TEST REPORT FIRES-FR-242-13-AUNE

Power and communication cables of Berica cavi S. p. A. at cable bearing system OBO Bettermann

Reg. No. 041/S-159

The Experts on Fire Safety

TEST REPORT

FIRES-FR-242-13-AUNE

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

Name of the product:	Power and communication cables of Berica cavi S. p. A. at cable bearing system OBO Bettermann
Manufacturer:	Berica cavi S. p. A., Via della Meccanica 2, Meledo di Sarego (Vicenza) 360 40, Italy (producer of cables) OBO Bettermann GmbH&Co., Hüinser Ring 52, D-58694 Menden, Germany (producer of cable bearing system)
Sponsor:	Berica cavi S. p. A., Via della Meccanica 2, Meledo di Sarego (Vicenza) 360 40, Italy

Test carried out:	Fires, s.r.o., Testing laboratory
Task No.:	PR-13-0489
Specimens received:	04. 12. 2013
Date of the test:	12. 12. 2013

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

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1. INTRODUCTION

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

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

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

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

Representatives from the sponsor's side witnessing the test:

Mr. Alessandro Pristerà	Berica cavi S.p.A., Italy
Dott. Giorgio Levi	Berica cavi S.p.A., Italy
test directed by	Ing. Marek Gorlický
test carried out by	Bc. Dávid Šubert
operator	Miroslav Hudák

2. MEASURING EQUIPMENT

Identification number	Measuring equipment	Note
F 90 004	Vertical test furnace for fire resistance testing	-
F 69 010	PLC system for data acquisition and control TECOMAT TC 700	-
F 40 017	Control and communication software to PLC TECOMAT TC 700	-
F 40 018	SW Reliance	-
F 40 019	Visual and calculating software to PLC TECOMAT TC 700	-
F 40 020	Driver Tecomat – Reliance (SW)	-
F 69 009	PLC system for data acquisition and climate control TECOMAT TC 604	-
F 60 001 - F 60 009	Sensors of temperature and relative air humidity	climatic conditions measuring
F 71 008, F 71 009	Transducer of differential pressure (–50 to + 150) Pa	pressure inside the test furnace
F 10 521 - F 10 528	Plate thermometers	temperature inside the test furnace, according to EN 1363-1
F 10 701	Sheathed thermocouple type K Ø 3 mm	ambient temperature

Identification number	Measuring equipment	Note
F 54 020	Digital calliper (0 to 200) mm	-
F 54 056	Racking meter	-
F 57 007	Digital stop-watch	-
F 96 015	Test signal panel	-

3. PREPARATION OF THE SPECIMENS

Testing laboratory didn't take off individual components of the specimens. Components take-off and its delivering to the testing laboratory were carried out by the test sponsor. Assembling of the supporting system into the test furnace and mounting of cables and weights into the supporting system was carried out by workers of laboratory under supervision of laboratory technician.

4. PREPARATION OF THE TEST

4.1 DESCRIPTION OF THE SPECIMENS STRUCTURE

Test specimen comprised from power and communication halogen free cables of company Berica cavi S. p. A. at cable bearing system OBO Bettermann company – cable trays, ladders and cable clips with accessories (consoles, supports, hangers etc.).

Cables

Used cables by test:

(N)HXH FE180/E30 4x1,5	(8x)
(N)HXH FE180/E30 4x25	(8x)
EUROSAFE FE180 UNSCREENED 4x0,5	(8x)
EUROSAFE FE180 UNSCREENED 4x2,5	(8x)
EUROSAFE JE-H(St)H 1x2x0,8	(8x)
EUROSAFE JE-H(St)H 1x2x0,9	(8x)

The length of cables was 3,5 m and 3,1 m from that was exposed to fire.

Cable bearing systems were made of following constructions:

Suspension tracks No. 1 - 3

Tracks are made of consoles (US 3 K) fixed to ceiling by two threaded rods (2078/M10) in spacing of 1200 mm. Brackets (MWA 12 31) are fixed to consoles by screws (FRS M10x25) with washers and nuts. Cable trays are fixed through the holders by threaded rods M10 with washers and nuts to ceiling clamps (BSB).

Cable trays (SKS 630, steel sheet thickness 1,5 mm) are fixed together by two junctions (RWVL60) on sides and one junction (SSLB300) on the bottom and by screws (FRSB M6x15). Holders (ABR) are fixed at the trays near each bracket (≤ 100 mm). Trays are fixed to supports by screws (FRSB M6x15) and loaded with 10kg.m^{-1}. Cables are fixed to cable trays by single cable clips (type 1015).

Ceiling track No. 4

Track is made of ceiling profiles (1268L) fixed to ceiling by threaded rods M6 with washers and nuts. Cables are fixed to profiles by single cable clips (type 732) in spacing of 300 mm.

Ceiling track No. 5

Track is made of ceiling profiles (1268L) fixed to ceiling by threaded rods M6 with washers and nuts. Cables are fixed to profiles by cable clips (type 2056M) with troughs (type 2058 LW, 200 mm long) in spacing of 600 mm.

Suspension tracks No. 6 - 8
Tracks are made of consoles (US 3 K) fixed to ceiling by two threaded rods (2078/M10) in spacing of 1200 mm. Brackets (MWA 12 41) are fixed to consoles by screws (FRS M10x25) with washers and nuts. Cable ladders are fixed through the holders by threaded rods M12 with washers and nuts to ceiling clamps (BSB).

Cable ladders (LG 640 VS/F, steel sheet thickness 1,5 mm, spacing of transoms 300 mm) are fixed together by two junctions (AVL 60) with screws (FRSB M8x16). Holders (ABL) are fixed at the ladders near each bracket (≤ 100 mm). Ladders are fixed to brackets by clamping pieces (LKS 40) and loaded with 20kg.m^{-1}. Cables are fixed to cable ladders by single cable clips (type 2056M).

