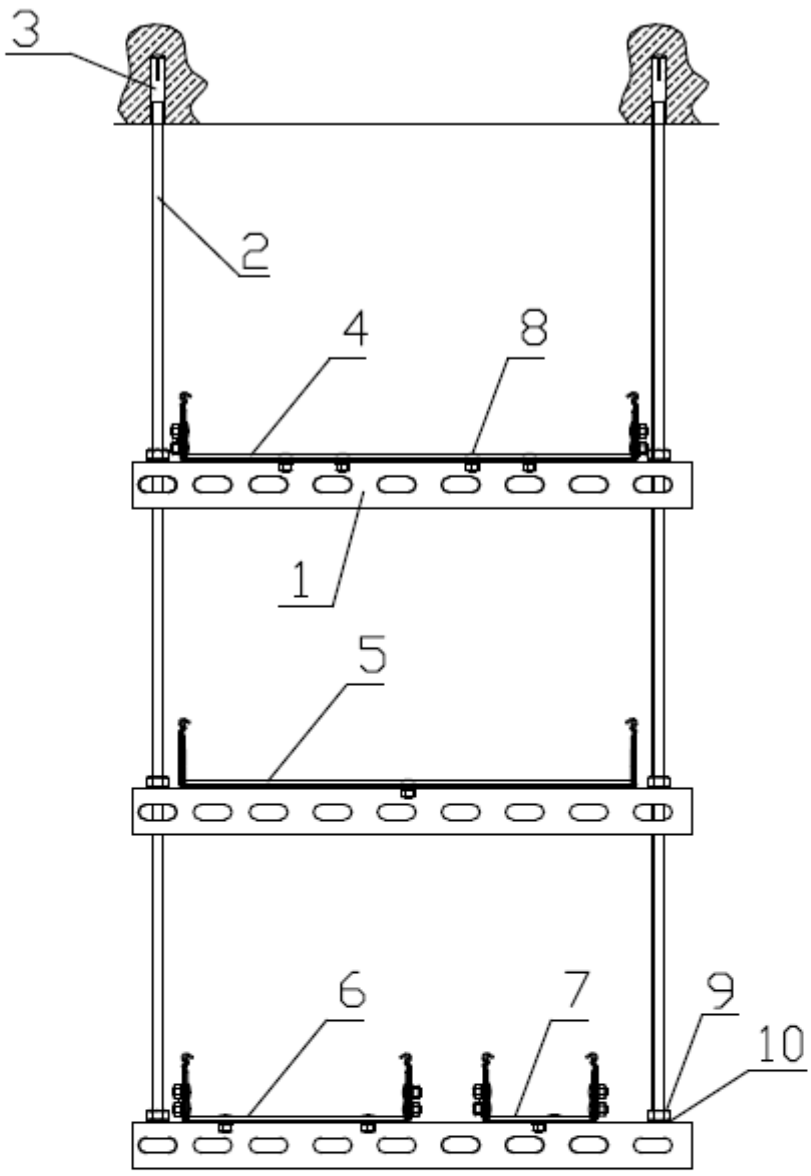
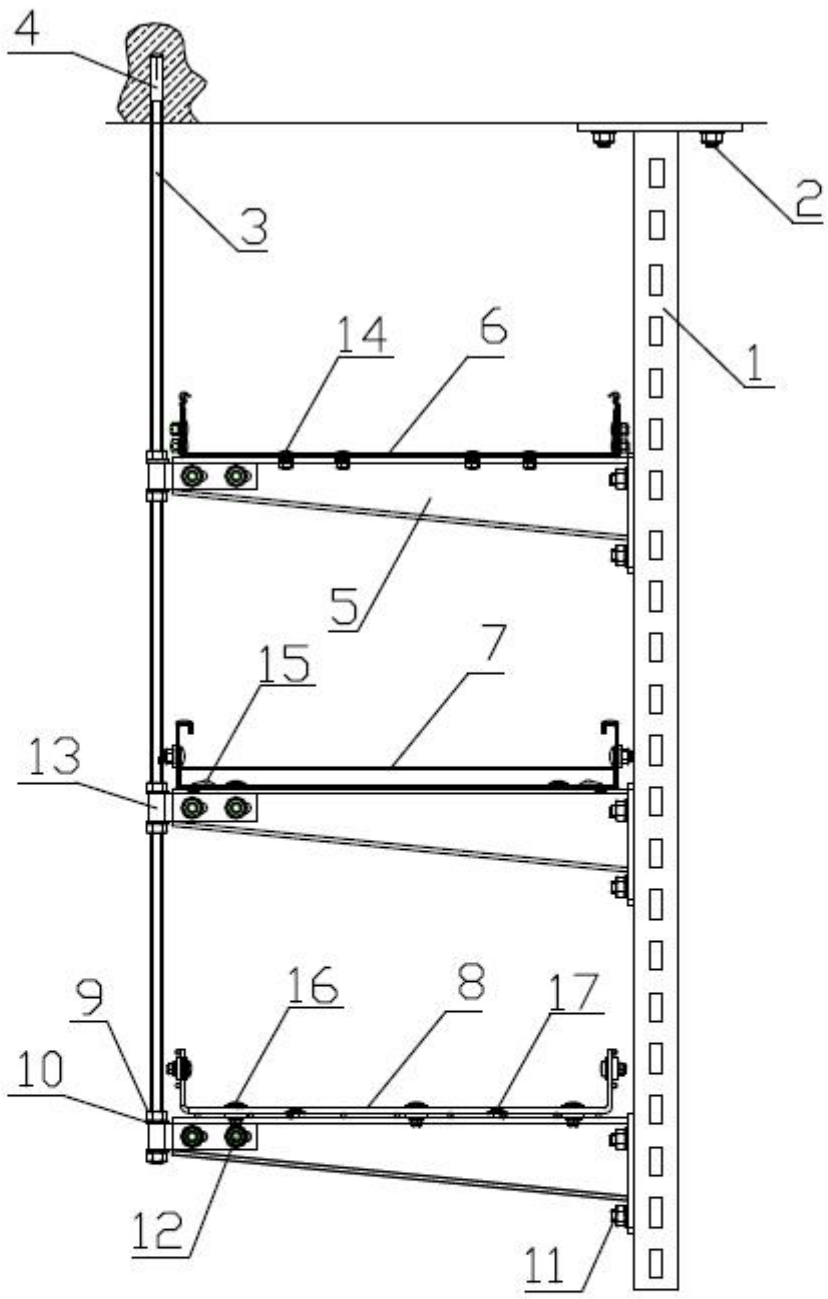


L - lakier proszkowy poliuretanowy

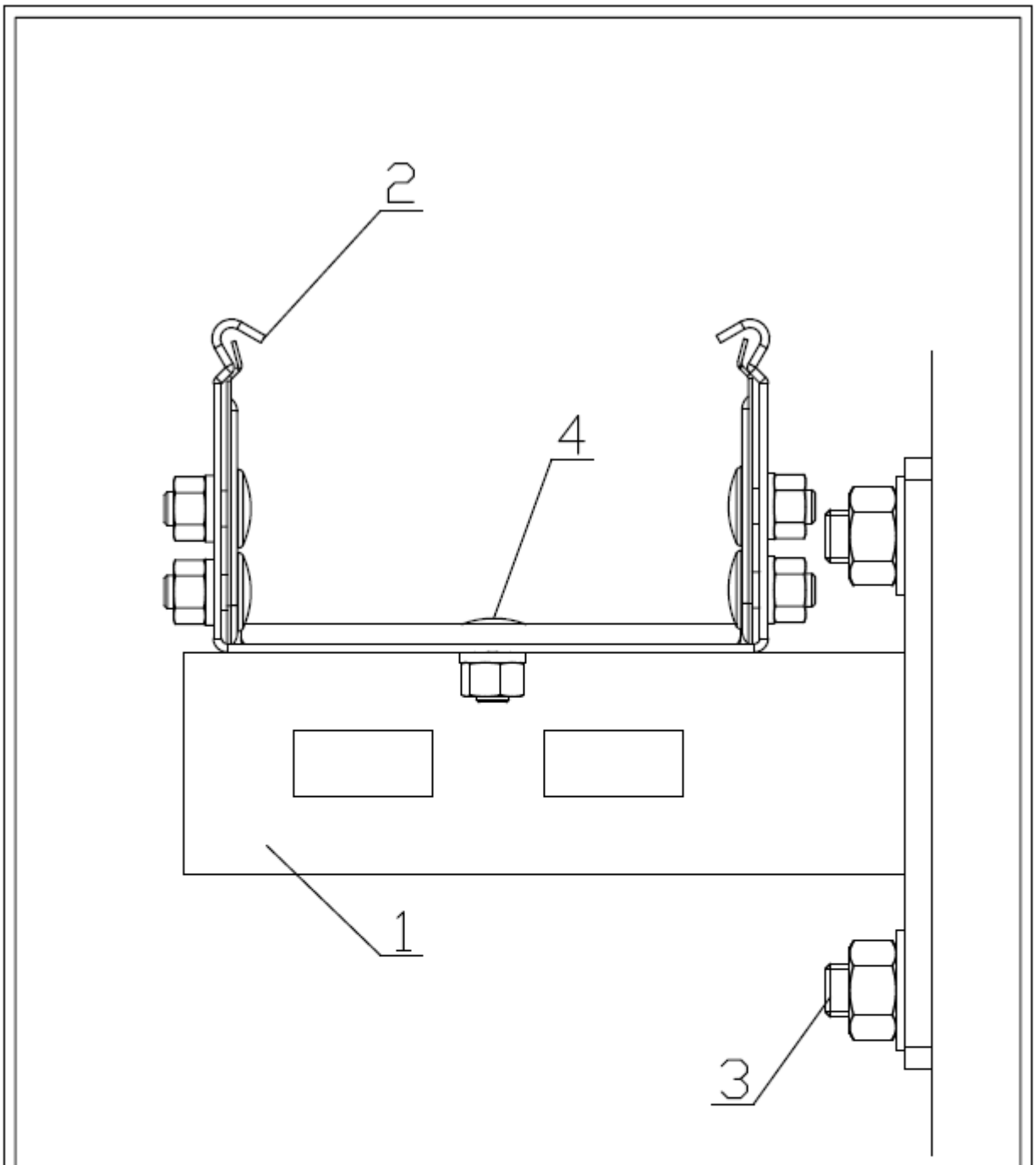
L.p.	Nazwa	Symbol	Szt.
13	Zacisk śrubowy	ZS□	4
12	Uchwyt śrubowy	USS□	14
11	Korytko siatkowe	KDS□600H60/3-L	2
10	Podkładka powiększona	PW10	9
9	Nakrętka	NSM10	9
8	Śruba z łbem grzybkowym	SGNM8x14	8
7	Śruba z łbem grzybkowym	SGNM6x12	18
6	Zacisk mocujący	ZM□	4
5	Korytko	KC□P600H60/3N-L	2
4	Drabinka	DG□P600H60/3N-L	2
3	Tuleja rozporowa stalowa	TRS□M10	3
2	Pręt gwintowany	PGM10/...	3
1	Ceownik wzmocniony	CW□P40H40/...L	3



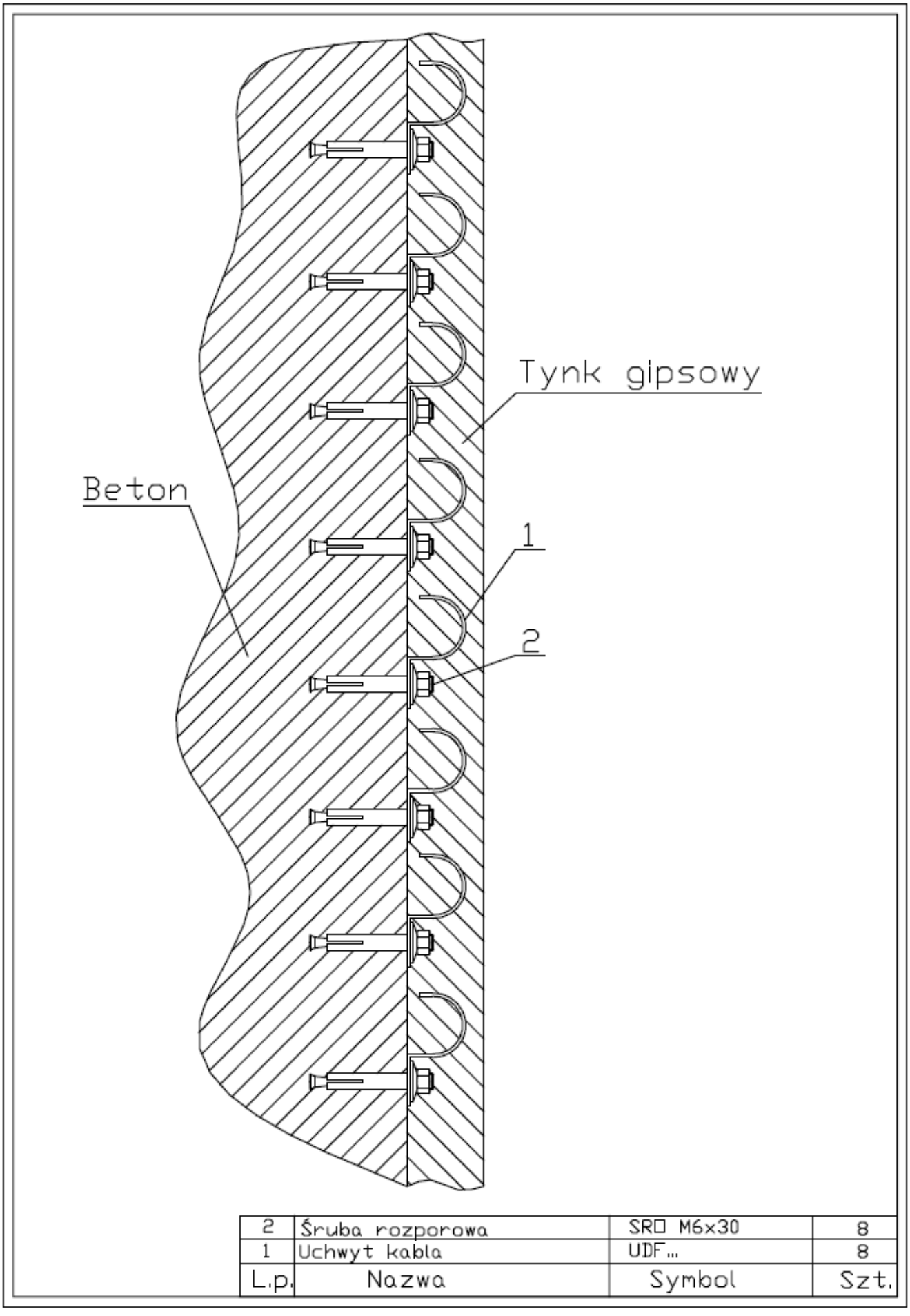
L.p.	Nazwa	Symbol	Szt.
10	Podkładka powiększona	PW10	6
9	Nakrętka	NSM10	6
8	Śruba z łbem grzybkowym	SGNM6x12	20
7	Korytko	KGL100H60/3	2
6	Korytko	KGL200H60/3	2
5	Korytko	KSJ400H60/3	2
4	Korytko	KGJ400H60/3	2
3	Tuleja rozporowa stalowa	TRS□M10	2
2	Pręt gwintowany	PGM10/...	2
1	Ceownik wzmocniony	CW□P40H40/...	2



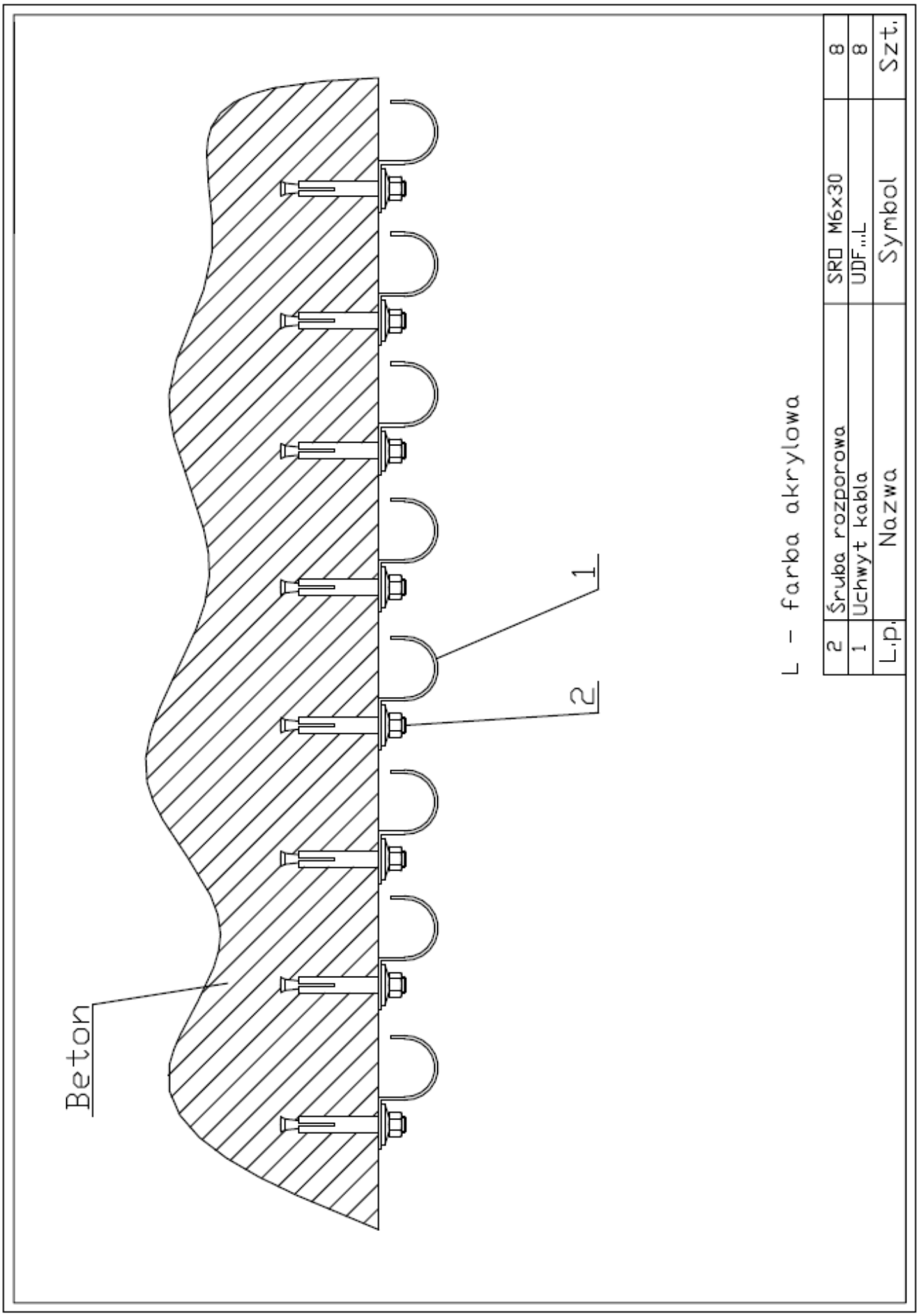
17	Zaclsk śrubowy	ZS□	2
16	Uchwyt śrubowy	USS□	5
15	Zaclsk mocujący	ZM□	2
14	Śruba z łbem grzybkowym	SGNM6x12	8
13	Uchwyt	UPW□	3
12	Śruba z łbem grzybkowym	SGNM8x14	10
11	Śruba (komplet)	SMM10x20	6
10	Podkładka powiększona	PW10	6
9	Nakrętka	NSM10	6
8	Korytko siatkowe	KDS□400H60/3	2
7	Drabinka	DG□P400H60/3	2
6	Korytko	KC□P400H60/3N	2
5	Wysięgnik	WMC□400	3
4	Tuleja rozporowa stalowa	TRS□M10	1
3	Pręt gwintowany	PGM10/...	1
2	Śruba rozporowa pierścieniowa	PSR□M10x80	2
1	Wspornik sufitowy	WPC□1000.	1
L.p.	Nazwa	Symbol	Szt.