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

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

4.2 DESCRIPTION OF SPECIMENS FIXATION

The test specimens were fixed on the ceiling of the test furnace which was created from aerated concrete panels with dimensions (4000 x 600 x 240) mm – 6 pieces and fixed to side walls made of aerated concrete blocks YTONG, 250 mm thick. Ceiling panels were jointed by beam which provides balance deflection of the ceiling.
The type of specimen's fixation into the test furnace is shown in drawing documentation and it was selected by the sponsor.

4.3 INSPECTION OF SPECIMENS

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

4.4 CLIMATIC CONDITIONING OF SPECIMENS

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

Ambient air temperature [°C]

mean	18,7
standard deviation	1,0

Relative air humidity [%]

mean	44,4
standard deviation	2,3

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

5. CARRYING OUT OF THE TEST

5.1 TEST GENERALLY

The test was carried out in horizontal test furnace with dimensions of (3100 x 3000 x 2750) mm (length x width x height).

5.2 CONDITIONS OF THE TEST

Conditions in the test furnace (temperature – standard temperature/time curve, pressure, content of O_2) as well as in the testing room (ambient temperature) corresponded to EN 1363-1 during the test. Detailed information is part of this test report, or in Quality records of the testing laboratory.

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

Date of the test	Relative air humidity [%]	Ambient air temperature [°C]
12. 12. 2013	46,8	18,6

5.3 RESULTS OF THE TEST

Measured values are stated in this test report.
During the test there was no failure or damage of tracks – even during cooling down of the tracks after termination of the test.

6. CLOSING

Evaluation of the test:

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
1	2 cables EUROSAFE FE180 UNSCREENED 4x2,5	**6**	57 minutes
2	2 cables EUROSAFE FE180 UNSCREENED 4x0,5		55 minutes
3	2 cables (N)HXH FE180/E30 4x25	**7**	51 minutes
4	2 cables (N)HXH FE180/E30 4x1,5		44 minutes
5	2 cables (N)HXH FE180/E30 4x25	**5**	62 minutes
6	2 cables (N)HXH FE180/E30 4x1,5		58 minutes
7	cable EUROSAFE FE180 UNSCREENED 4x2,5		89 minutes
8	cable EUROSAFE FE180 UNSCREENED 4x2,5		89 minutes
9	cable EUROSAFE FE180 UNSCREENED 4x0,5		86 minutes
10	cable EUROSAFE FE180 UNSCREENED 4x0,5		89 minutes
11	cable (N)HXH FE180/E30 4x25	**4**	90 minutes no failure / interruption
12	cable (N)HXH FE180/E30 4x25		59 minutes
13	cable (N)HXH FE180/E30 4x1,5		54 minutes
14	cable (N)HXH FE180/E30 4x1,5		52 minutes
15	cable EUROSAFE FE180 UNSCREENED 4x2,5		90 minutes no failure / interruption
16	cable EUROSAFE FE180 UNSCREENED 4x2,5		90 minutes no failure / interruption
17	cable EUROSAFE FE180 UNSCREENED 4x0,5		90 minutes no failure / interruption
18	cable EUROSAFE FE180 UNSCREENED 4x0,5		90 minutes no failure / interruption
19	cable EUROSAFE FE180 UNSCREENED 4x2,5	**1**	54 minutes
20	cable EUROSAFE FE180 UNSCREENED 4x2,5		54 minutes
21	cable EUROSAFE FE180 UNSCREENED 4x0,5		81 minutes
22	cable EUROSAFE FE180 UNSCREENED 4x0,5		78 minutes
23	cable (N)HXH FE180/E30 4x25	**2**	58 minutes
24	cable (N)HXH FE180/E30 4x25		48 minutes
25	cable (N)HXH FE180/E30 4x1,5		43 minutes
26	cable (N)HXH FE180/E30 4x1,5		48 minutes
52	2 cables EUROSAFE JE-H(St)H 1x2x0,9	**7**	81 minutes
53	2 cables EUROSAFE JE-H(St)H 1x2x0,8	**8**	71 minutes

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
54	2 cables EUROSAFE JE-H(St)H 1x2x0,8	**5**	51 minutes
55	2 cables EUROSAFE JE-H(St)H 1x2x0,9		59 minutes
56	2 cables EUROSAFE JE-H(St)H 1x2x0,8	**4**	75 minutes
57	2 cables EUROSAFE JE-H(St)H 1x2x0,9		85 minutes
58	2 cables EUROSAFE JE-H(St)H 1x2x0,9	**2**	84 minutes
59	2 cables EUROSAFE JE-H(St)H 1x2x0,8	**3**	75 minutes

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

Specimens S1 – S26 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S59 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.

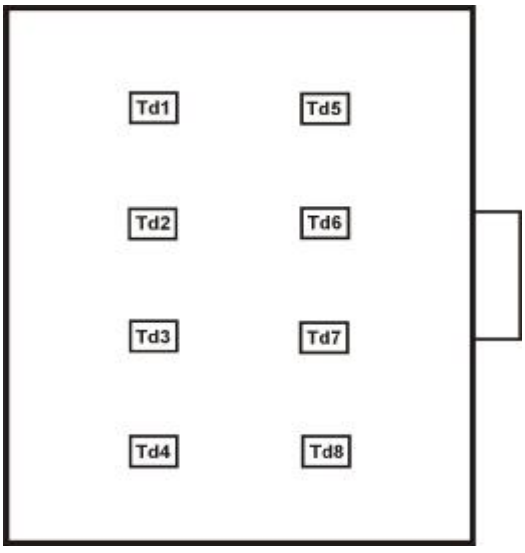
Circuit breakers with rating 3 A were used.