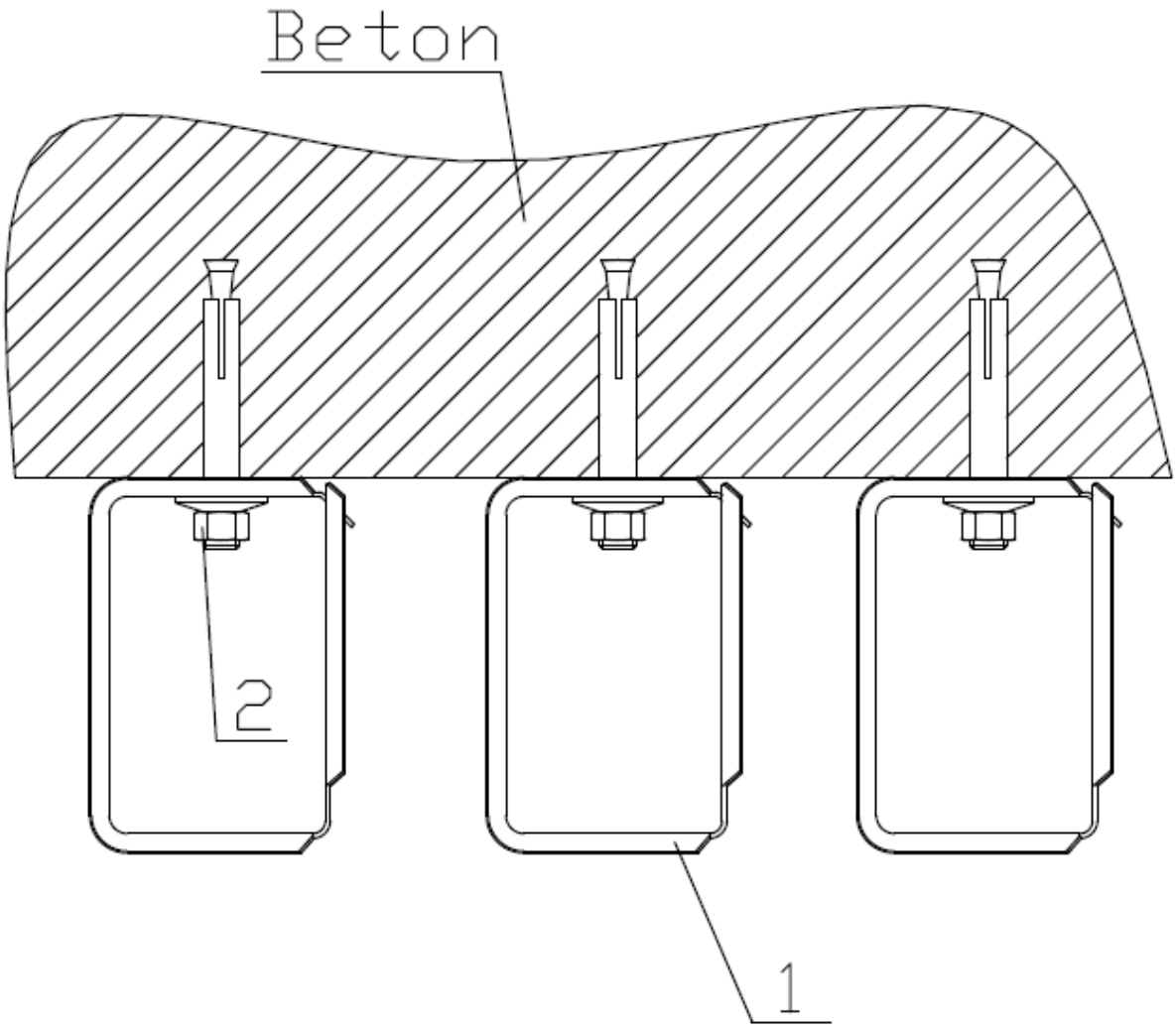


L.p.	Nazwa	Symbol	Szt.
4	Śruba z łbem grzybkowym	SGNM6x12	5
3	Śruba rozp. plerścienlowa	PSR□M10x80	2
2	Korytko	KC□P100H60/3N	2
1	Wysięgnik	WPT□100	1

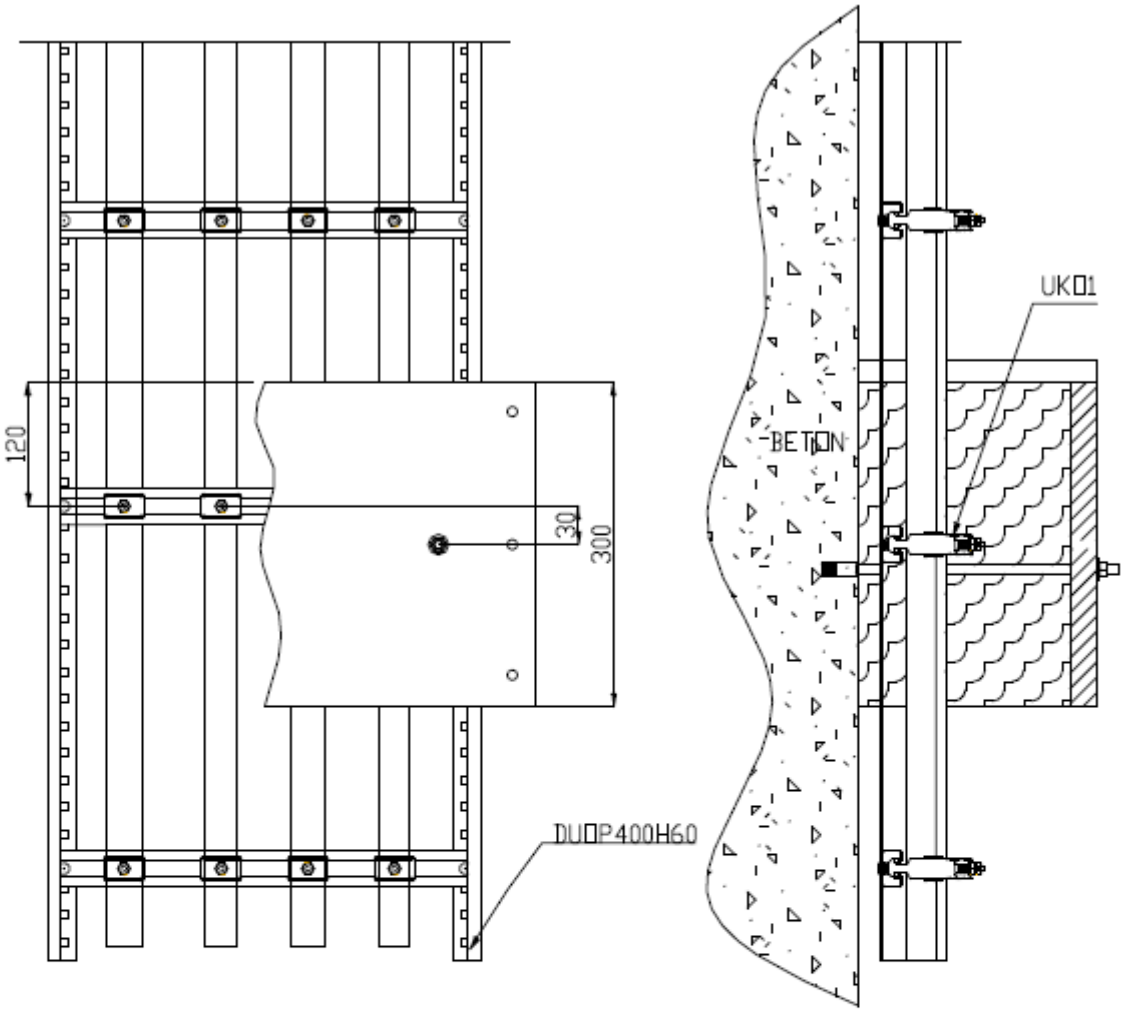


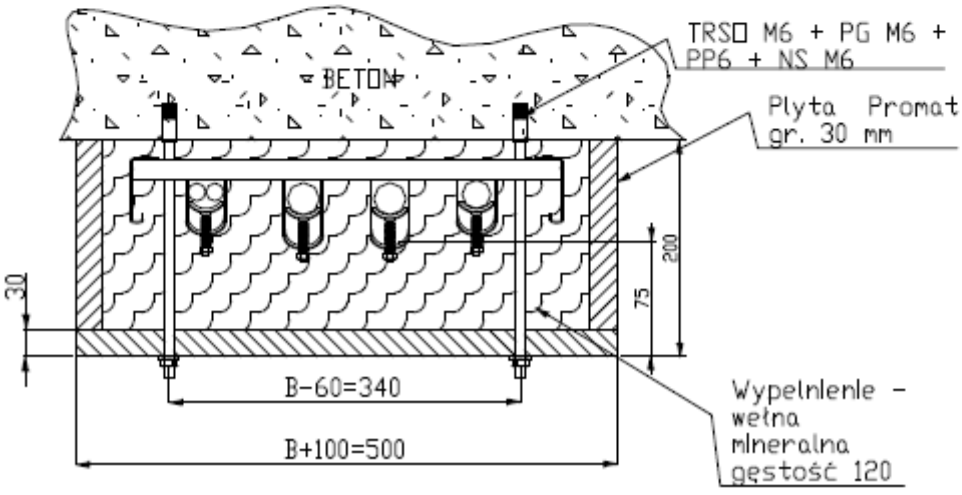
L.p.	Nazwa	Symbol	Szt.
2	Śruba rozporowa	SRD M6x30	8
1	Uchwyt kabla	UDF...	8

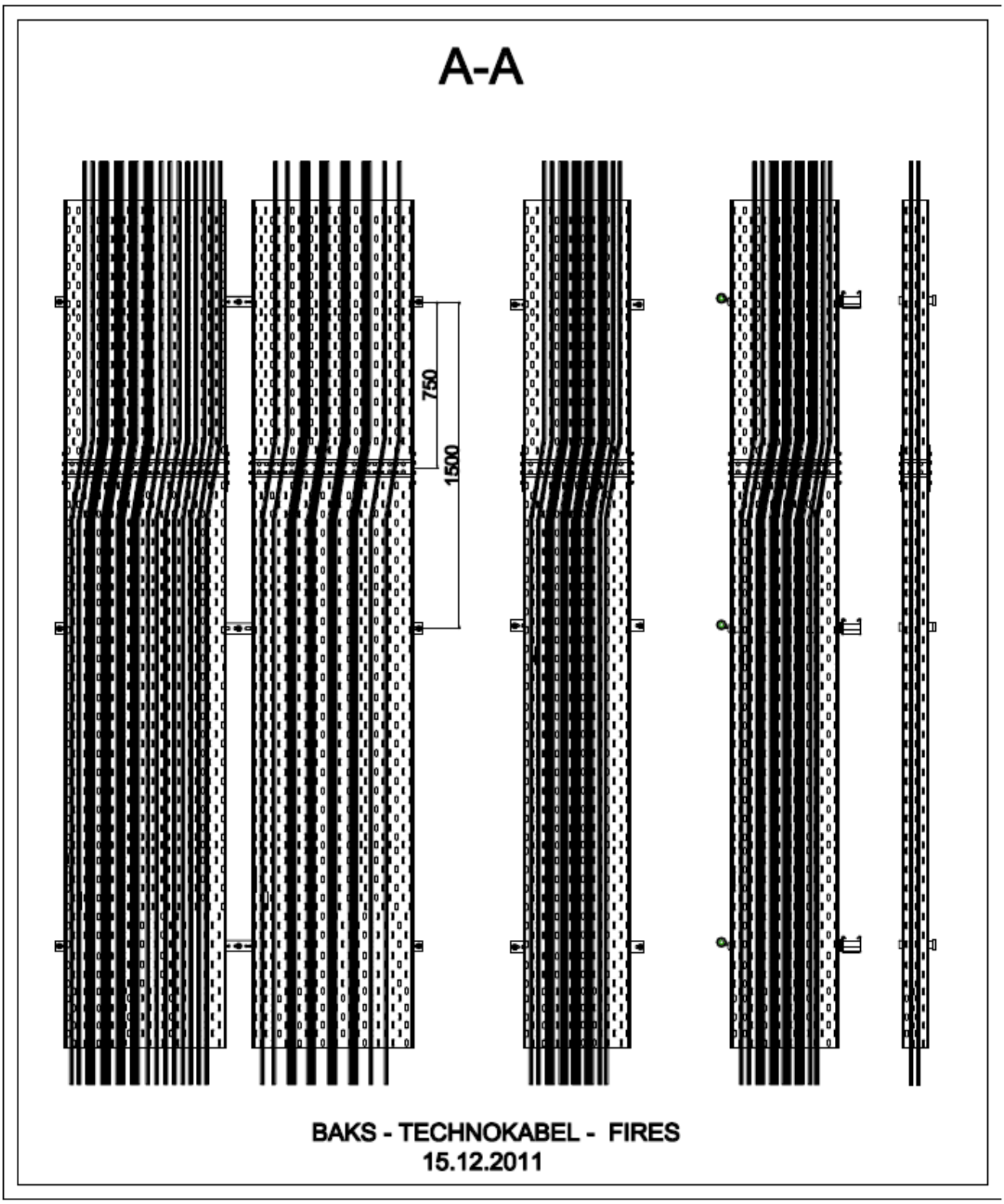

Beton
1
2
L - farba akrylowa
2 Śruba rozporowa SRD M6x30 8
1 Uchwyt kabla UDF...L 8
L.p. Nazwa Symbol Szt.



L.p.	Nazwa	Symbol	Szt.
2	Śruba rozporowa	SR□ M6x30	3
1	□bejma zatrzaskowa	□ZM□	3


120
30
300
UK□1
BETON
DU□P400H60


BETON
TRS□ M6 + PG M6 +
PP6 + NS M6
Plyta Promat
gr. 30 mm
30
75
200
B-60=340
B+100=500
Wypelnienie -
wełna
mineralna
gęstość 120


A-A
750
1500
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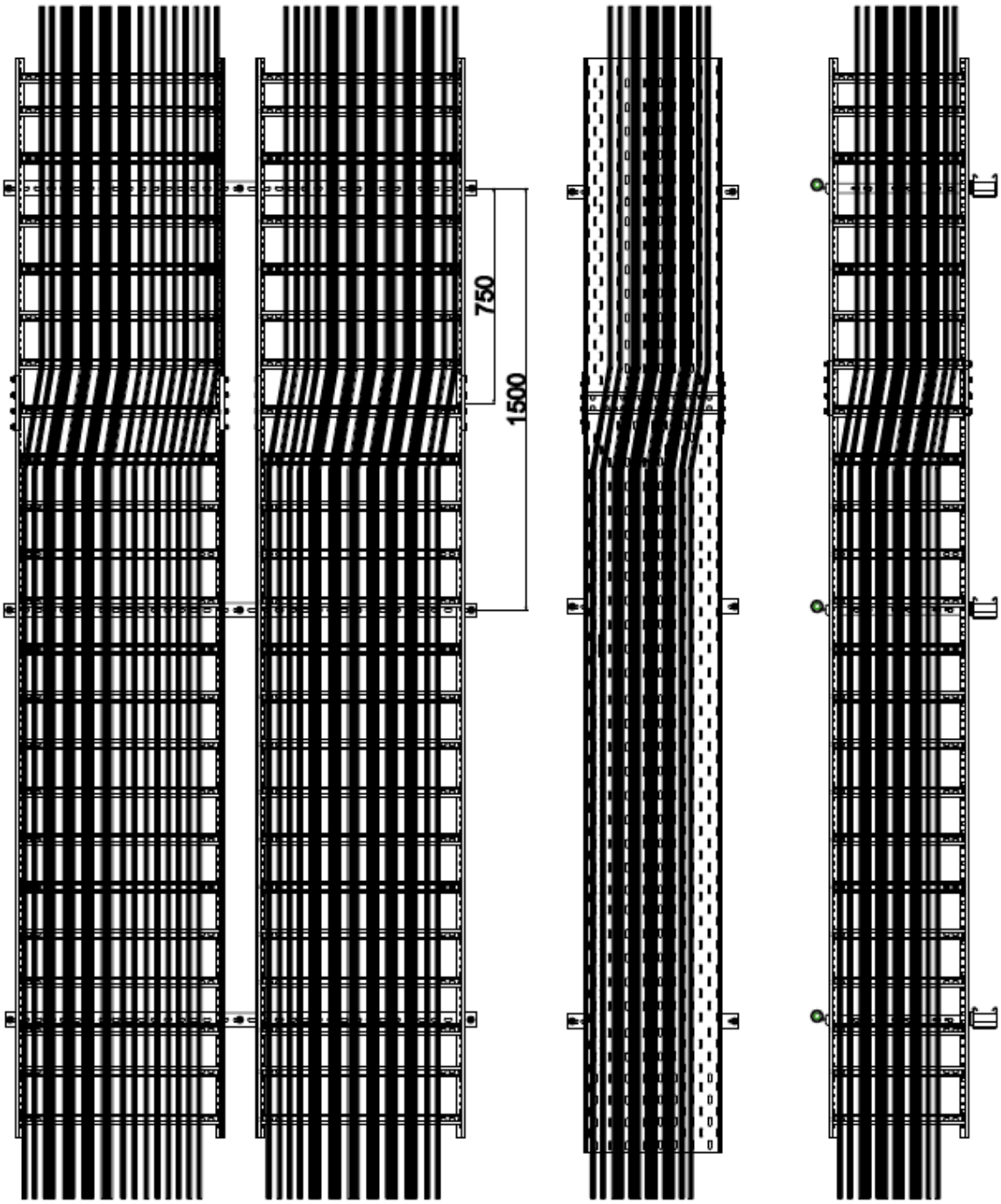
15.12.2011

B-B



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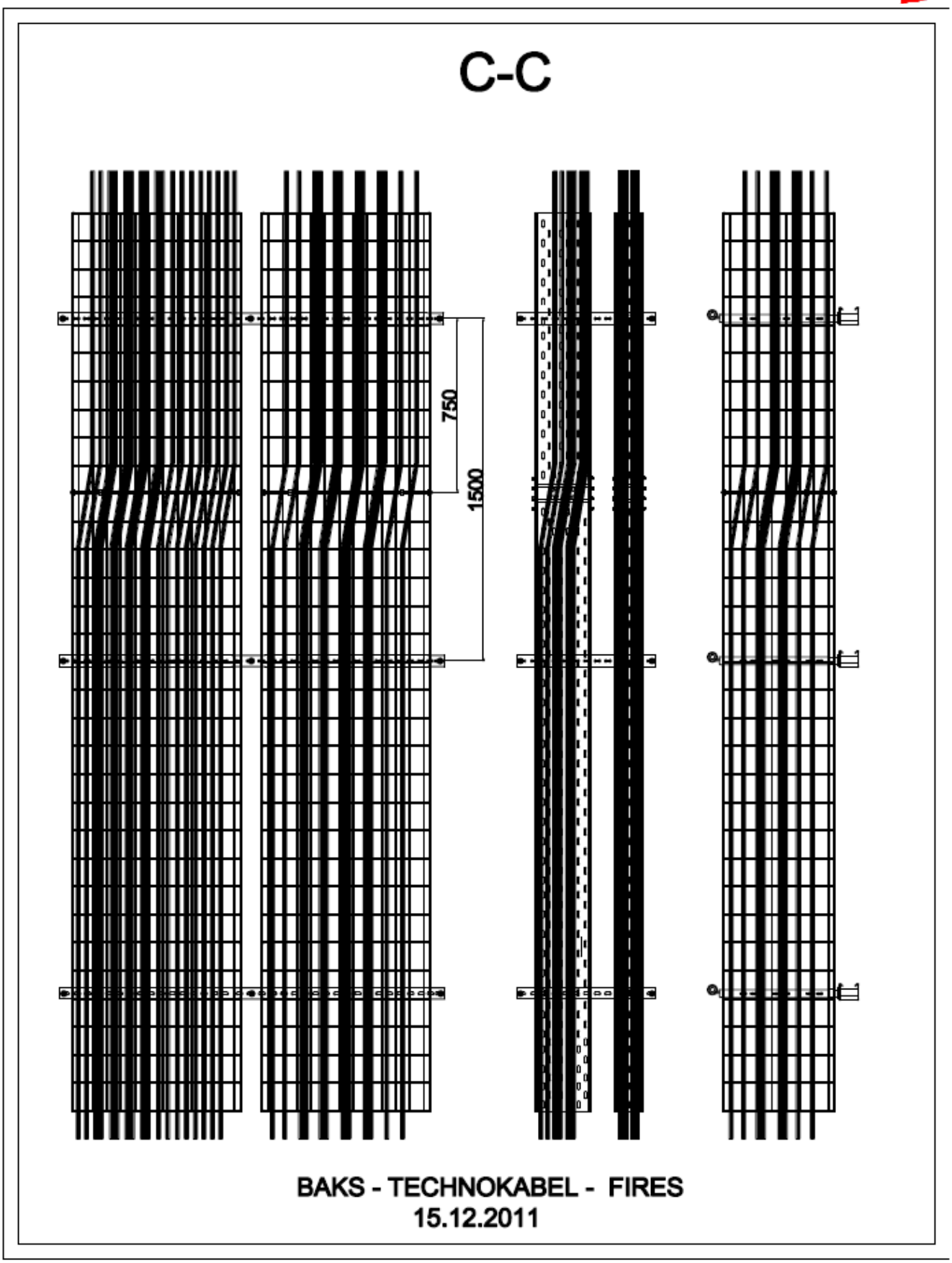
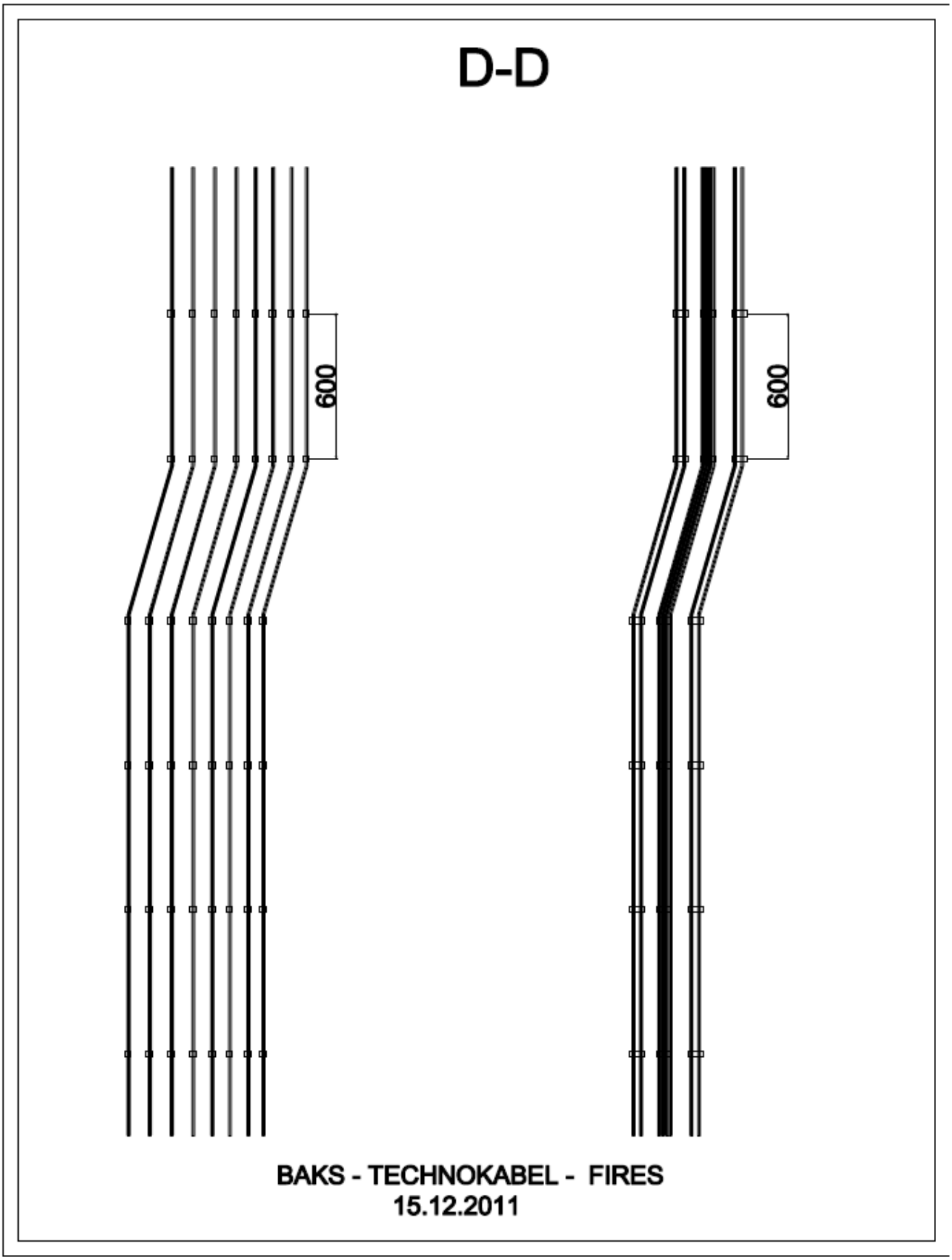
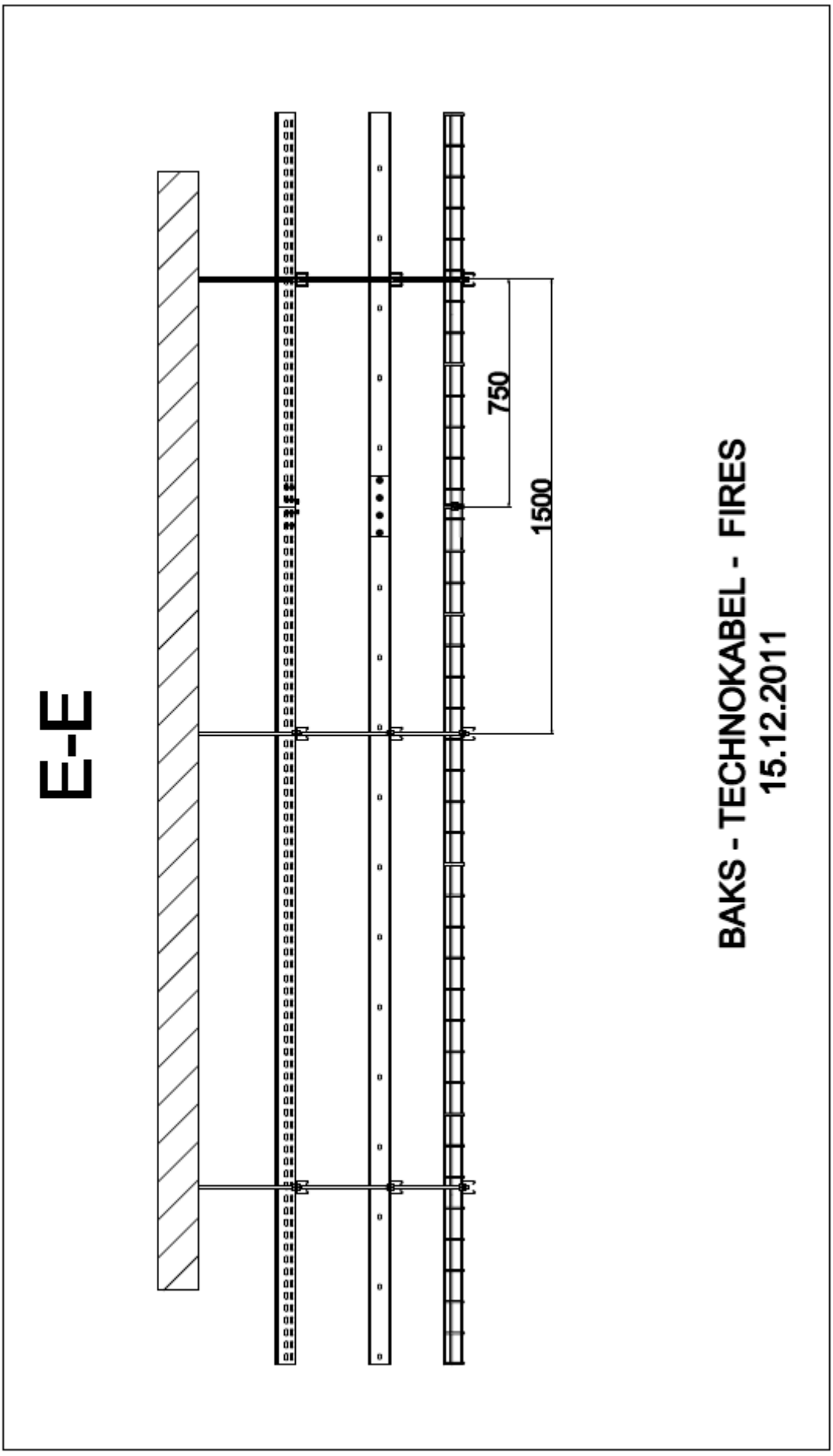
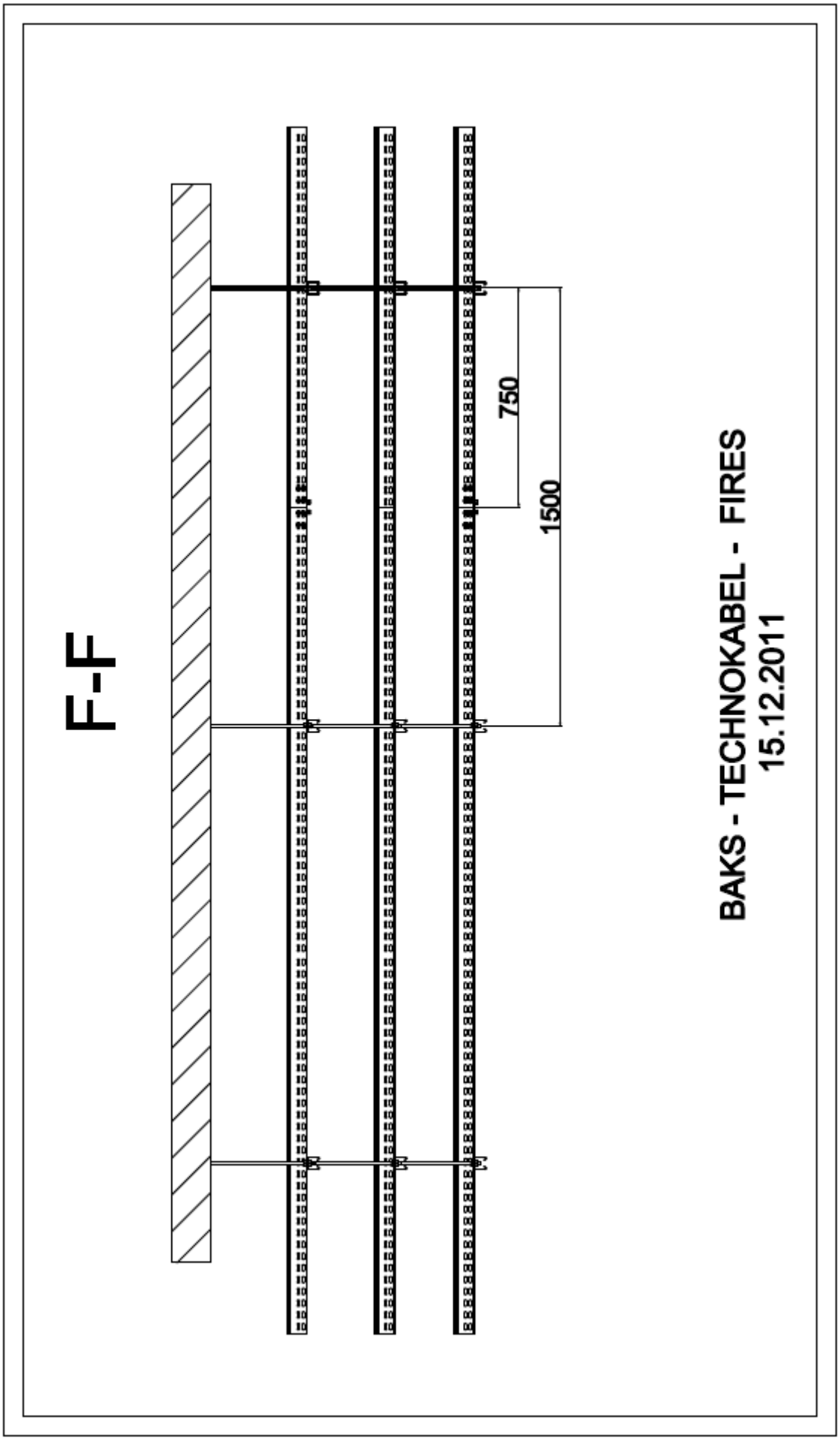
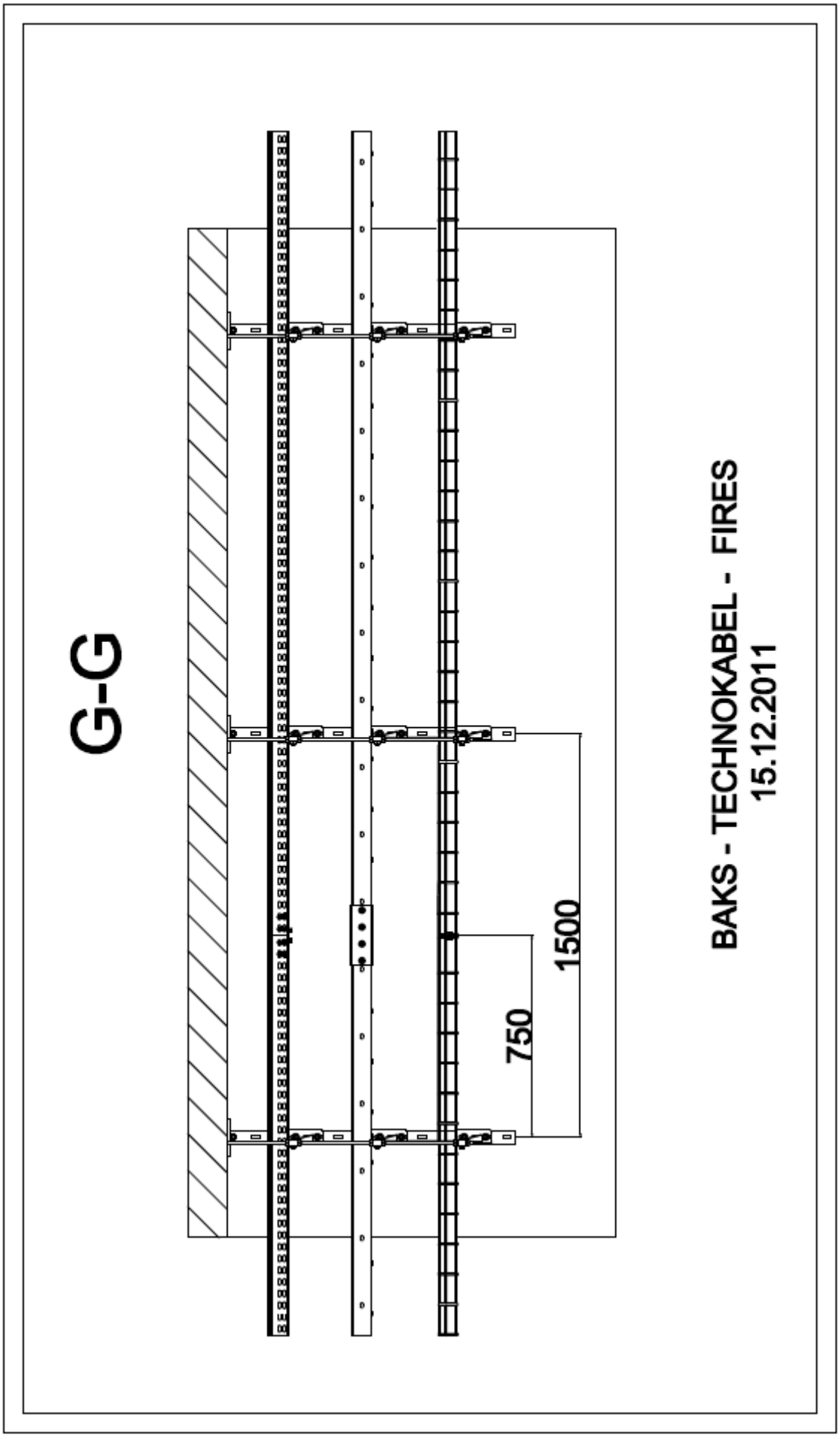
15.12.2011