Measured values inside the test furnace

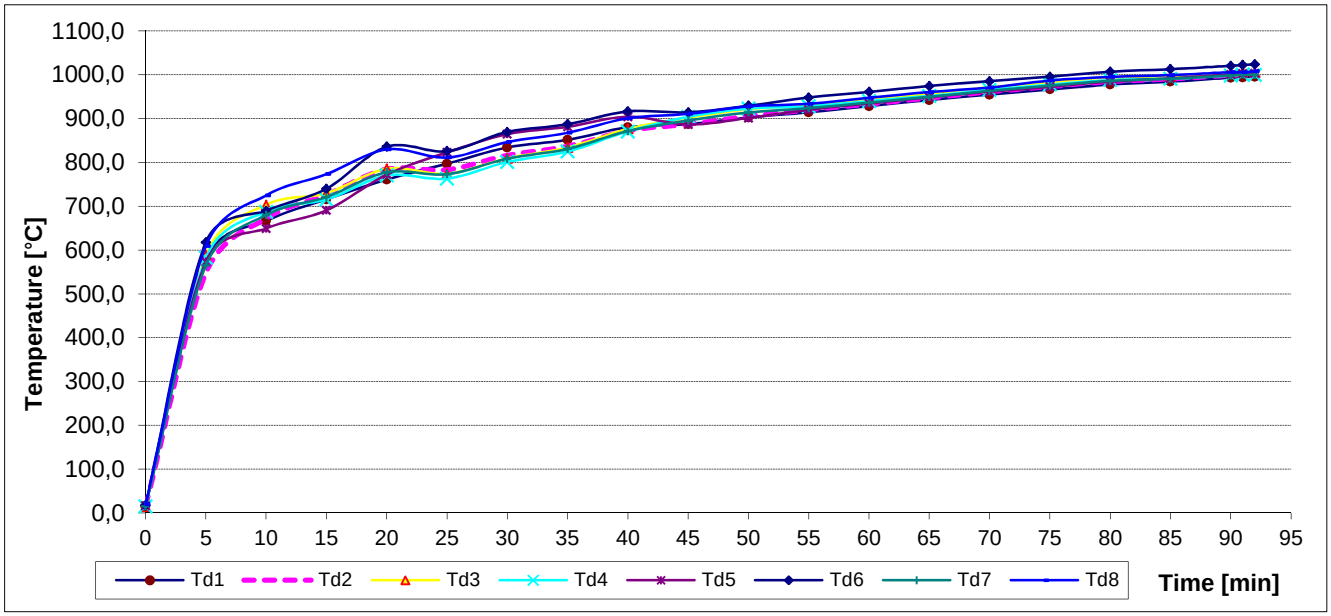
Time	Temperature [°C]											Deviation	Pressure
t [min]	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To	d_e [%]	p [Pa]
0	15,5	14,8	14,1	14,8	16,6	17,2	14,8	19,1	15,9	20,0	18,6	0,0	2,8
5	579,3	547,1	588,5	582,5	573,3	617,9	564,8	609,0	582,8	576,0	18,7	-2,3	18,6
10	666,4	672,0	703,3	687,4	649,2	689,6	679,7	724,6	684,0	678,0	18,7	-0,5	18,9
15	715,9	726,4	729,8	715,8	690,7	739,9	721,1	773,2	726,6	739,0	18,8	-0,5	17,6
20	760,9	784,6	785,5	770,2	772,3	835,9	777,4	829,8	789,6	781,0	18,8	-0,1	17,6
25	797,1	783,1	774,2	763,1	822,8	825,7	773,1	811,1	793,8	815,0	18,9	-0,8	17,7
30	834,0	816,2	809,5	801,1	864,5	869,4	808,7	846,4	831,2	842,0	18,9	-1,0	19,9
35	851,5	836,8	833,9	825,0	881,2	887,0	830,9	867,6	851,7	865,0	19,0	-1,1	19,5
40	880,2	872,4	876,7	870,8	904,3	916,4	871,6	900,8	886,7	885,0	19,0	-0,9	18,8
45	887,6	887,3	902,3	904,1	886,5	914,5	895,7	910,8	898,6	902,0	19,1	-0,8	18,5
50	902,6	905,4	921,4	922,9	901,4	929,4	914,2	928,2	915,7	918,0	19,1	-0,8	18,1
55	914,5	920,0	931,7	928,0	920,1	948,2	924,0	933,7	927,5	932,0	19,2	-0,7	17,6
60	928,6	933,3	943,4	940,0	934,6	961,1	936,7	947,6	940,7	945,0	19,2	-0,7	19,9
65	942,4	947,1	956,9	951,9	949,1	974,5	949,5	960,7	954,0	957,0	19,3	-0,7	17,5
70	954,8	961,2	971,7	965,7	961,2	985,6	963,5	970,8	966,8	968,0	19,3	-0,6	20,0
75	966,7	973,3	983,4	977,9	972,5	995,8	975,6	986,9	979,0	979,0	19,4	-0,6	17,2
80	978,1	984,7	993,9	987,8	984,5	1007,0	986,3	995,2	989,7	988,0	19,5	-0,5	18,3
85	984,4	990,6	996,5	991,4	992,1	1012,9	991,0	999,4	994,8	997,0	19,5	-0,5	17,1
90	993,5	999,3	1004,7	998,1	1000,9	1020,6	998,7	1005,9	1002,7	1006,0	19,6	-0,5	18,0
91	994,3	1000,3	1007,0	1000,3	1002,7	1022,5	1000,3	1006,0	1004,2	1008,0	19,6	-0,5	19,8
92	995,6	1000,3	1004,7	999,7	1003,5	1024,1	1000,0	1008,1	1004,5	1009,0	19,6	-0,5	18,8