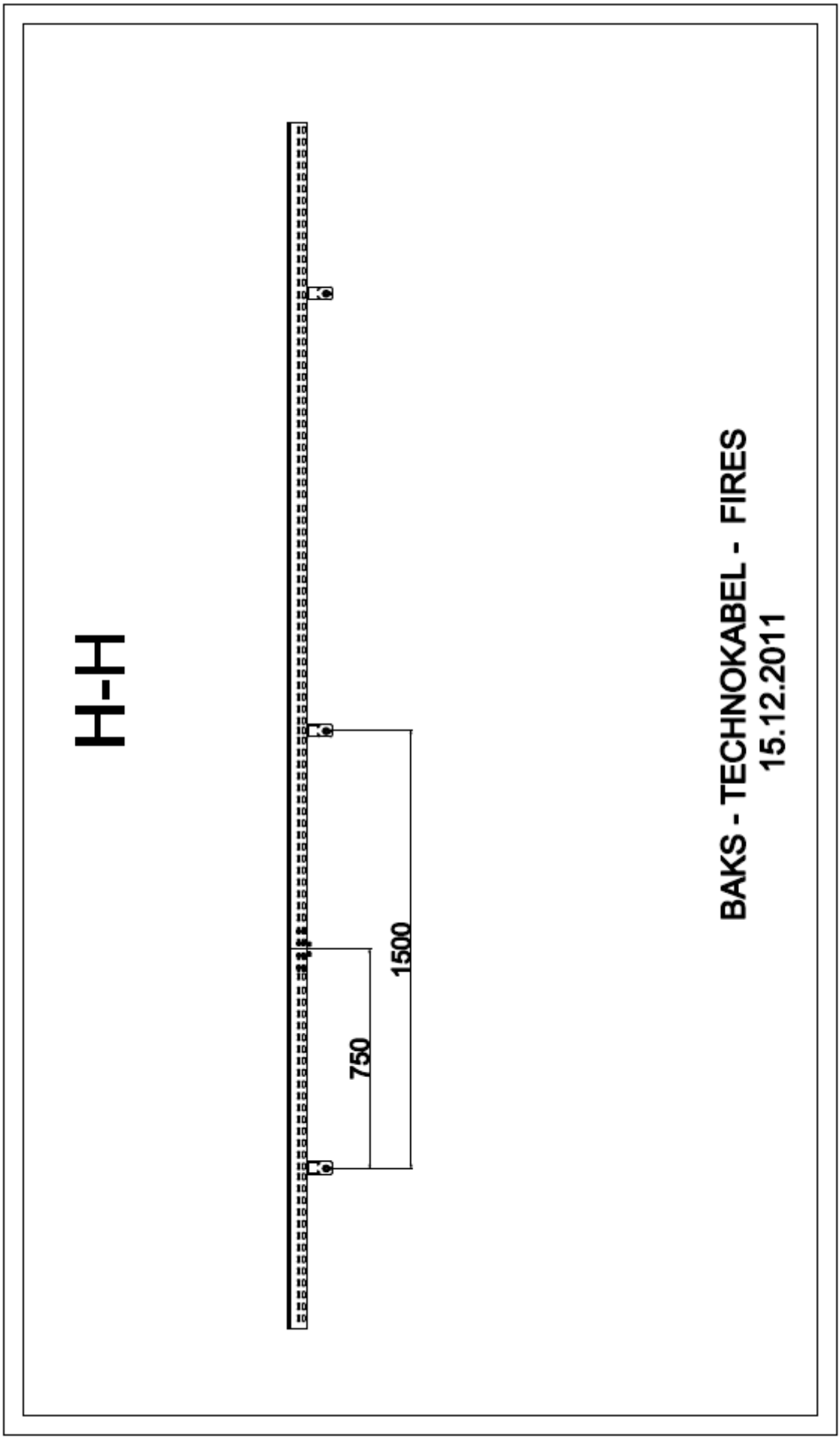

C-C
750
1500
BAKS - TECHNOKABEL - FIRES
15.12.2011

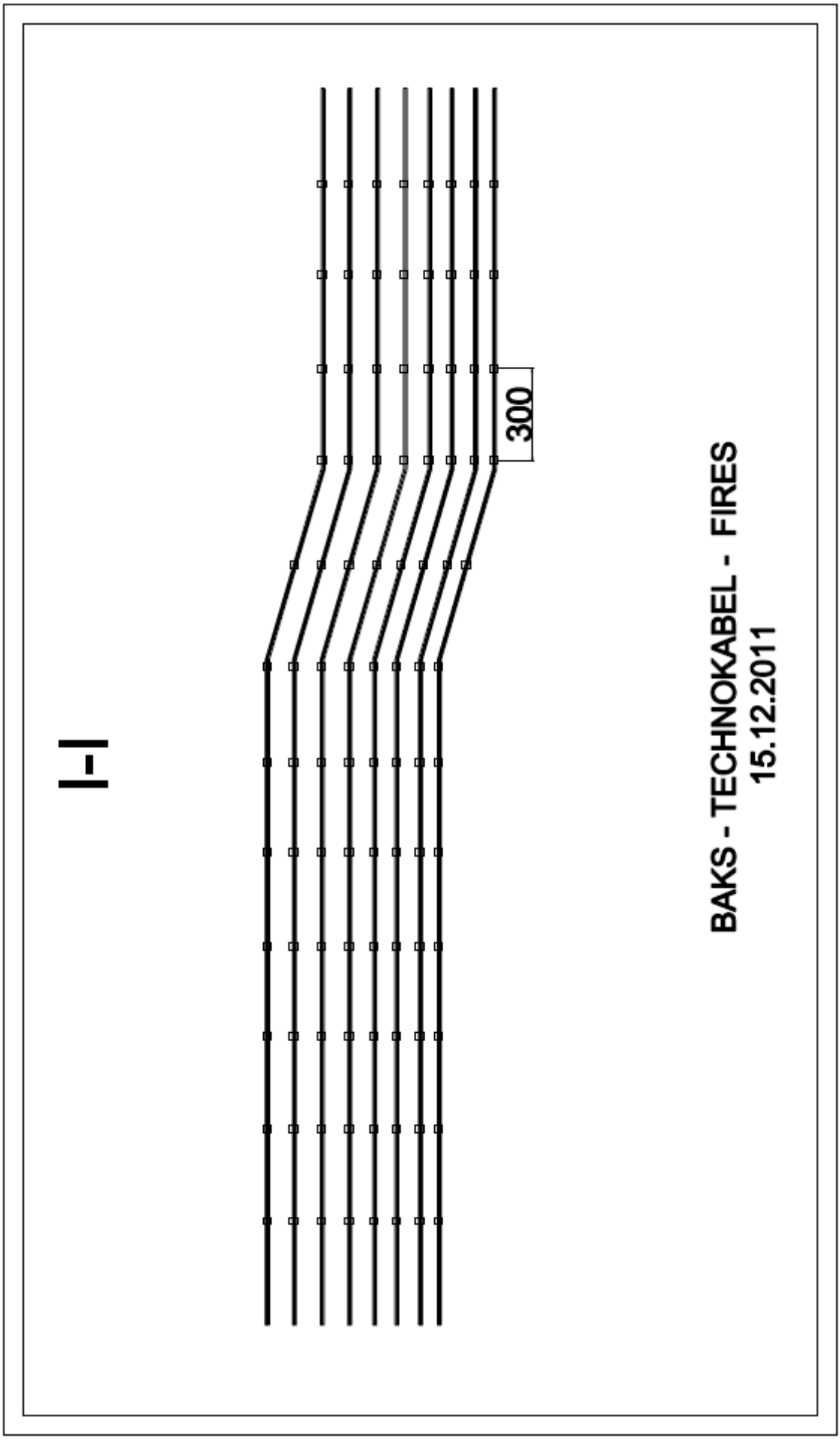

D-D
600
600
BAKS - TECHNOKABEL - FIRES
15.12.2011


E-E
750
1500
BAKS - TECHNOKABEL - FIRES
15.12.2011

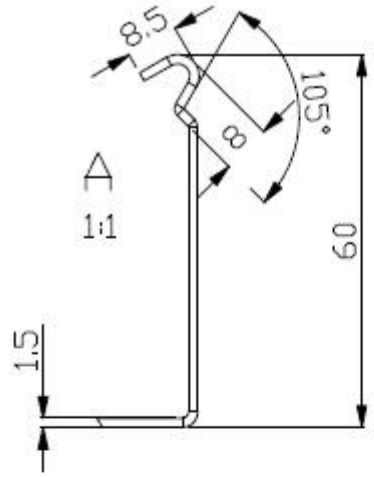

F-F
750
1500
BAKS - TECHNOKABEL - FIRES
15.12.2011

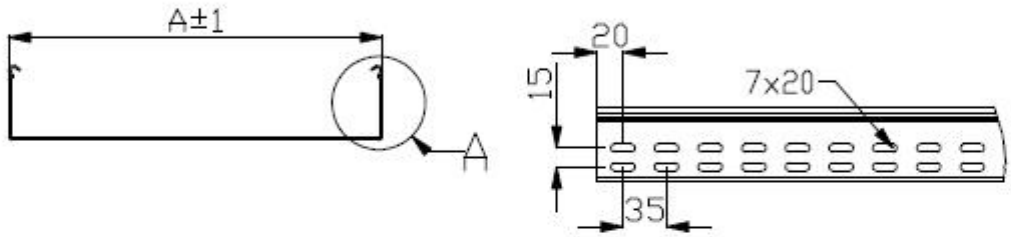

G-G
1500
750
BAKS - TECHNOKABEL - FIRES
15.12.2011

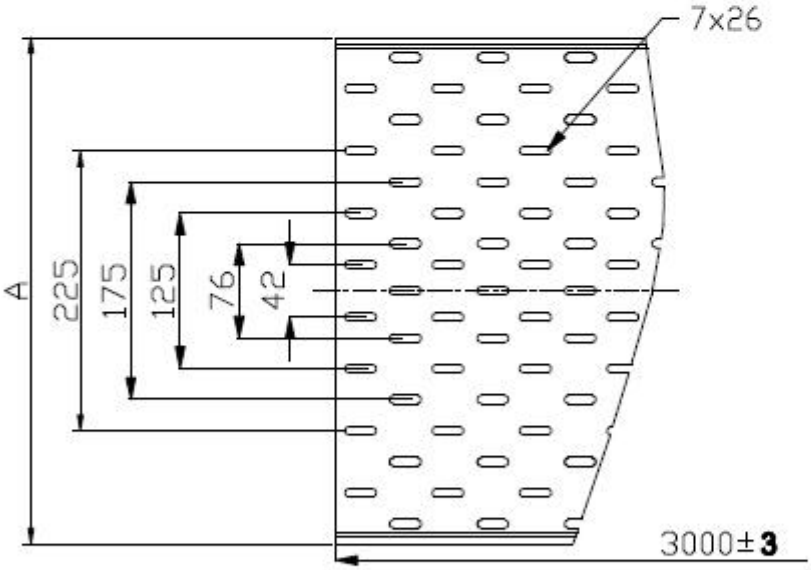

H-H
1500
750
BAKS - TECHNOKABEL - FIRES
15.12.2011


300
BAKS - TECHNOKABEL - FIRES
15.12.2011

Typ	Szerokość A(mm)	Długość L(mm)
KCOP100H60/3N-L	100	3000
KCOP200H60/3N-L	200	3000
KCOP300H60/3N-L	300	3000
KCOP400H60/3N-L	400	3000
KCOP500H60/3N-L	500	3000
KCOP600H60/3N-L	600	3000

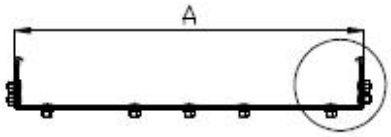


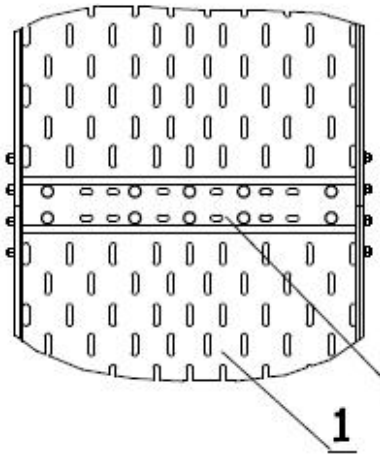


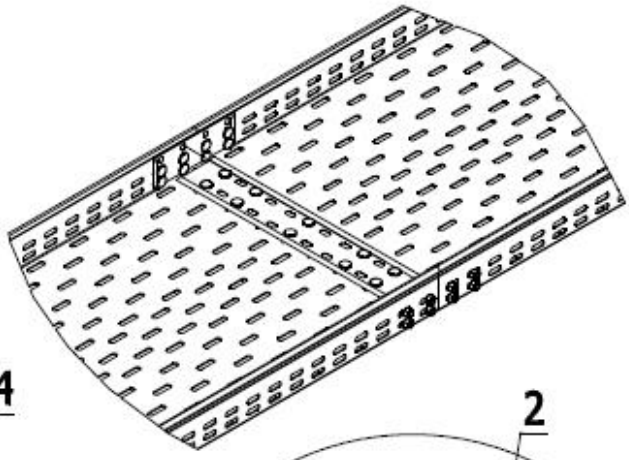


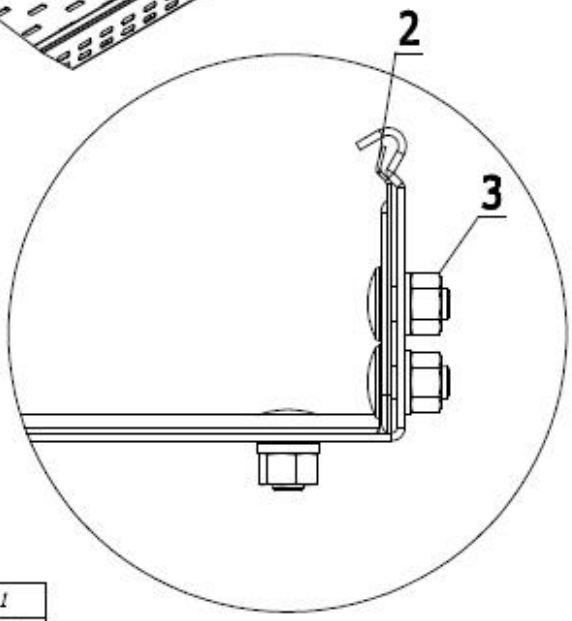
L-lakier proszkowy poliuretanowy

Odchyłka wymiarów nieoblerowanych		Materiał: Gatunek		Masa [kg]	Podziałka	Format A4
		Nr normy				Arkusz
		półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: KCOP...H60/3N-L		
Rysował						
Sprawdził						
Zatwierdził				Nr programu maszynowego		Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku		









Poz.1		Poz.4
A	Typ	Typ
100	KCOP100H60/3N-L	BLO100N-L
200	KCOP200H60/3N-L	BLO200N-L
300	KCOP300H60/3N-L	BLO300N-L
400	KCOP400H60/3N-L	BLO400N-L
500	KCOP500H60/3N-L	BLO500N-L
600	KCOP600H60/3N-L	BLO600N-L

Pos.	Nazwa	Symbol	Ilość
4	Blacha łącznikowa	BLO600N-L	1
3	Śruba	SGN M6x12	26
2	Łącznik	LPOPH60N-L	2
1	Koryto	KCOP600H60/3N-L	2

Odchyłka wymiarów nietolerowanych

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

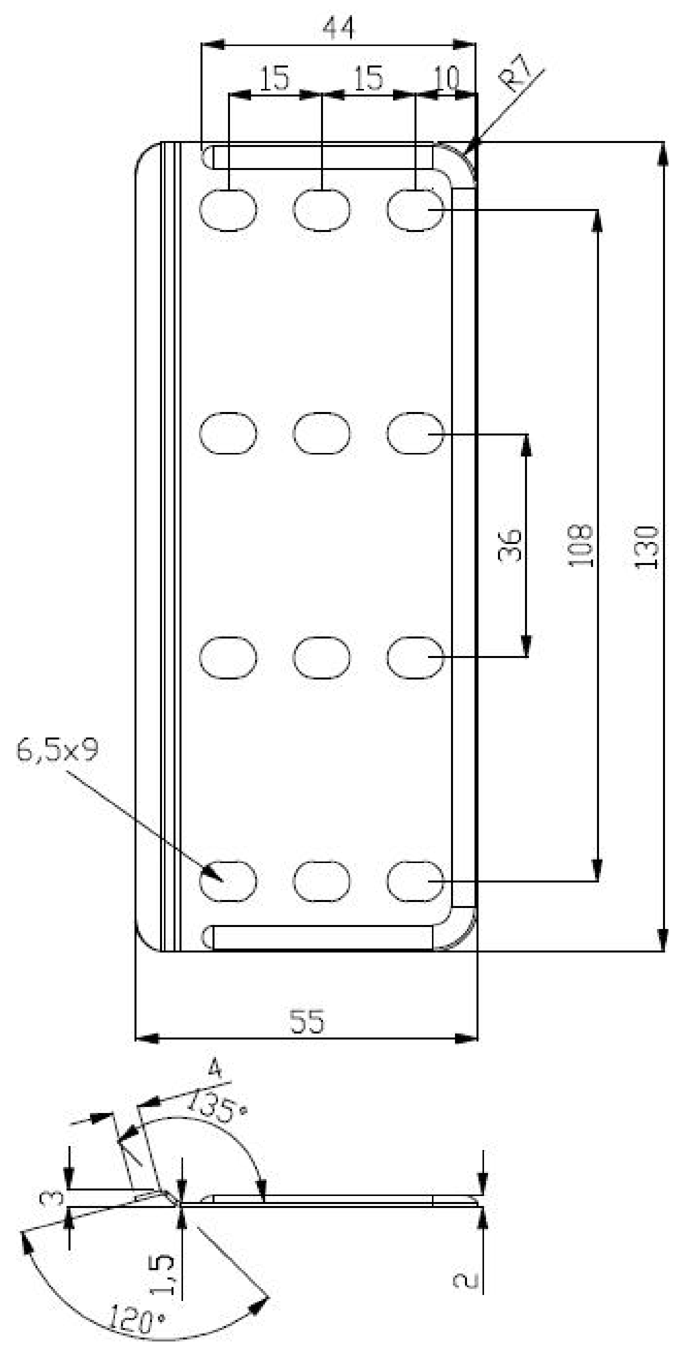
Masa 1szt | Podziałka | Format A4 | Arkusz 1 | Arkuszy 1

Projektował | Rysował | Sprawdził | Zatwierdził | Nazwisko | Podpis | Data

Nazwa rysunku: Połączenie KCOP600H60/3N-L

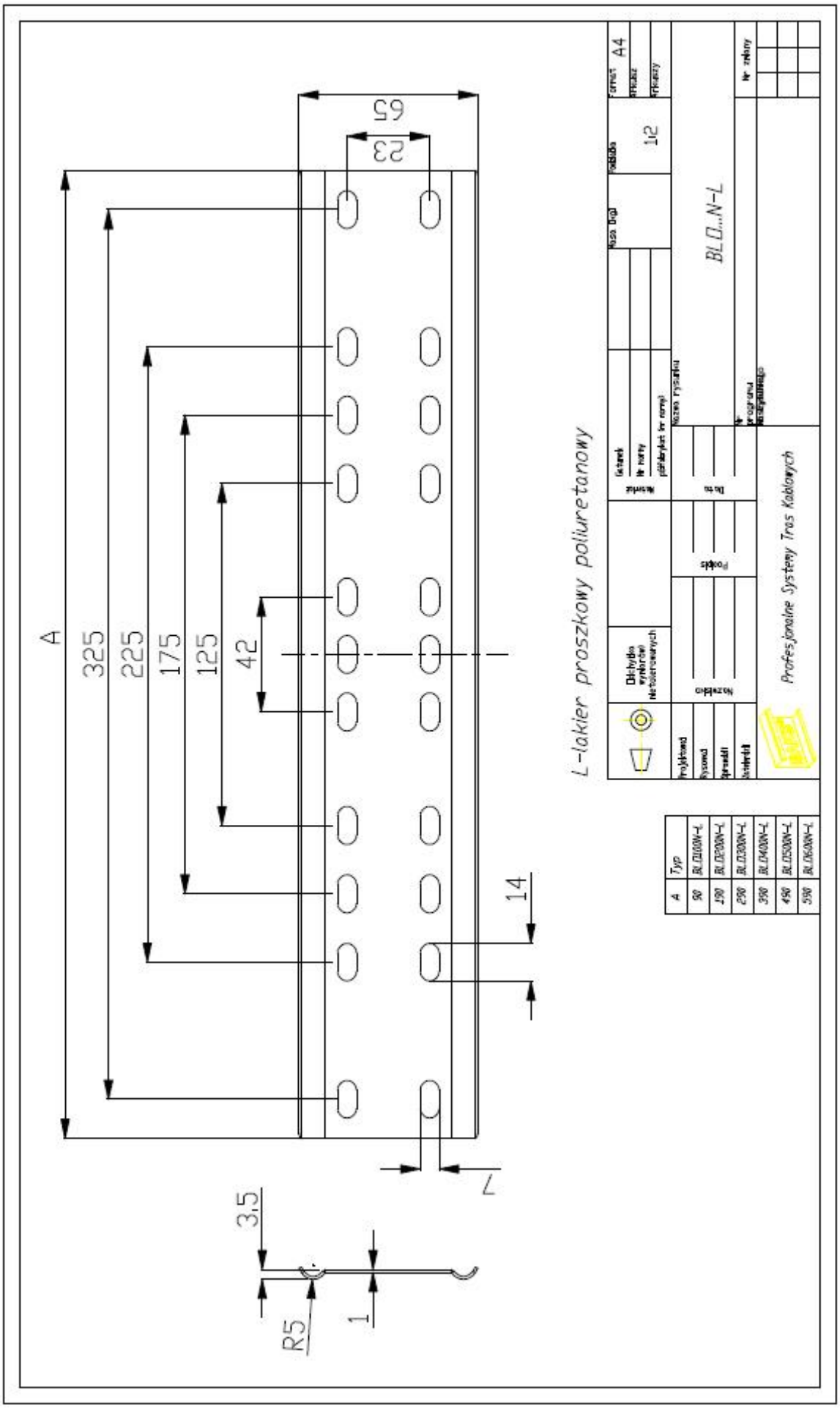
Nr programu maszynowego | Nr rysunku | Nr zmiany

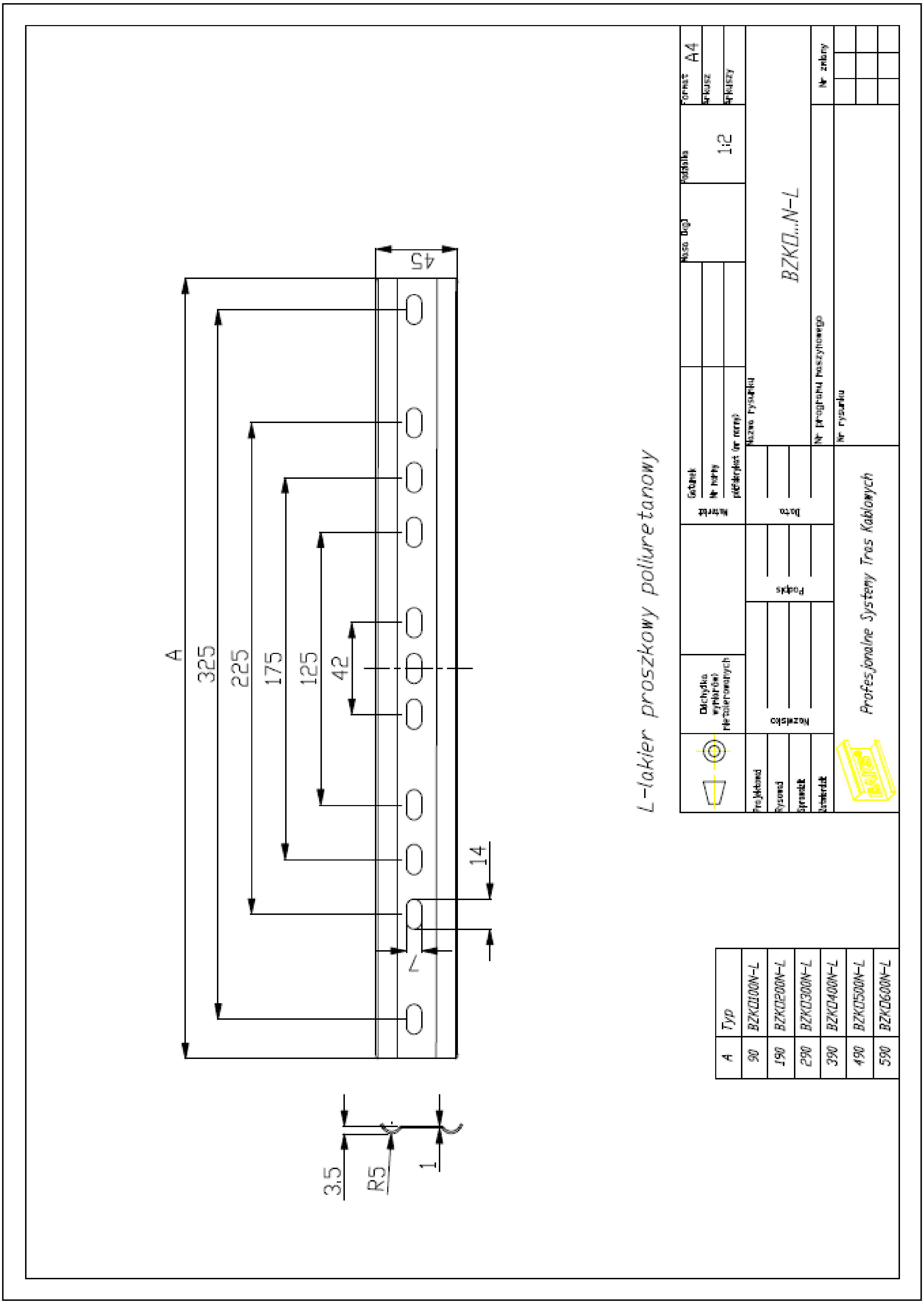
Profesjonalne Systemy Tras Kablowych



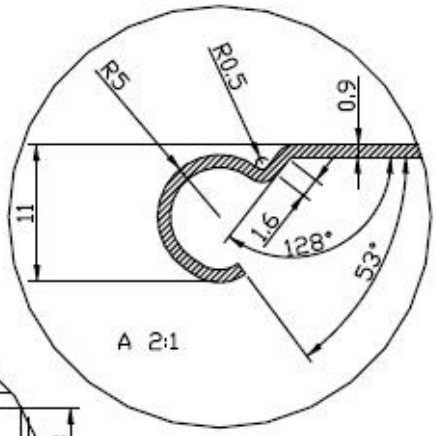
L-lakier proszkowy poliuretanowy

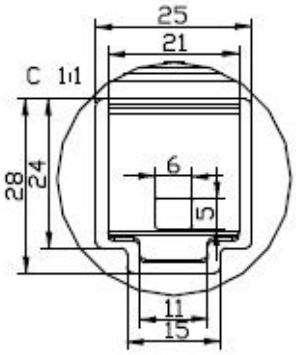
Dokładność wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
			Nr normy			1:1	Arkusz
			półfabrykat (Nr normy)				Arkuszy
Projektował	J.GROCHOWSKI	Podpis	Data	Nazwa rysunku: LP□PH60N-L			
Rysował	J.Grochowski						
Sprawdził	T.WLODARCZYK						
Zatwierdził	J.KLICZEK			Nr programu maszynowego			Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku			

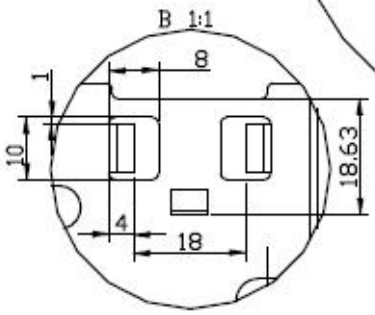

65
23
A
325
225
175
125
42
14
L
3,5
R5
1
L-lakier proszkowy poliuretanowy
BL□..N-L
Profesjonalne Systemy Tras Kablowych
A
Typ
50
BL□050N-L
100
BL□100N-L
150
BL□150N-L
200
BL□200N-L
300
BL□300N-L
400
BL□400N-L
500
BL□500N-L
600
BL□600N-L

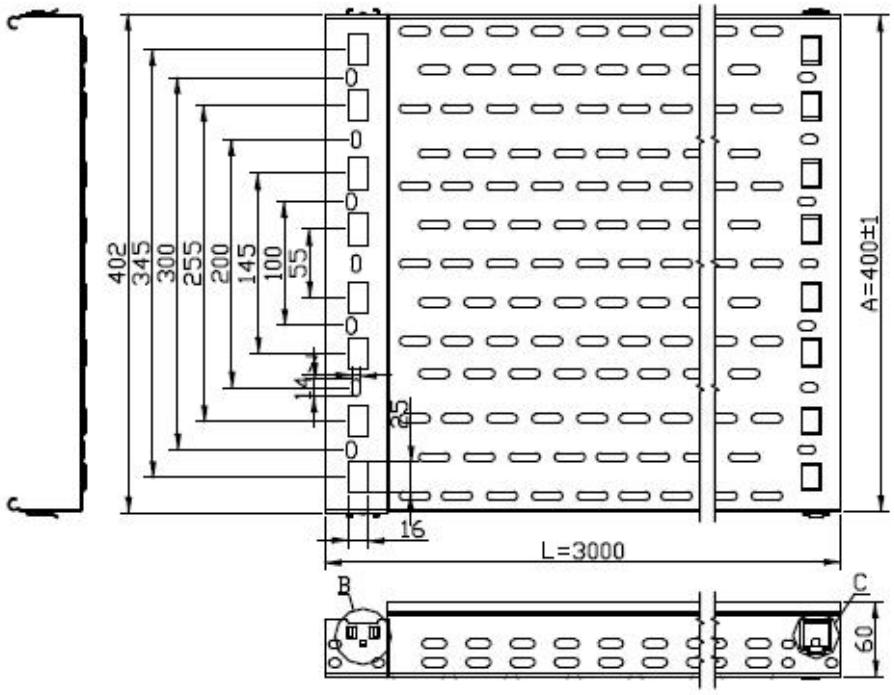

L-lakier proszkowy poliuretanowy
BZKO...N-L
1:2
A4
Profesjonalne Systemy Tras Kablowych
A
325
225
175
125
42
45
14
7
3,5
R5
1
Typ
BZKO100N-L 90
BZKO200N-L 190
BZKO300N-L 290
BZKO400N-L 390
BZKO500N-L 490
BZKO600N-L 590

Typ	Szerokość A(mm)	Długość L(mm)
KS□J100H60/3	100	3000
KS□J200H60/3	200	3000
KS□J300H60/3	300	3000
KS□J400H60/3	400	3000





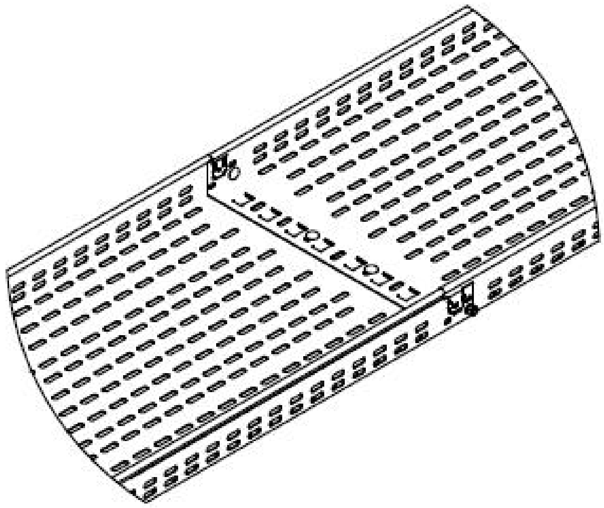


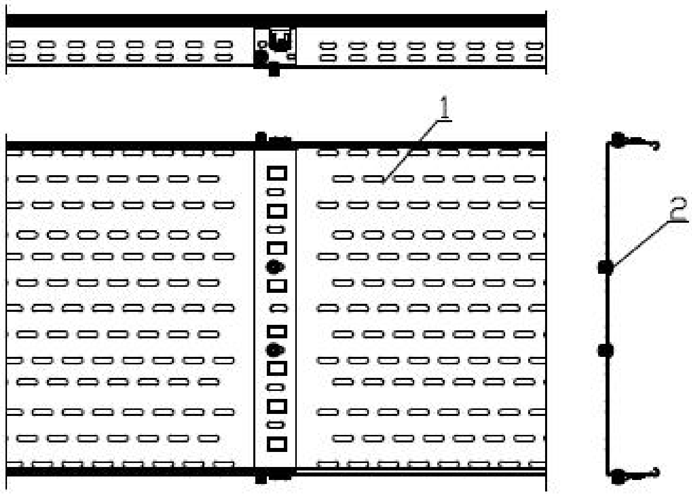


	Dokładność wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 1:5	Format A4
			Nr normy				Arkusz
			półfabrykat (wg normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: KS□J400H60/3			
Rysował							
Sprawdził				Nr programu maszynowego		Nr zmiany	
Zatwierdził				Nr rysunku			

Profesjonalne Systemy Tras Kablowych

Poz.1		Poz.2
A	Typ	Ilość
100	KSDJ100H60/3	2
200	KSDJ200H60/3	2
300	KSDJ300H60/3	2
400	KSDJ400H60/3	6



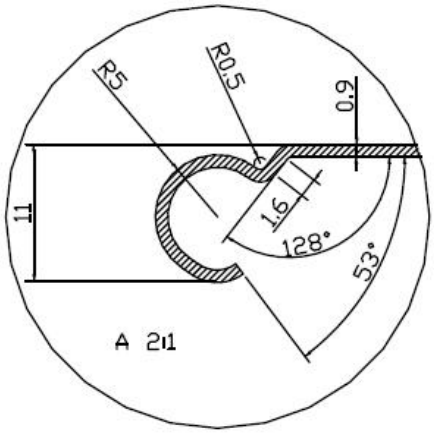


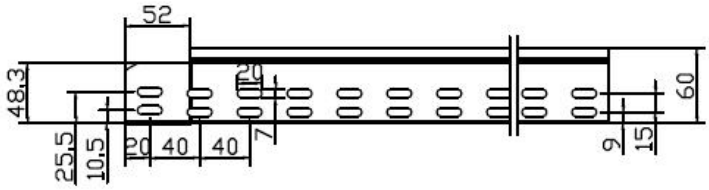
L.p.	Nazwa	Symbol	Materiał	Szt.	Nr katalogowy
2	Śruba z łbem grzybkowym	SGN M6x12		6	
1	Korytko	KSDJ400H60/3		2	

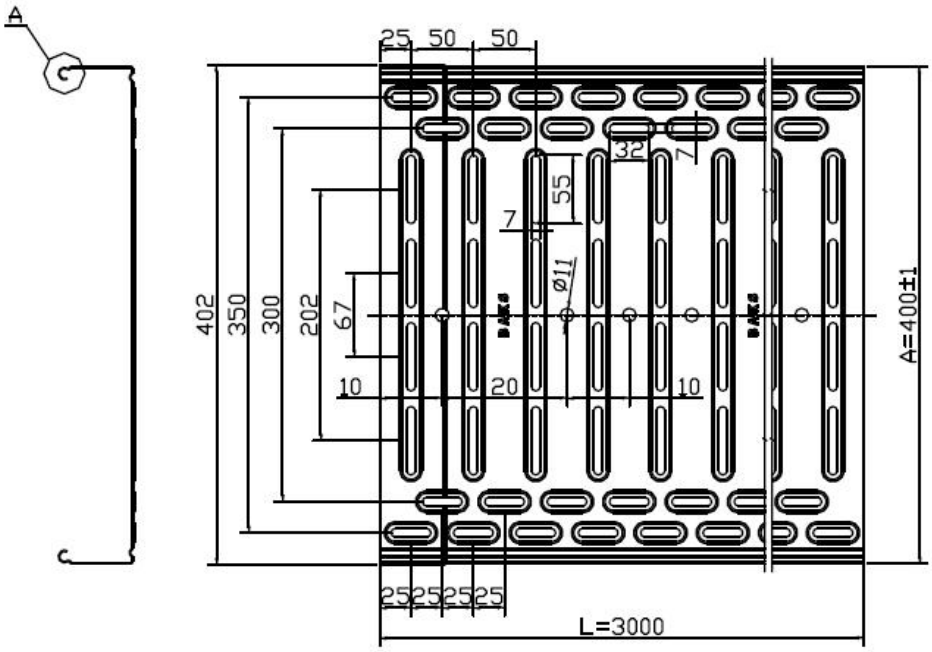
Gatunek
Nr normy
półfabrykat (nr normy)
Masa (kg)
Podziałka
Format A4
Arkusz 1
Arkuszy 1
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
Podpis
Data
Nazwa rysunku
KSDJ400H60/3
Nr zmiany
Nr rysunku

Profesjonalne Systemy Tras Kablowych

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



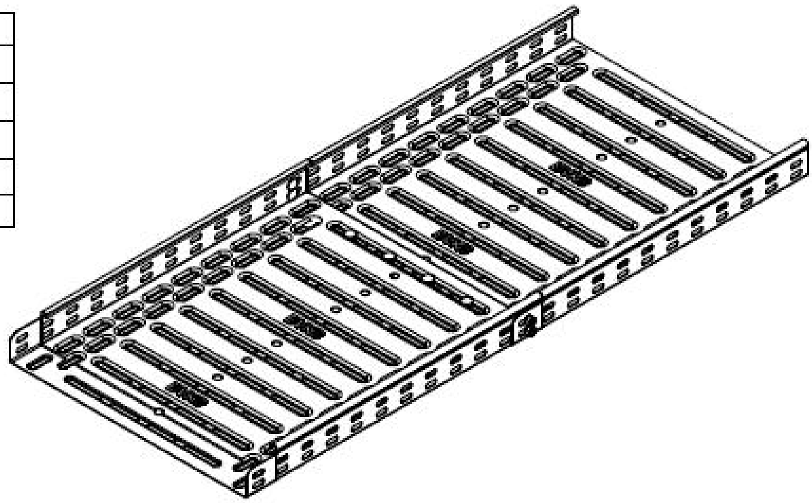


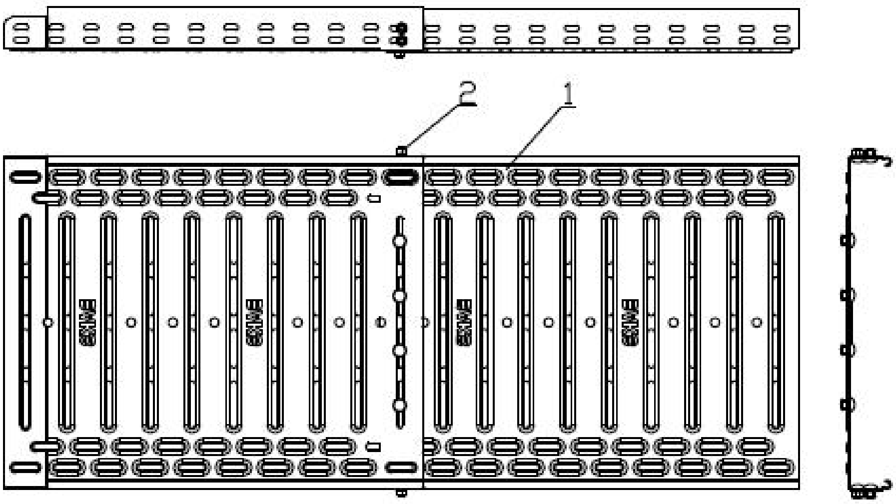


	Dokładność wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 1:5	Format A4
			Nr normy				Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: KGDJ400H60/3			
Rysował							
Sprawdził				Nr programu maszynowego		Nr zmiany	
Zatwierdził				Nr rysunku			

Profesjonalne Systemy Tras Kablowych

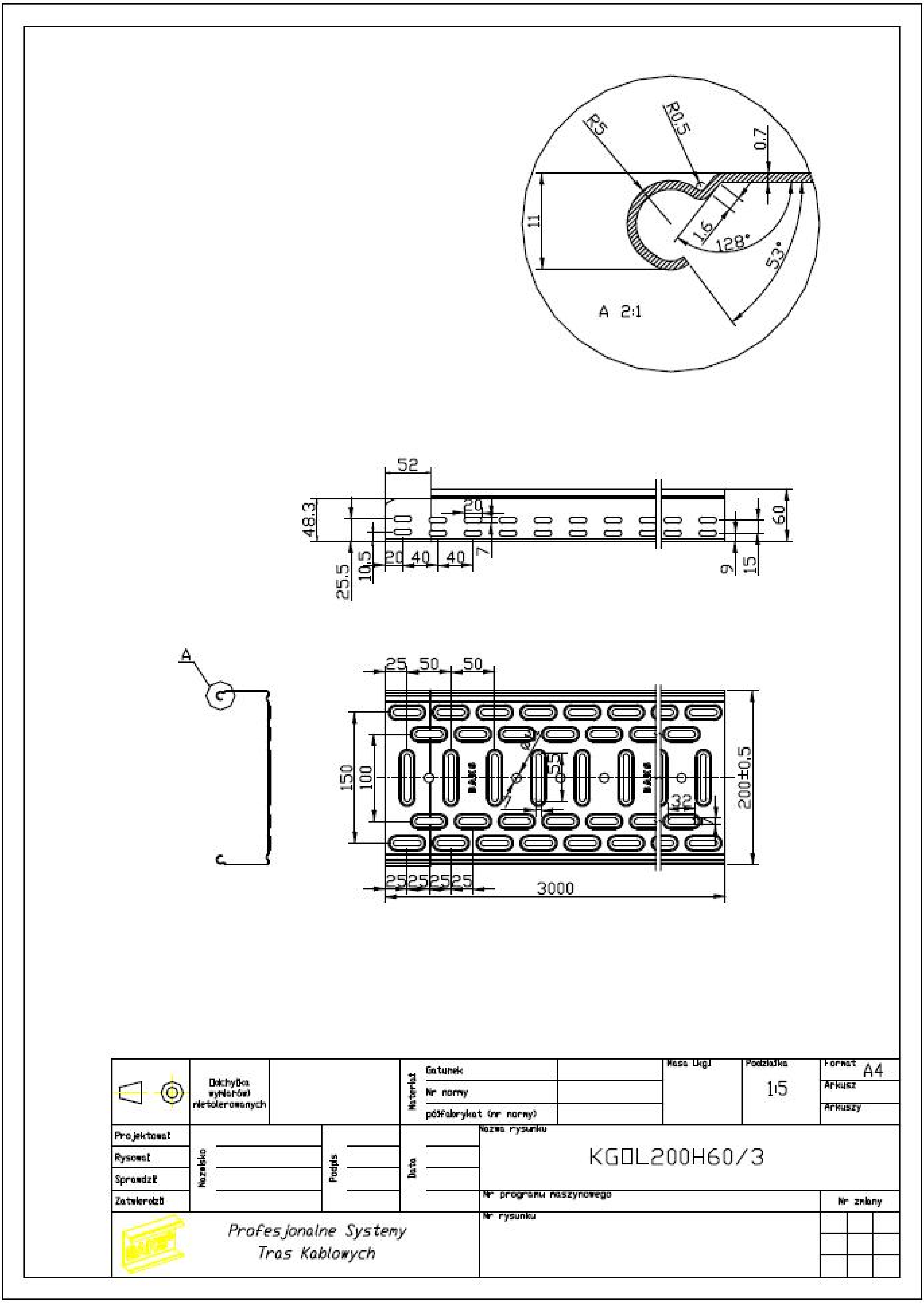
Poz.1		Poz.2
A	Typ	Ilość
100	KGDJ100H60/3	4
200	KGDJ200H60/3	5
300	KGDJ300H60/3	9
400	KGDJ400H60/3	9



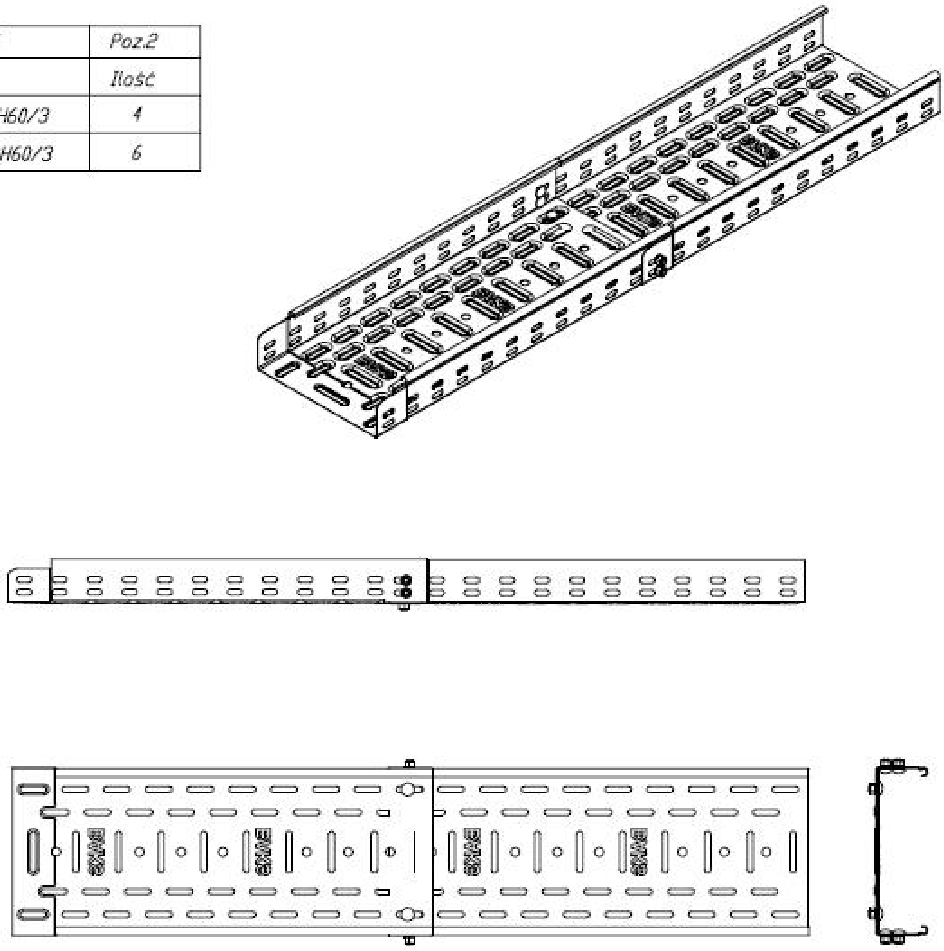


2	Śruba z łbem grzybkowym	SGN M6x12		8	
1	Korytko	KGDJ400H60/3		2	
L.p.	Nazwa	Symbol	Materiał	Szt.	Nr katalogowy

Dokładność wymiarów nietolerowanych		Materiał: Gatunek / Nr normy / półfabrykat (nr normy)	Masa [kg]	Podziałka	Format A4, Arkusz 1, Arkuszy 1
Projektował / Rysował / Sprawdził / Zatwierdził	Nazwisko	Podpis	Data	Nazwa rysunku: KGDJ400H60/3	
Profesjonalne Systemy Tras Kablowych				Nr programu maszynowego / Nr rysunku	Nr zmiany


R5
R0.5
0.7
11
1.6
128°
53°
A 2:1
52
48.3
20
60
7
25.5
10.5
20
40
40
9
15
A
25
50
50
150
100
5.5
32
200±0.5
25
25
25
25
3000
Dokładność wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa [kg]
Podziałka
1:5
Format
A4
Arkusz
Arkuszy
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
Podpis
Data
Nazwa rysunku
KGOL200H60/3
Nr programu maszynowego
Nr zmiany
Nr rysunku
Profesjonalne Systemy
Tras Kablowych