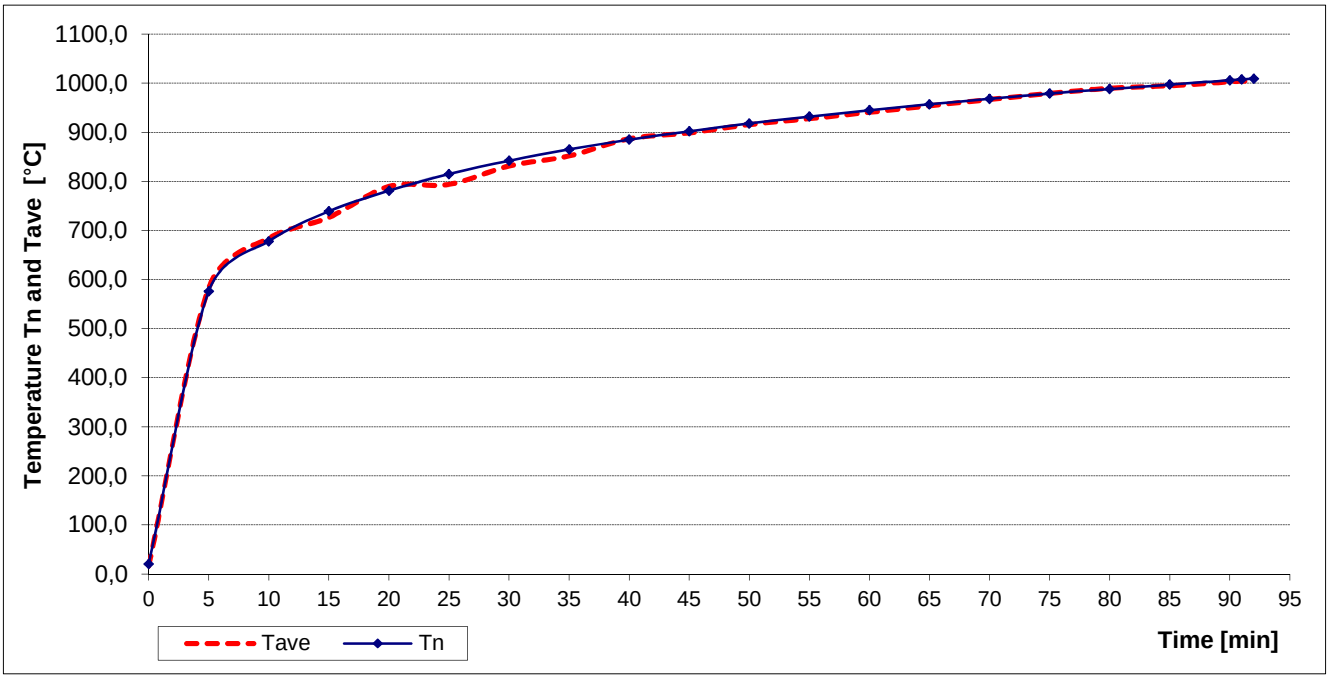
Tave Average temperature in the test furnace calculated from plate thermometers
Tn Standard temperature in the test furnace laid down to test guideline
To Ambient temperature
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline
p Pressure inside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

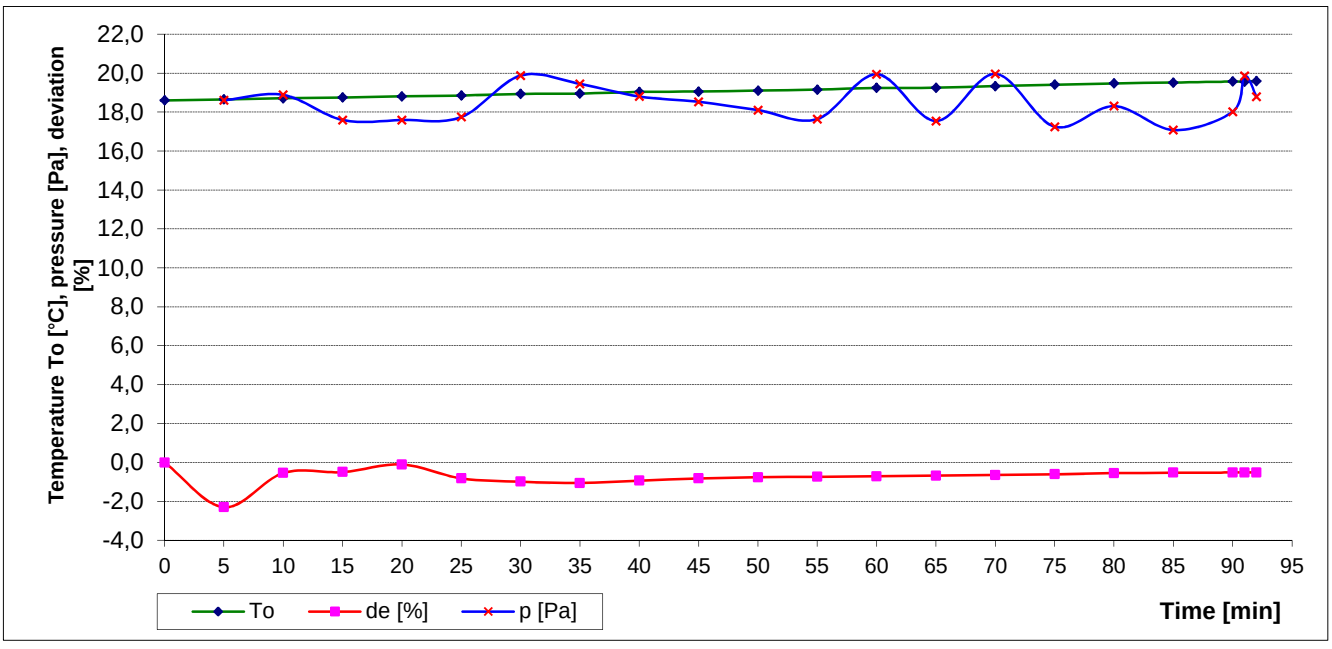
Layout of measuring points inside the test furnace:



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	57:44
	2-L2	x
	3-L3	x
	4-PEN	x
S2	5-L1	55:43
	6-L2	55:43
	7-L3	55:43
	8-PEN	x
S3	9-L1	51:16
	10-L2	51:16
	11-L3	x
	12-PEN	x
S4	13-L1	44:14
	14-L2	44:14
	15-L3	x
	16-PEN	x
S5	17-L1	62:13
	18-L2	62:13
	19-L3	62:13
	20-PEN	x
S6	21-L1	58:28
	22-L2	58:28
	23-L3	x
	24-PEN	x
S7	25-L1	x
	26-L2	89:29
	27-L3	x
	28-PEN	x
S8	29-L1	89:46
	30-L2	x
	31-L3	x
	32-PEN	x
S9	33-L1	86:10
	34-L2	86:10
	35-L3	86:10
	36-PEN	x
S10	37-L1	89:13
	38-L2	89:13
	39-L3	89:13
	40-PEN	x

Specimen No.	Cables
1	2 cables EUROSAFE FE180 UNSCREENED 4x2,5
2	2 cables EUROSAFE FE180 UNSCREENED 4x0,5
3	2 cables (N)HXH FE180/E30 4x25
4	2 cables (N)HXH FE180/E30 4x1,5
5	2 cables (N)HXH FE180/E30 4x25
6	2 cables (N)HXH FE180/E30 4x1,5
7	cable EUROSAFE FE180 UNSCREENED 4x2,5
8	cable EUROSAFE FE180 UNSCREENED 4x2,5
9	cable EUROSAFE FE180 UNSCREENED 4x0,5
10	cable EUROSAFE FE180 UNSCREENED 4x0,5

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

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

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S11	41-L1	no failure / interruption
	42-L2	no failure / interruption
	43-L3	no failure / interruption
	44-PEN	no failure / interruption
S12	45-L1	x
	46-L2	59:38
	47-L3	59:38
	48-PEN	x
S13	49-L1	x
	50-L2	54:47
	51-L3	54:47
	52-PEN	x
S14	53-L1	52:28
	54-L2	52:28
	55-L3	x
	56-PEN	x
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	54:49
	74-L2	54:49
	75-L3	54:49
	76-PEN	x
S20	77-L1	54:49
	78-L2	54:49
	79-L3	54:49
	80-PEN	x

Specimen No.	Cables
11	cable (N)HXH FE180/E30 4x25
12	cable (N)HXH FE180/E30 4x25
13	cable (N)HXH FE180/E30 4x1,5
14	cable (N)HXH FE180/E30 4x1,5
15	cable EUROSAFE FE180 UNSCREENED 4x2,5
16	cable EUROSAFE FE180 UNSCREENED 4x2,5
17	cable EUROSAFE FE180 UNSCREENED 4x0,5
18	cable EUROSAFE FE180 UNSCREENED 4x0,5
19	cable EUROSAFE FE180 UNSCREENED 4x2,5
20	cable EUROSAFE FE180 UNSCREENED 4x2,5

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 S26 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S21	81-L1	81:53
	82-L2	81:53
	83-L3	x
	84-PEN	x
S22	85-L1	78:56
	86-L2	78:56
	87-L3	78:56
	88-PEN	x
S23	89-L1	x
	90-L2	x
	91-L3	58:06
	92-PEN	x
S24	93-L1	48:04
	94-L2	x
	95-L3	x
	96-PEN	x
S25	97-L1	43:06
	98-L2	x
	99-L3	x
	100-PEN	x
S26	101-L1	48:27
	102-L2	x
	103-L3	x
	104-PEN	x

Specimen No.	Cables
21	cable EUROSAFE FE180 UNSCREENED 4x0,5
22	cable EUROSAFE FE180 UNSCREENED 4x0,5
23	cable (N)HXH FE180/E30 4x25
24	cable (N)HXH FE180/E30 4x25
25	cable (N)HXH FE180/E30 4x1,5
26	cable (N)HXH FE180/E30 4x1,5

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

Measured time of tested specimen S52 to S59 - 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	81:09
	212-PEN	x
S53A	213-L	77:39
	214-PEN	x
S53B	215-L	71:44
	216-PEN	x
S54A	217-L	51:00
	218-PEN	x
S54B	219-L	52:18
	220-PEN	x
S55A	221-L	87:50
	222-PEN	x
S55B	223-L	59:25
	224-PEN	x
S56A	225-L	76:38
	226-PEN	x
S56B	227-L	75:50
	228-PEN	x
S57A	229-L	85:40
	230-PEN	x
S57B	231-L	86:54
	232-PEN	x
S58A	233-L	84:29
	234-PEN	x
S58B	235-L	no failure / interruption
	236-PEN	no failure / interruption
S59A	237-L	81:07
	238-PEN	x
S59B	239-L	75:51
	240-PEN	x

Specimen No.	Cables
52	2 cables EUROSAFE JE-H(St)H 1x2x0,9
53	2 cables EUROSAFE JE-H(St)H 1x2x0,8
54	2 cables EUROSAFE JE-H(St)H 1x2x0,8
55	2 cables EUROSAFE JE-H(St)H 1x2x0,9
56	2 cables EUROSAFE JE-H(St)H 1x2x0,8
57	2 cables EUROSAFE JE-H(St)H 1x2x0,9
58	2 cables EUROSAFE JE-H(St)H 1x2x0,9
59	2 cables EUROSAFE JE-H(St)H 1x2x0,8

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.

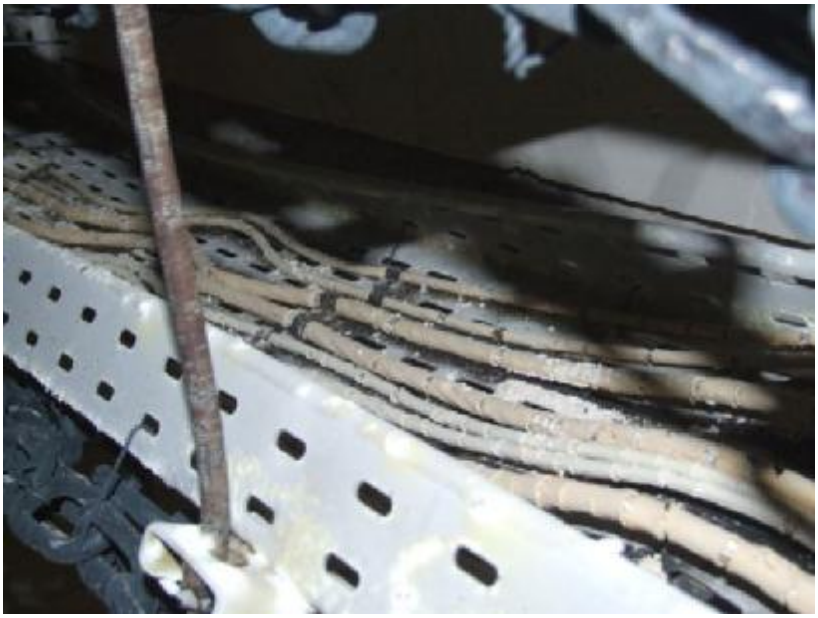
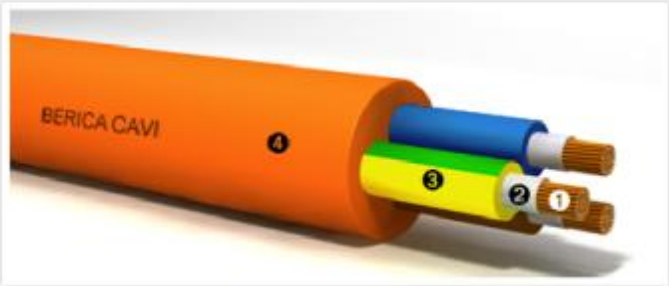


Photo taken after the test.

BERICA CAVI

(N)HXH 0,6/1 kV FE180/E30

Power, control and signaling cables, fire retardant, halogen free and fire resistant



1. Conductor
2. Flame protection
3. Insualtion
4. Sheath

APPLICATION: Suitable for the transport of energy and the transmission of signals and controls for electrical equipment when you need maximum security against fire, such as emergency lighting and alarm systems, automatic fire detection, fire extinguishing equipment, automatic opening doors, ventilation systems and conditioning, emergency telephone systems.

INSTALLATION: For fixed indoor and outdoor installation in dry or wet environments. They can be installed on walls and metal structures, on platforms, pipes, conduits and similar systems. Cable for direct and indirect burial.

FEATURES	DESCRIPTION	STANDARDS
Conductors :	Annealed red copper	CEI EN 60228 (Tab. 9)
Flame protection :	Mica-glass tape, thickness >0,10 mm	
Insulation :	LSZH compound	CEI EN 50363
Cores colour :		CEI UNEL 00722 – HD 308
Sheath :	LSZH compound	CEI EN 50363
Sheath colour :	Orange Ral 2004	
Fire retardant :		CEI EN 60332-3-24
Flame retardant :		CEI EN 60332-1-2
Halogen free :	(<0,5 mg/g - 0,5%)	CEI EN 50267-2-1/2 - IEC 60754-1/2
Low toxic gases emission :	(indice di tossicità <2%)	CEI 20-37/4-0
Low smoke emission :	(trasmittanza >60%)	CEI EN 61034-2
Fire resistant :	Duration 90 min. at 830 °C. - 0 ÷ + 40 °C	CEI EN 50200 per Ø < 20 mm
Fire resistant :	Duration 120 min. at 830 °C. - 0 ÷ + 40 °C	CEI EN 50362 per Ø > 20 mm
Fire resistant :	Duration 180 min. at 750 °C (FE 180)	IEC 60331-21 – VDE 472-814
Fire resistant :	(E30)	DIN VDE 4102-12
DC resistance :	According to	CEI EN 60228 (Tab. 9)
Current capacity :		CEI UNEL 35024/1 - CEI UNEL 35026
Rated voltage Uo/U:	0,6/1 kV	
Max voltage :	1,2 kV	
Testing voltage :	4 kV	

CABLES

BERICA CAVI

Max working temperature :	90 °C
Short-circuit temperature :	250 °C
Min. installation temperature :	0 °C
Bending radius :	Ø x 14
Printing :	BERICA CAVI S.P.A. ITALY (N)HXH FE180 / E30 IEC 60331-21 DIN VDE 4102-12 CE Year/Lot - N° cores x/G Sect Metric marking

TYPE (N°. cores x sect.) N° x mm^2	MEDIUM Ø OUTER mm	MEDIUM WEIGHT kg/km	PRODUCT CODE
1x1,5	7,0	68,0	
2x1,5	12,2	191,0	
3G1,5	12,8	217,0	
4G1,5	13,9	243,0	
5G1,5	15,1	298,0	
1x2,5	7,5	78,0	
2x2,5	13,0	224,0	
3G2,5	13,9	264,0	
4G2,5	14,9	310,0	
5G2,5	16,3	370,0	
1x4	8,0	96,0	
2x4	14,0	274,0	
3G4	15,0	327,0	
4G4	16,1	380,0	
5G4	17,6	477,0	
1x6	8,6	121,0	
2x6	15,2	342,0	
3G6	16,1	412,0	
4G6	17,6	489,0	
5G6	19,3	612,0	
1x10	9,9	182,0	
2x10	17,8	496,0	
3G10	18,9	614,0	
4G10	20,7	756,0	
5G10	22,8	935,0	
1x16	11,0	246,0	
2x16	20,0	673,0	
3G16	21,2	819,0	
4G16	23,4	1021,0	
5G16	25,7	1267,0	
1x25	12,8	353,0	
2x25	23,6	900,0	
3G25	25,1	1206,0	
4G25	27,7	1481,0	