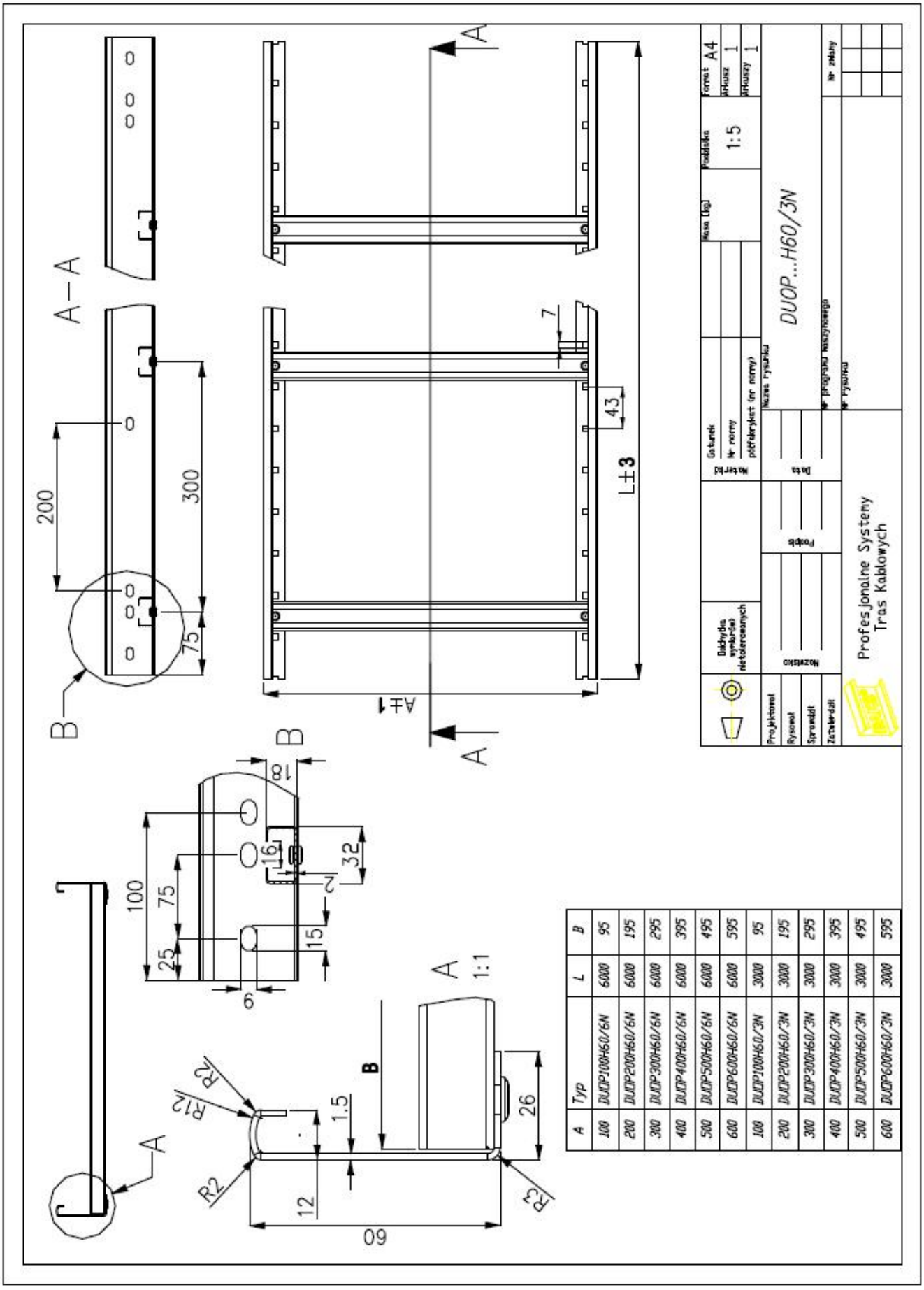
Poz.1		Poz.2
A	Typ	Ilość
100	KGDJ100H60/3	4
200	KGDJ200H60/3	6



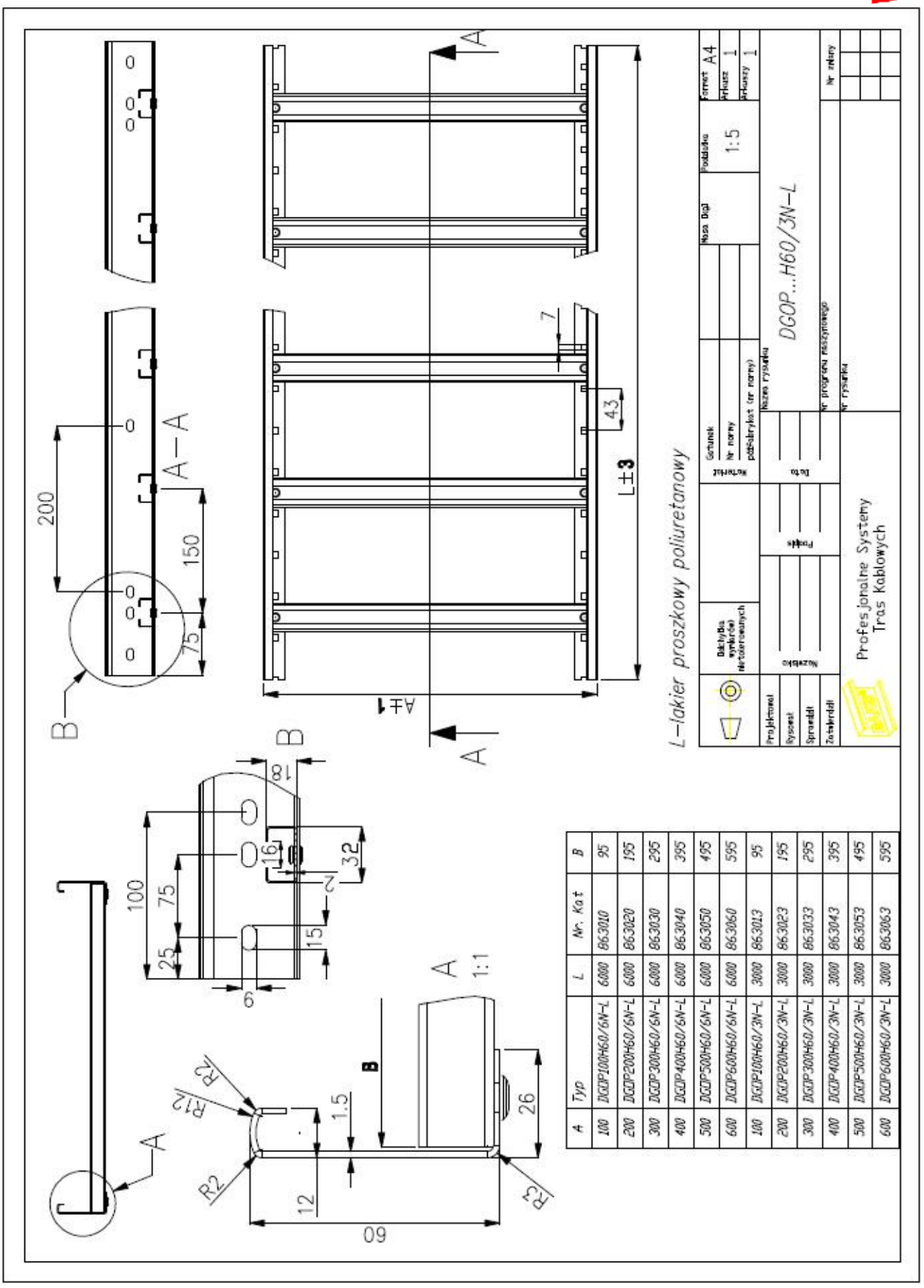
L.p.	Nazwa	Symbol	Materiał	Szt.	Nr katalogowy
2	Śruba z łbem grzybkowym	SGN M6x12		6	
1	Korytko	KGDJ400H60/3		2	

Odchyłka wymiarów nietolerowanych		Materiał: Gatunek / Nr normy / półfabrykat (nr normy)	Masa [kg]	Podziałka
Format A4	Arkusz 1	Arkuszy 1		
Projektował / Rysował / Sprawdził / Zatwierdził	Nazwisko	Podpis	Data	Nazwa rysunku: KGDL200H60/3
Nr programu maszynowego	Nr rysunku	Nr zmiany		

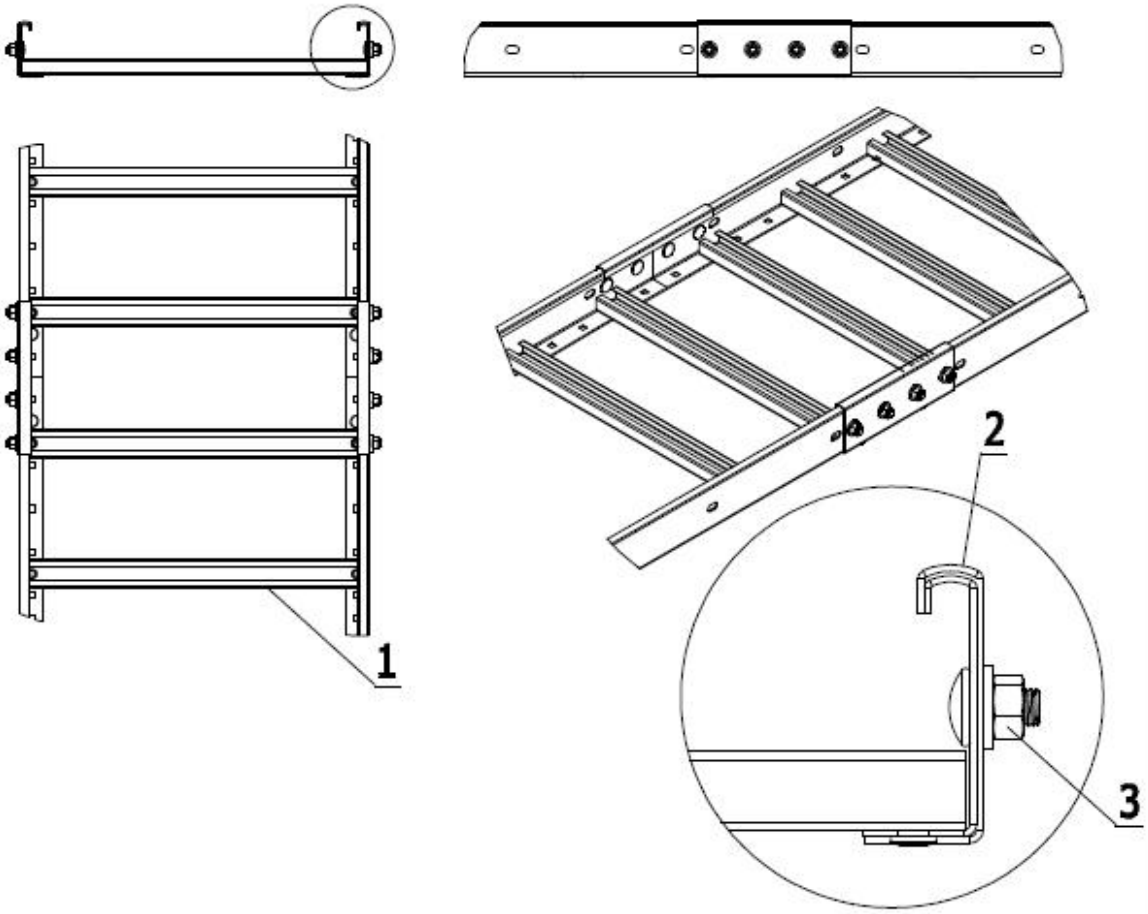
Profesjonalne Systemy Tras Kablowych



A	Typ	L	B
100	DUOP100H60/6N	6000	95
200	DUOP200H60/6N	6000	195
300	DUOP300H60/6N	6000	295
400	DUOP400H60/6N	6000	395
500	DUOP500H60/6N	6000	495
600	DUOP600H60/6N	6000	595
100	DUOP100H60/3N	3000	95
200	DUOP200H60/3N	3000	195
300	DUOP300H60/3N	3000	295
400	DUOP400H60/3N	3000	395
500	DUOP500H60/3N	3000	495
600	DUOP600H60/3N	3000	595



A	Typ	L	Nr. Kat	B
100	DGOP100H60/6N-L	6000	86.3010	95
200	DGOP200H60/6N-L	6000	86.3020	195
300	DGOP300H60/6N-L	6000	86.3030	295
400	DGOP400H60/6N-L	6000	86.3040	395
500	DGOP500H60/6N-L	6000	86.3050	495
600	DGOP600H60/6N-L	6000	86.3060	595
100	DGOP100H60/3N-L	3000	86.3013	95
200	DGOP200H60/3N-L	3000	86.3023	195
300	DGOP300H60/3N-L	3000	86.3033	295
400	DGOP400H60/3N-L	3000	86.3043	395
500	DGOP500H60/3N-L	3000	86.3053	495
600	DGOP600H60/3N-L	3000	86.3063	595



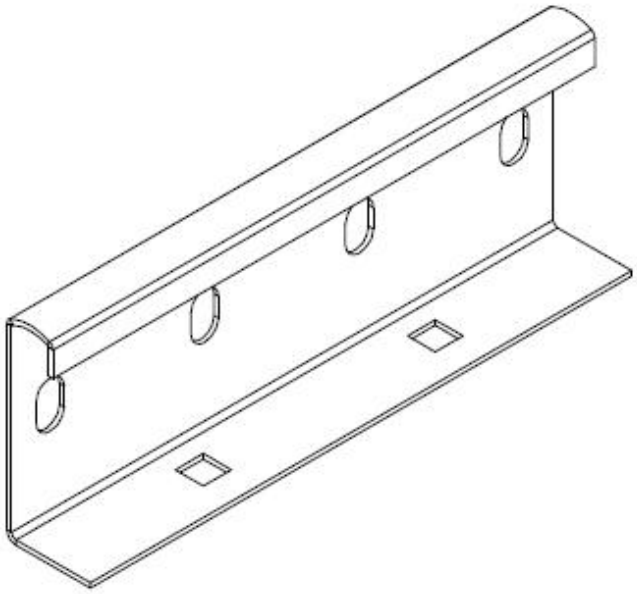
L.P.	Nazwa	Symbol	Materiał	szt.	Nr katalogowy
3	śruba	SGN M8x14		8	
2	łącznik	LDDCH60N-L		2	
1	DRABINA	DGDP400H60/3N-L		2	

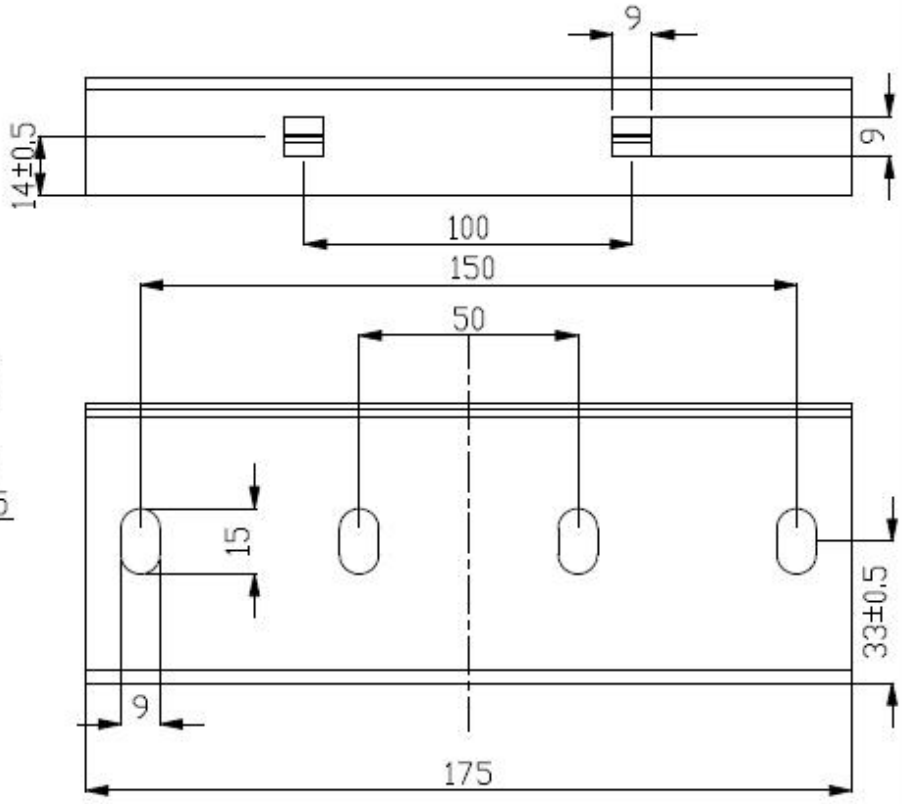
Odchyłka wymiarów nietolerowanych		Materiał	Gatunek		Masa Ogł	Podziałka	Format A4
			Nr normy				Arkusz 1
			polfabrykat (Nr normy)				Arkuszy 1

Projektował	Nazwisko	Podpis	Data	Nazwa rysunku
Rysował	P. Okniński			DGDP400H60/3N-L
Sprawdził				Nr programu maszynowego
Zatwierdził				Nr rysunku