CABLES

BERICA CAVI

5G25	31,0	1868,0
1x35	13,5	457,0
1x50	15,5	650,0
1x70	17,5	806,0
1x95	20,1	1062,0
1x120	22,6	1342,0
1x150	24,9	1690,0
1x185	27,7	1930,0
1x240	29,1	2500,0
7G1,5	14,2	315,0
10G1,5	17,9	420,0
12G1,5	18,9	492,0
16G1,5	21,1	596,0
19G1,5	22,3	693,0
24G1,5	25,6	880,0
36G1,5	30,5	1230,0
48G1,5	35,1	1620,0
7G2,5	15,8	412,0
10G2,5	19,9	560,0
12G2,5	21,1	650,0
16G2,5	23,6	820,0
19G2,5	25,0	930,0
24G2,5	28,8	1180,0
36G2,5	34,2	1810,0
48G2,5	39,5	2450,0

BERICA CAVI

EUROSAFE FE 180 UNSCREENED 300/500 V

Power, control and signaling cables, fire retardant, halogen free and fire resistant

1. Conductor
2. Insulation
3. Sheath

APPLICATION: Suitable for the transport of energy and the transmission of signals and controls for electrical equipment when you need maximum security against fire, such as emergency lighting and alarm systems, automatic fire detection, fire extinguishing equipment, automatic opening doors, ventilation systems and conditioning, emergency telephone systems.

INSTALLATION: For fixed indoor installation in dry or wet environments and temporarily outdoor. They can be installed on platforms, pipes, conduits and similar systems.

FEATURES	DESCRIPTION	STANDARDS
Conductors :	Annealed red copper cl.1	CEI EN 60228 (Tab. 9)
Insulation :	Ceramifiable silicone rubber	
Cores colour :		CEI UNEL 00722 – HD 308
Sheath :	LSZH compound, M1 quality	CEI EN 50363
Sheath colour :	Red RAL 3000	
Fire retardant :		CEI EN 60332-3-24
Flame retardant :		CEI EN 60332-1-2
Halogen free :	(<0,5 mg/g - 0,5%)	CEI EN 50267-2-1/2 - IEC 60754-1/2
Low smoke emission :	(Trasmittance >60%)	CEI EN 61034-2
Fire resistant :	Duration 120 min. at 830 °C. -0 ÷ +40 °C (PH 120)	CEI EN 50200
Fire resistant :	Cat. C (3h at 950°C)	BS 6387 cat. CWZ
Fire resistant :	Duration 180 min. at 750 °C (FE180)	IEC 60331-21–VDE472-814
DC resistance :	According to	CEI EN 60228 (Tab. 9)
Rated voltage Uo/U:	300/500 V	
Max voltage :	550 V	
Testing voltage :	2 kV	
Max working temperature :	90 °C	
Max conductor temperature :	180 °C	
Short-circuit temperature :	350 °C	

CABLES

BERICA CAVI

Min. installation temperature :	0 °C
Bending radius :	Ø x 8
Printing :	EUROSAFE UNSCREENED 300/500 V FE 180 BS 6387 CWZ CEI EN 50200 PH(120) IEC 60332-3-24 CE N° cores x Sect. mm2 Year/Lot

TYPE (N°. cores x Ø) N° x mm^2	MEDIUM Ø OUTER mm	MEDIUM WEIGHT kg/km	PRODUCT CODE
2x0,50	5,5	32	B7302080U
2X0,75	6,0	44	B7302075U
3x0,75	6,6	60	B7303075U
4x0,75	7,1	74	B7304075U
2x1	6,6	54	B7302100U
3x1	7,0	70	B7303100U
4x1	7,6	87	B7304100U
2x1,5	8,0	78	B7302150U
3x1,5	8,5	102	B7303150U
4x1,5	9,3	128	B7304150U
5x1,5	10,1	154	B7305150U
2x2,5	8,8	102	B7302250U
3x2,5	9,4	138	B7303250U
4x2,5	10,2	174	B7304250U
5x2,5	11,2	212	B7305250U

BERICA CAVI

EUROSAFE JE-H(St)H 300/500 V

Control and signaling cable, Al/PET tape screen, fire retardant, halogen free and fire resistant

1. Conductor
2. Insulation
3. Flame protection
4. Drain wire
5. Screen
6. Sheath

APPLICATION: Suitable for the transmission of signals and controls for electrical equipment when you need maximum security against fire, such as emergency lighting and alarm systems, automatic fire detection, fire extinguishing equipment, automatic opening doors, ventilation systems and conditioning, emergency telephone systems.

INSTALLATION: For fixed indoor installation in dry or wet environments and temporarily outdoor. They can be installed on platforms, pipes, conduits and similar systems.