Profesjonalne Systemy Tras Kablowych

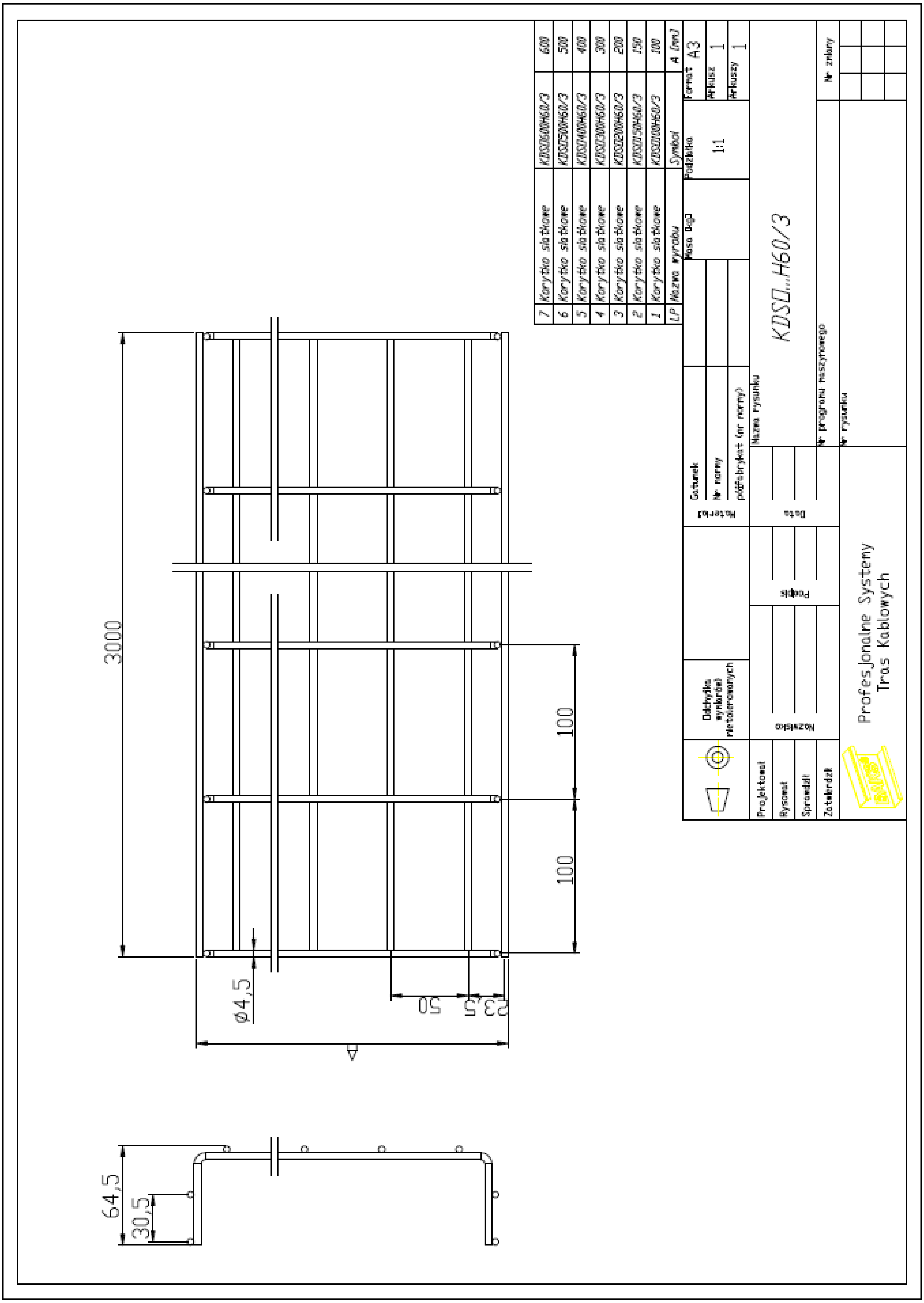
Nr zmiany

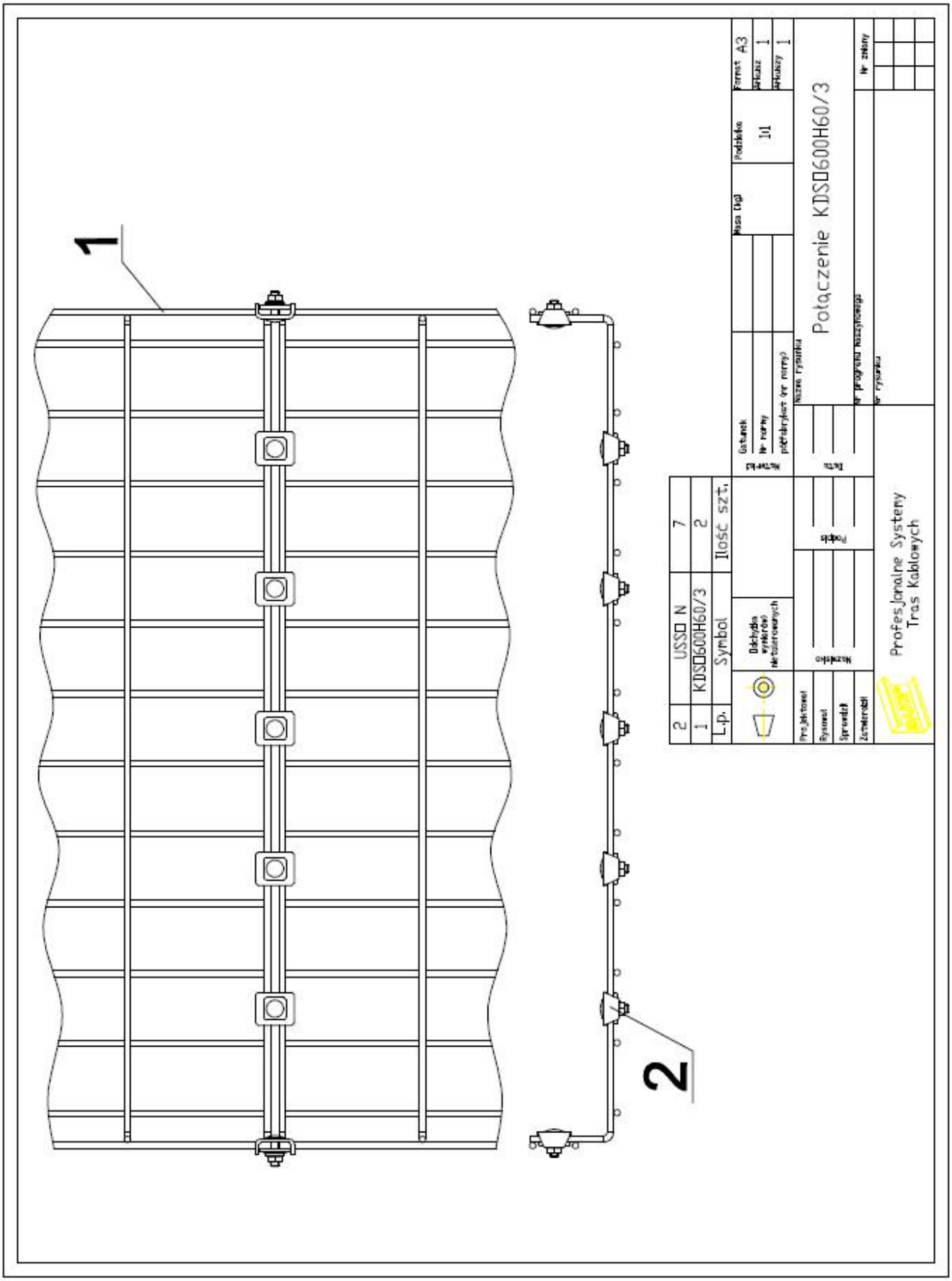


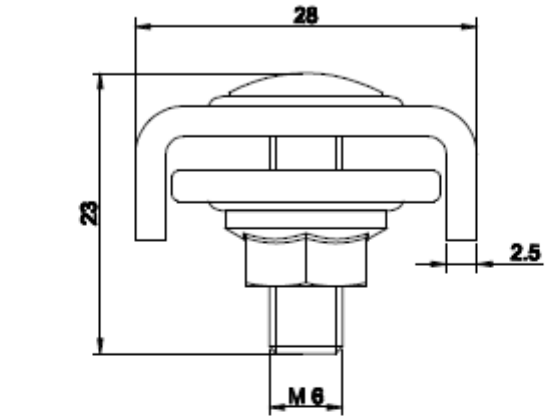


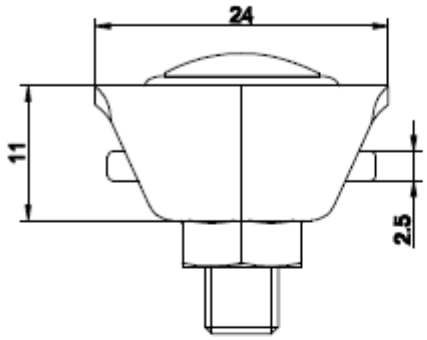
L-lakier proszkowy poliuretanowy

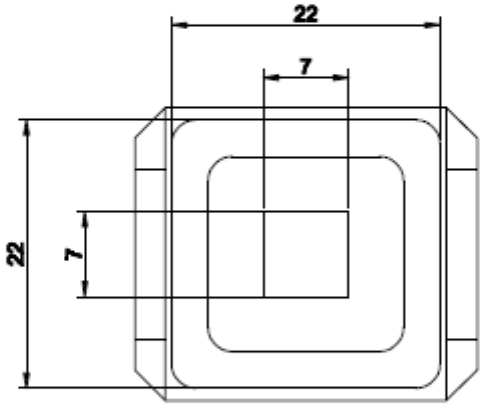
	Odchyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka	Format A4
			Nr normy				Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa Rysunku: LDOCH60N-L			
Rysował							
Sprawdził							
Zatwierdził				Nr programu			Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku			


3000
64,5
30,5
Ø4,5
A
50
23,5
100
100
7 Korytko siatkowe KDS□600H60/3 600
6 Korytko siatkowe KDS□500H60/3 500
5 Korytko siatkowe KDS□400H60/3 400
4 Korytko siatkowe KDS□300H60/3 300
3 Korytko siatkowe KDS□200H60/3 200
2 Korytko siatkowe KDS□150H60/3 150
1 Korytko siatkowe KDS□100H60/3 100
LP Nazwa wyrobu Symbol A [mm]
Odchyłka wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa [kg]
Podziałka
1:1
Format A3
Arkusz 1
Arkuszy 1
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
Podpis
Data
Nazwa rysunku
KDS□...H60/3
Nr programu maszynowego
Nr zmiany
Nr rysunku
Profesjonalne Systemy
Tras Kablowych

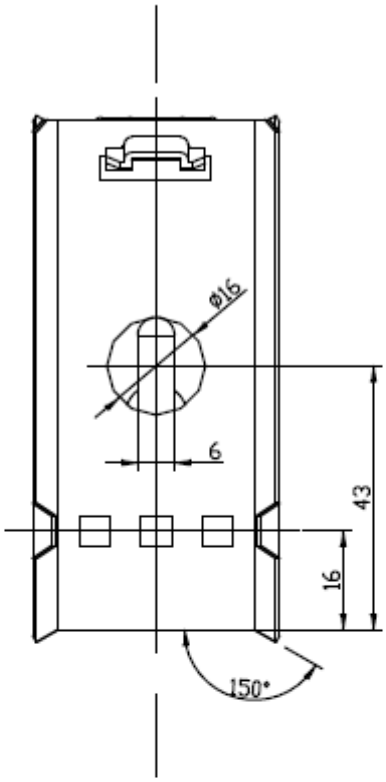

1
2
Połączenie KDSO600H60/3
Profesjonalne Systemy
Tras Kablowych
Lp.
Symbol
Ilość szt.
1
KDSO600H60/3
2
2
USSO N
7

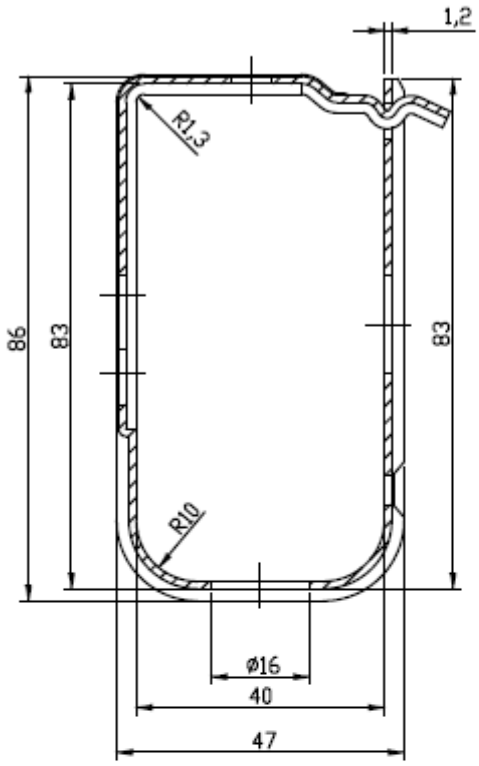


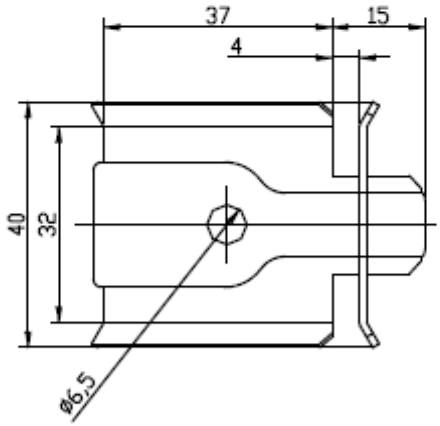




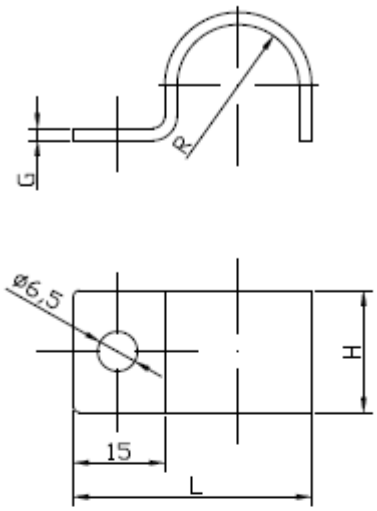
Oddychlka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 2:1	Format A4	
		Nr normy		------		Arkusz 1	
		półfabrykat (nr normy)				Arkuszy 1	
Projektował				Nazwa rysunku: USSO N			
Rysował	Nazwisko: M.Sobolewski	Podpis	Data				
Sprawdził	J.Kilczek						
Zatwierdził	J.Kilczek			Nr programu maszynowego: —		Nr zmiany	
Profesjonalne Systemy Tras Kablowych				Nr rysunku			







Odchyłka wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
			Nr normy				Arkusz 1
			Półfabrykat (nr normy)			1:1	Arkuszy 2
Projektował	T.Grudniewski		2004.12.29	Nazwa rysunku			
Rysował	J.Jasiński	Podpis	2004.12.29	Obejma OZSO			
Sprawdził	J.Kilczek		2004.12.29				
Zatwierdził	K.Sielski		2004.12.29	Nr programu maszynowego			Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku			



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

Dachyłka wymiarów nietolerowanych: ±0,5

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

Masa [kg]: ---

Podziałka: 1:1

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

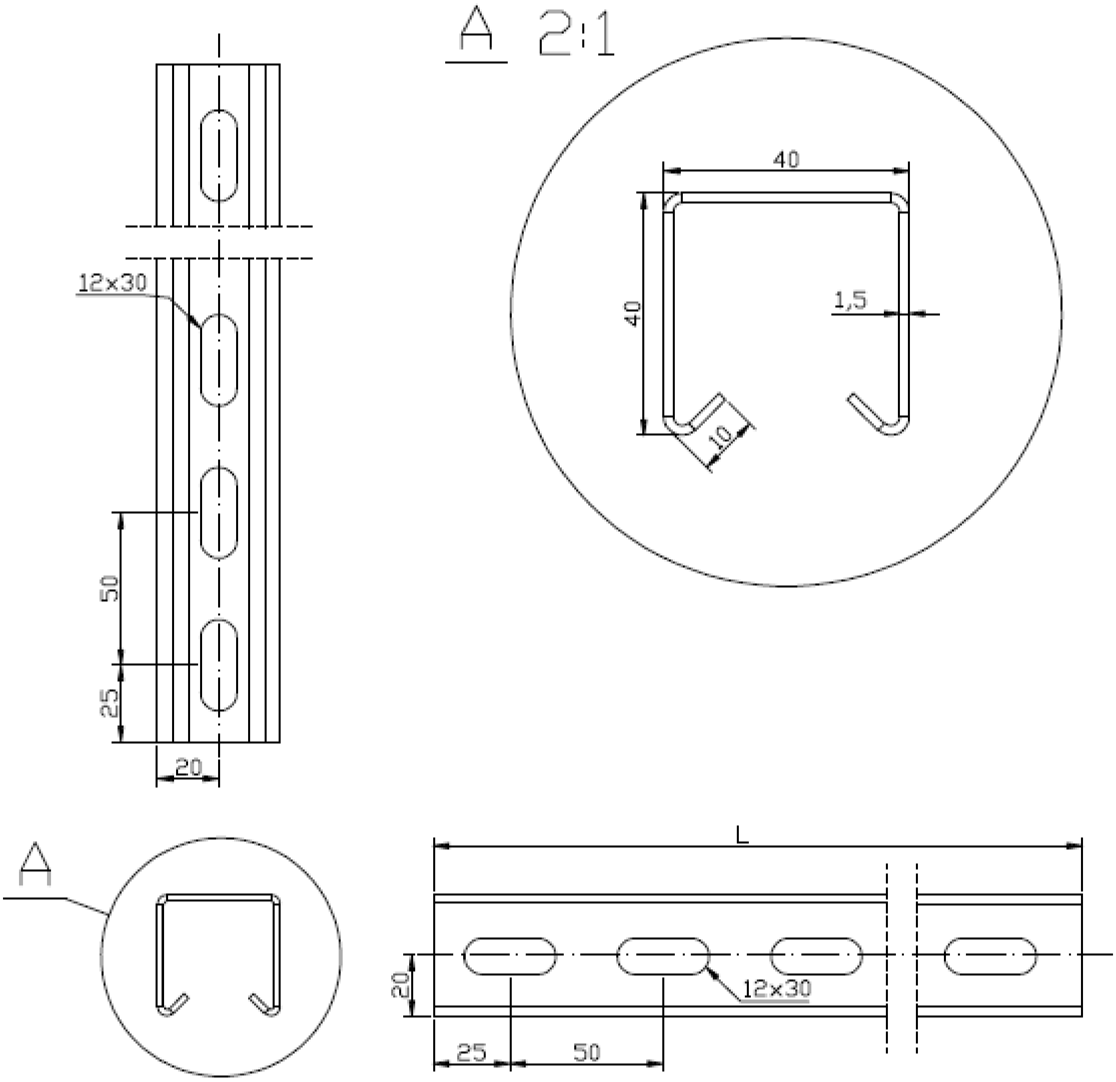
	Nazwisko	Podpis	Data
Projektował	Jacek Grochowski		20.10.05
Rysował	Jakub Rudak		20.02.08
Sprawdził	Jacek Kliczek		20.02.08
Zatwierdził	Jacek Kliczek		20.02.08

Nazwa rysunku: UDF 5-43

Nr zmiany:

Profesjonalne Systemy Tras Kablowych

Nr rysunku: 4055.....



L-lakier proszkowy poliuretanowy

LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	Masa [kg]
5	Ceownik wzmocniony	CWOP40H40/ 2-L		2000	3,50
4	Ceownik wzmocniony	CWOP40H40/05-L		500	0,88
3	Ceownik wzmocniony	CWOP40H40/04-L		400	0,70
2	Ceownik wzmocniony	CWOP40H40/03-L		300	0,53
1	Ceownik wzmocniony	CWOP40H40/02-L		200	0,35

Odchyłka wymiarów nietolerowanych

Grubość (mm): 1,5

Materiał: Gatunek: Blacha stal. cynk. met. Sendzimira; Nr normy: PN-EN 10327:2005; półfabrykat (nr normy): ---

Masa [kg]: ---

Podziałka: 1:1

Format: A4 | Arkusz: -- | Arkuszy: --

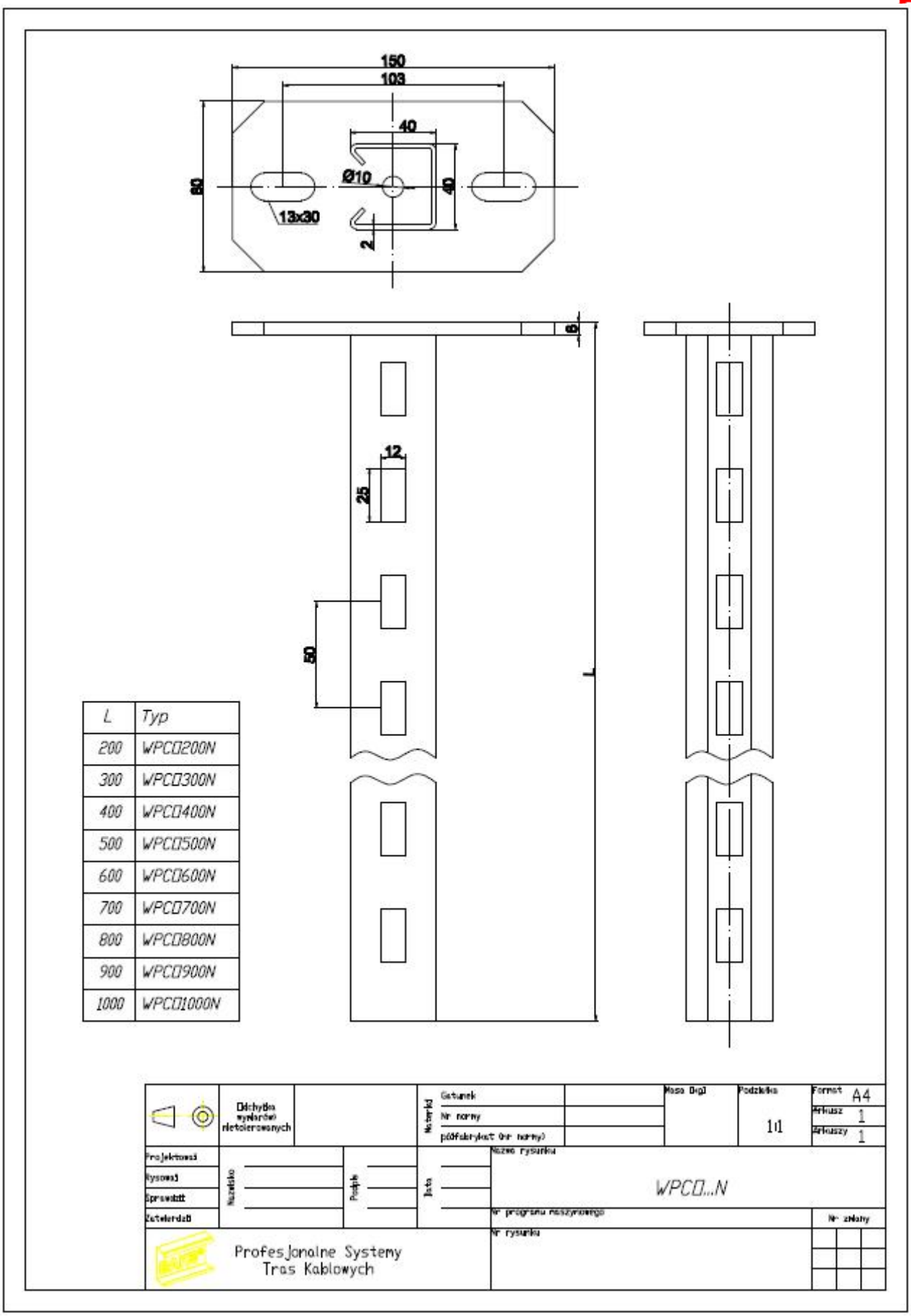
	Nazwisko	Podpis	Data
Projektował	Jacek Grochowski		
Rysował	Jakub Rudak		
Sprawdził	Jacek Kliczek		
Zatwierdził	Jacek Kliczek		

Nazwa rysunku: CWOP40H40/...L

Nr zmiany

Nr rysunku

Profesjonalne Systemy Tras Kablowych



L	Typ
200	WPCO200N
300	WPCO300N
400	WPCO400N
500	WPCO500N
600	WPCO600N
700	WPCO700N
800	WPCO800N
900	WPCO900N
1000	WPCO1000N

Odchylka wymiarów nietolerowanych

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

Masa (kg) | Podziałka: 1:1 | Format: A4 | Arkusz: 1 | Arkuszy: 1

Projektował | Rysował | Sprawdził | Zatwierdził

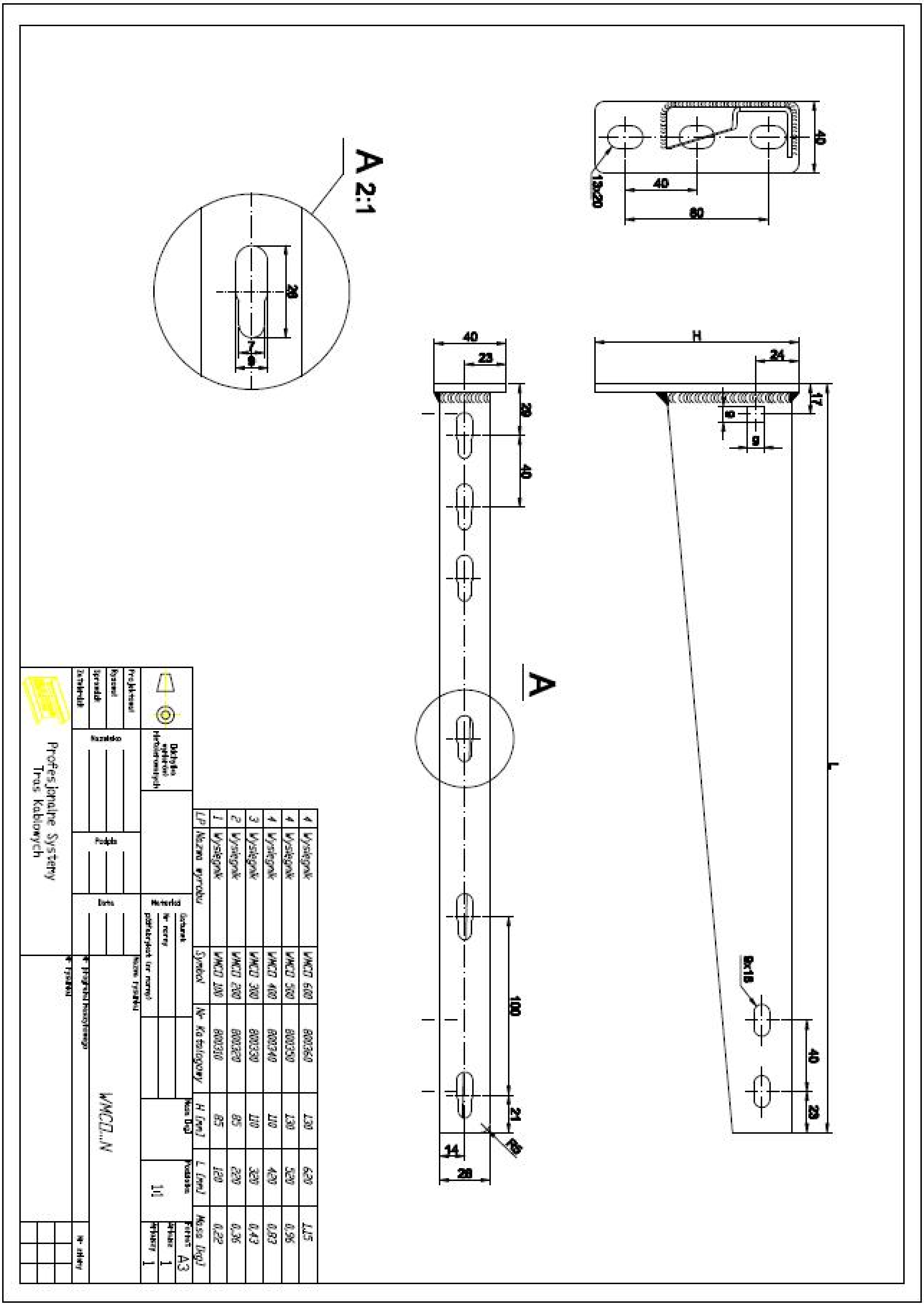
Nazwisko | Podpis | Data

Nazwa rysunku: WPCO...N

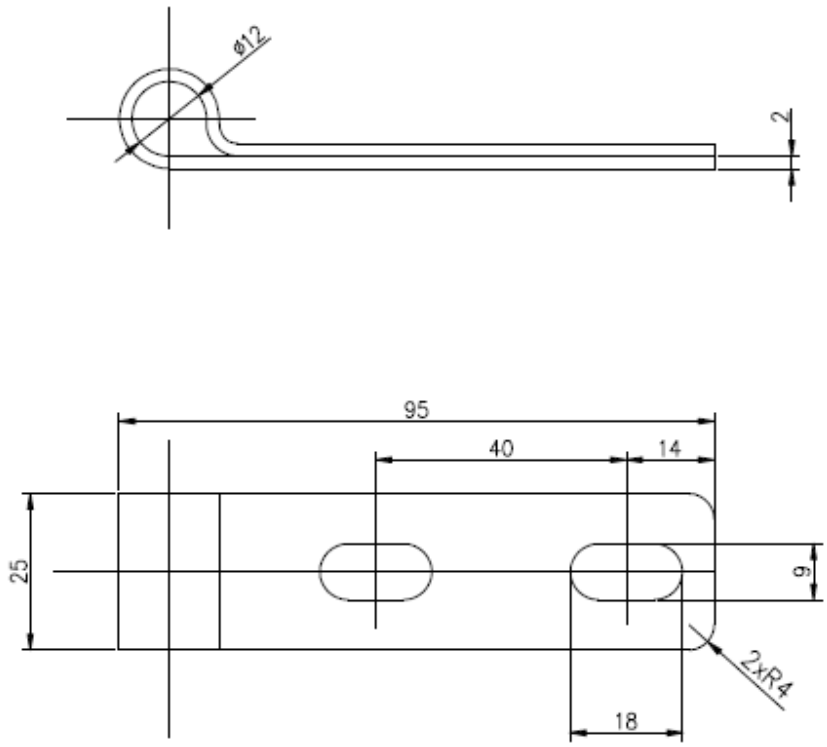
Nr projektu roboczego | Nr zmiany

Profesjonalne Systemy Tras Kablowych

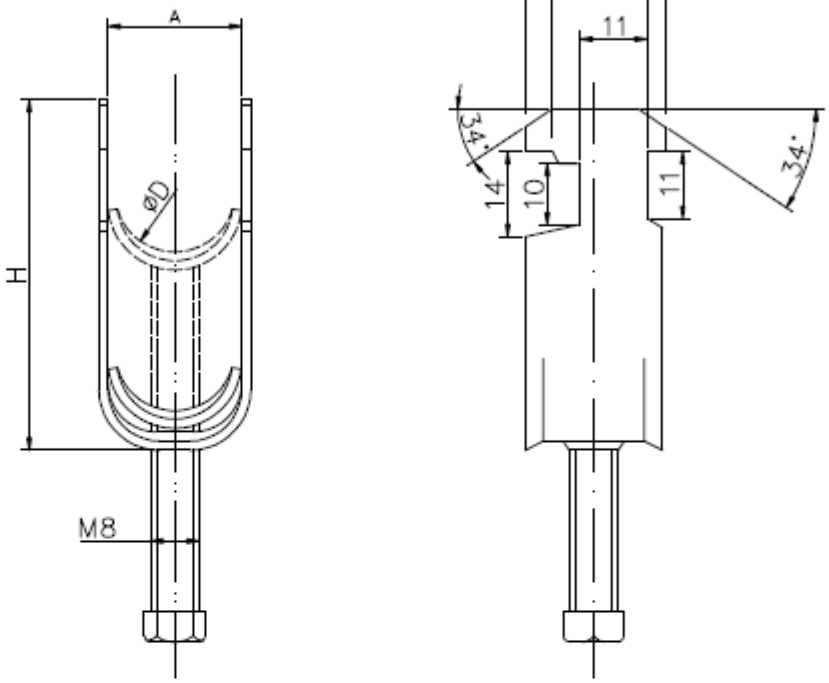
Nr rysunku



LP	Nazwa wyrobu	Symbol	Nr Katalogowy	H [mm]	L [mm]	Masa [kg]
1	Wysięgnik	WMCD 100	800310	85	120	0,22
2	Wysięgnik	WMCD 200	800320	85	220	0,36
3	Wysięgnik	WMCD 300	800330	110	320	0,43
4	Wysięgnik	WMCD 400	800340	110	420	0,83
4	Wysięgnik	WMCD 500	800350	130	520	0,96
4	Wysięgnik	WMCD 600	800360	130	620	1,15



	Odchyłka wymiarów nietolerowanych		Materiał: Gatunek / Nr normy / półfabrykat (Nr normy)		Masa [kg] ---	Podziałka 1:1	Format A4 / Arkusz 1 / Arkuszy 1
Projektował	JGrochowski	Podpis	Data	Nazwa rysunku: UPW0			
Rysował	JGrochowski						
Sprawdził	JKilczek						
Zatwierdził	JKilczek			Nr programu maszynowego ---			Nr zmiany
BAKS Profesjonalne Systemy Tras Kablowych				Nr rysunku			



UK01/64–70	72	116	70
UK01/58–64	66	103	64
UK01/46–52	54	97	52
UK01/40–46	48	86	46
UK01/34–40	42	78	40
UK01/28–34	36	71	34
UK01/22–28	30	61	28
UK01/16–22	24	57	22
SYMBOL	A	H	ØD

Dachówka wyrównawcza nietolerowanych

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

Masa [kg]: ----

Podziałka: -- 1:1

Format: A4; Arkusz: 1; Arkuszy: 1

Projektował; Rysował; Sprawdził; Zatwierdził

Nazwisko; Podpis; Data

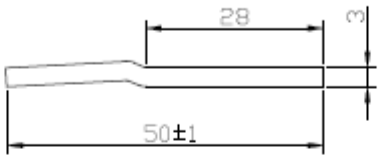
Nazwa Rysunku: UK01

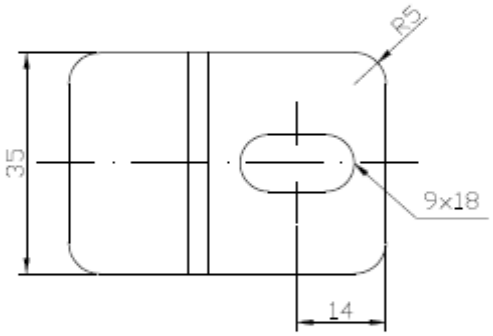
Nr programu maszynowego: ---

Nr zmiany

Nr Rysunku

Profesjonalne Systemy Tras Kablowych



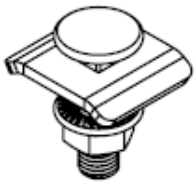


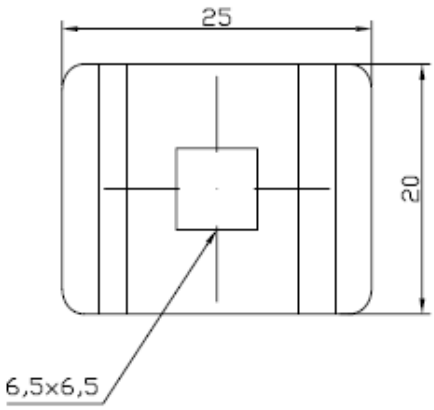
	Odchyłka wymiarów nietolerowanych	±0,5	Materiał: Gatunek	-----	Masa [kg]	Podziałka	Format	A4
			Nr normy	PN-EN 10327:2005	0,025	1:1	Arkusz	--
			półfabrykat (nr normy)	-----			Arkuszy	--

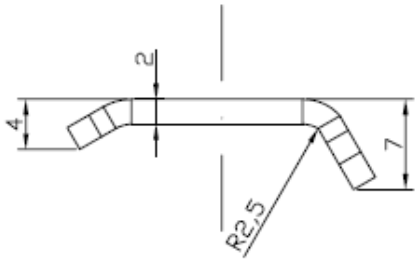
	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	Tomasz Grudniewski		29.12.04	ZMO
Rysował	Jakub Rudak		20.02.08	
Sprawdził	Jacek Kliczek		20.02.08	
Zatwierdził	Jacek Kliczek		20.02.08	Nr zmiany

Profesjonalne Systemy Tras Kablowych

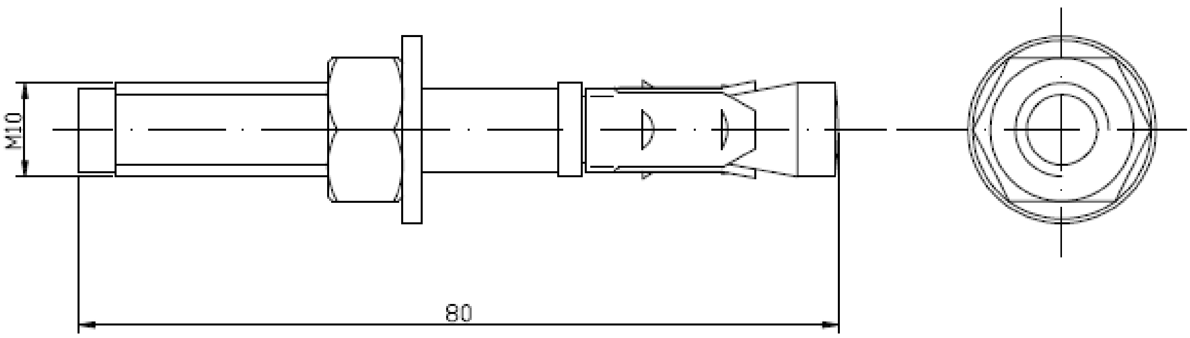
Nr rysunku 802900



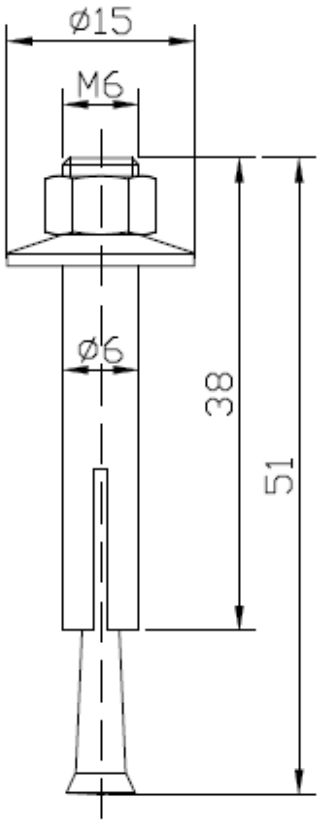




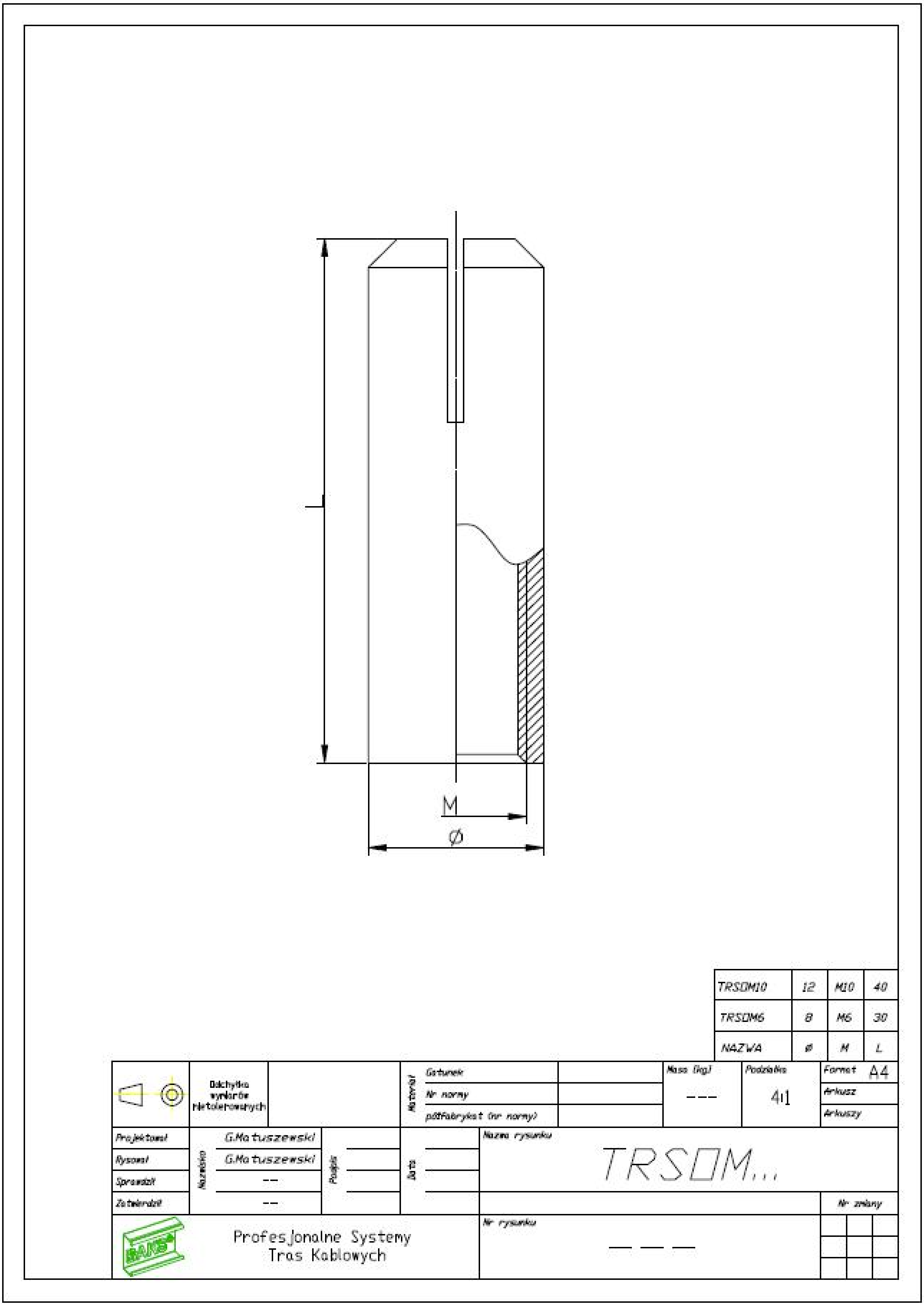
	Odchyłka wymiarów nietolerowanych	±0,5	Materiał: Gatunek	-----	Masa (kg)	Podziałka	Format	A4
			Nr normy	PN-EN 10327:2005	0,07	2:1	Arkusz	--
			półfabrykat (nr normy)	-----			Arkuszy	--
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku				
Rysował	Jakub Rudak		20.02.08	ZSO				
Sprawdził	Jacek Kliczek		20.02.08					
Zatwierdził	Jacek Kliczek		20.02.08				Nr zmiany	
BAKS	Profesjonalne Systemy Tras Kablowych			Nr rysunku 806100				



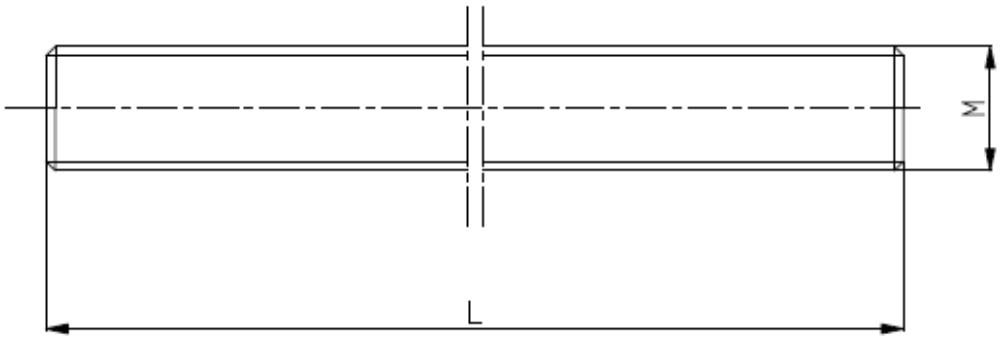
Odchyłka wymiarów nietolerowanych	Materiał	Gatunek: Stal cynkowana galwanicznie	Masa [kg]	Podziałka 1:1
		Nr normy		Format A4
		półfabrykat (nr normy)		Arkusz / Arkuszy
Projektował	J.GROCHOWSKI	20.10.05	Nazwa rysunku	
Rysował	J.Grochowski	20.10.05	PSRDM10x80	
Sprawdził	T.WLODARCZYK	20.10.05		
Zatwierdził	J.KLICZEK	20.10.05		Nr zmiany
BAKS	Profesjonalne Systemy Tras Kablowych		Nr rysunku 804100	



Materiał: Gatunek: stal kwasoodporna; Nr normy; pokrycie (nr normy)	Masa [kg]: ---	Podziałka: 2:1	Format: A4; Arkusz; Arkuszy			
Projektował; Rysował; Sprawdził; Zatwierdził	Nazwisko: G.Matuszewski	Podpis	Data: 29.01.09	Nazwa rysunku: SRØM6x30 Śruba rozporowa		Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku: — — —		


M
Ø
TRSDM10 12 M10 40
TRSDM6 8 M6 30
NAZWA Ø M L
Odchyłka wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa (kg)

Podziałka
4:1
Format A4
Arkusz
Arkuszy
Projektował G.Matuszewski
Rysował G.Matuszewski
Sprawdził --
Zatwierdził --
Nazwisko
Podpis
Data
Nazwa rysunku
TRSDM...
Nr zmiany
Nr rysunku
— — —
Profesjonalne Systemy Tras Kablowych



Symbol	Gwint M[mm]	Długość L[mm]
PGM10/1	M10	1000
PGM8/1	M8	1000
PGM6/1	M6	1000

Odchyłka wymiarów nietolerowanych		Materiał: Gatunek	5,8	Masa [kg]	Podziałka 2:1	Format A4	
		Nr normy	———	---		Arkusz 1	
		półfabrykat (Nr normy)				Arkuszy 1	
Projektował	JGRODKOWSKI		20.10.15	Nazwa rysunku: PGM.../1			
Rysował	JGrochowski		20.10.15				
Sprawdził	T.WŁODARCZYK		20.10.15				
Zatwierdził	J.KLICZEK		20.10.15	Nr programu maszynowego ---		Nr zmiany	
Profesjonalne Systemy Tras Kablowych				Nr rysunku			

7. FINAL PROVISION

§ This report details the method of construction, the test conditions and results obtained when the specific element of construction described herein was following the procedure outlined in STN EN 1363-1, and where appropriate DIN 4102 - 2 and DIN 4102 - 12. 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:

Miroslav Hudák
technician of the testing laboratory

8. NORMATIVE REFERENCES

STN EN 1363-1: 2001	Fire resistance tests. Part 1: General requirements
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

THE END OF THE TEST REPORT