FEATURES	DESCRIPTION	STANDARDS
Conductors :	Annealed red copper cl. 1	CEI EN 60228 (Tab. 9)
Insulation :	Ceramifiable silicone rubber	
Cores colour :	(blue-red)-(yellow-grey)-(green-brown)-(white-black)	DIN VDE 815
Flame protection :	Glass-fibre tape thickness 0,12 mm	
Drain wire :	Annealed tinned copper	
Screen :	Al/Pet tape thickness 9/23 µm covering > 110%	
Sheath :	LSZH compound, M1 quality	CEI EN 50363
Sheath colour :	Red RAL3000	
Fire reatardant :		CEI EN 60332-3-24
Flame retardant :		CEI EN 60332-1-2
Halogen free :	(< 0,5 mg/g - 0,5%)	CEI EN 50267-2-1/2 - IEC 60754-1/2
Low smoke emission :	(Trasmittance >60%)	CEI EN 61034-2
Fire resistant :	Duration 120 min. at 830 °C. - 0 + + 40 °C (PH 120)	CEI EN 50200
Fire resistant :	(E30/E60)	DIN VDE 4102-12
Fire resistant :	Duration 180 min. at 750 °C (FE180)	IEC 60331-21 - VDE 472-814
DC resistance :	According to	CEI EN 60228 (Tab. 9)
Rated voltage Uo/U :	300/500 V	
Max voltage :	550 V	
Testing voltage :	2 kV	
Max working temperature :	90 °C	

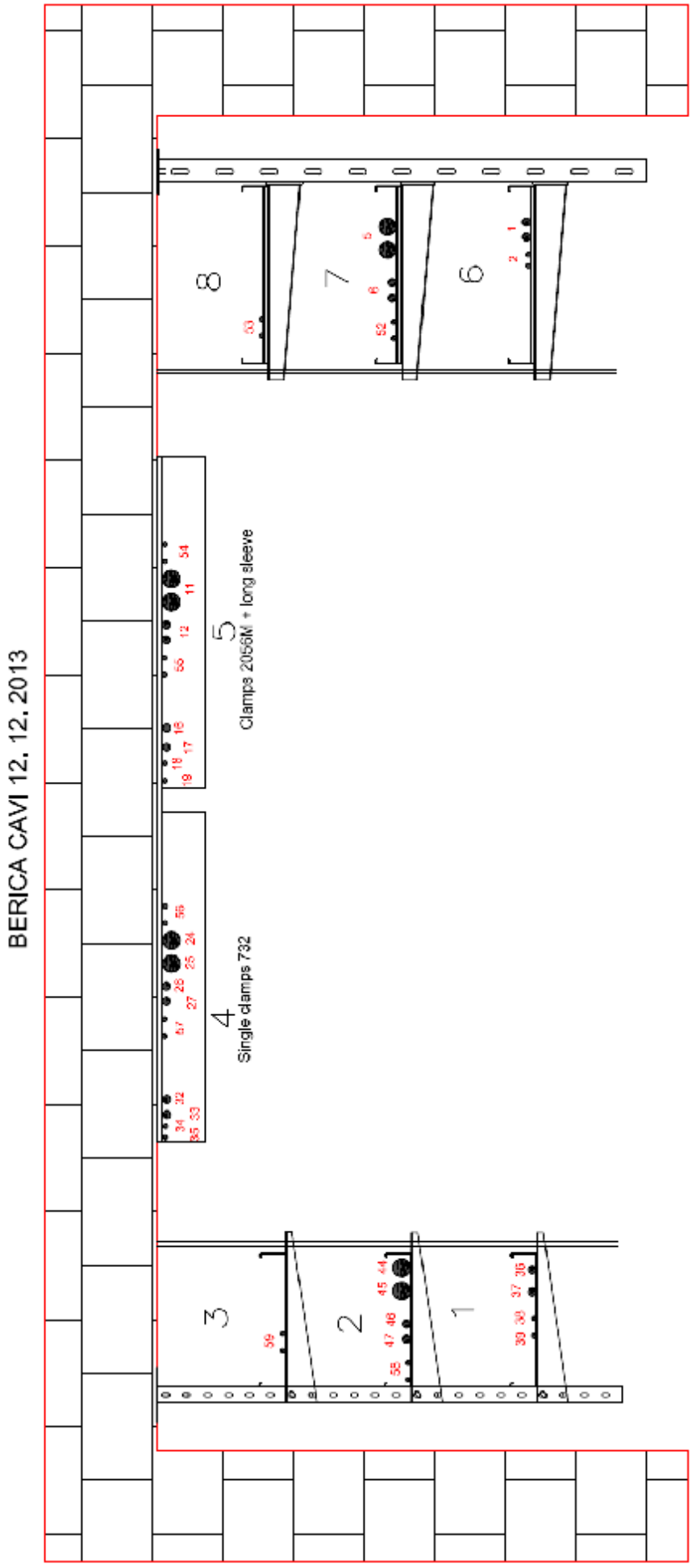
CABLES

BERICA CAVI

Max conductor temperature :	180 °C
Short-circuit temperature :	350 °C
Min. installation temperature :	0 °C
Bending radius :	Ø x 10
Printing :	EUROSAFE JE-H(St)H E30/E60 DIN 4102-12 CEI EN 50200 PH(120) CE N° pairs x 2 x Ø cond. mm Year/Lot

TYPE (N°. cores x Ø) N° x mm	MEDIUM Ø OUTER mm	MEDIUM WEIGHT kg/km	PRODUCT CODE
1x2x0,80	5,6	40	B7301C080FR
2x2x0,80	8,6	77	B7302C080FR
3x2x0,80	9,4	97	B7303C080FR
4x2x0,80	10,6	126	B7304C080FR
5x2x0,80	11,6	147	B7305C080FR
7x2x0,80	12,7	187	B7307C080FR
8x2x0,80	13,4	214	B7308C080FR
10x2x0,80	14,8	256	B7310C080FR
12x2x0,80	16,2	299	B7312C080FR
1x2x0,90	6,0	45	B7301C090FR
2x2x0,90	8,8	84	B7302C090FR
6x2x0,90	12,7	190	B7306C090FR
12x2x0,90	16,9	344	B7312C090FR

DRAWINGS


BERICA CAVI 12. 12. 2013
8
7
6
5
Clamps 2056M + long sleeve
4
Single clamps 732
3
2
1

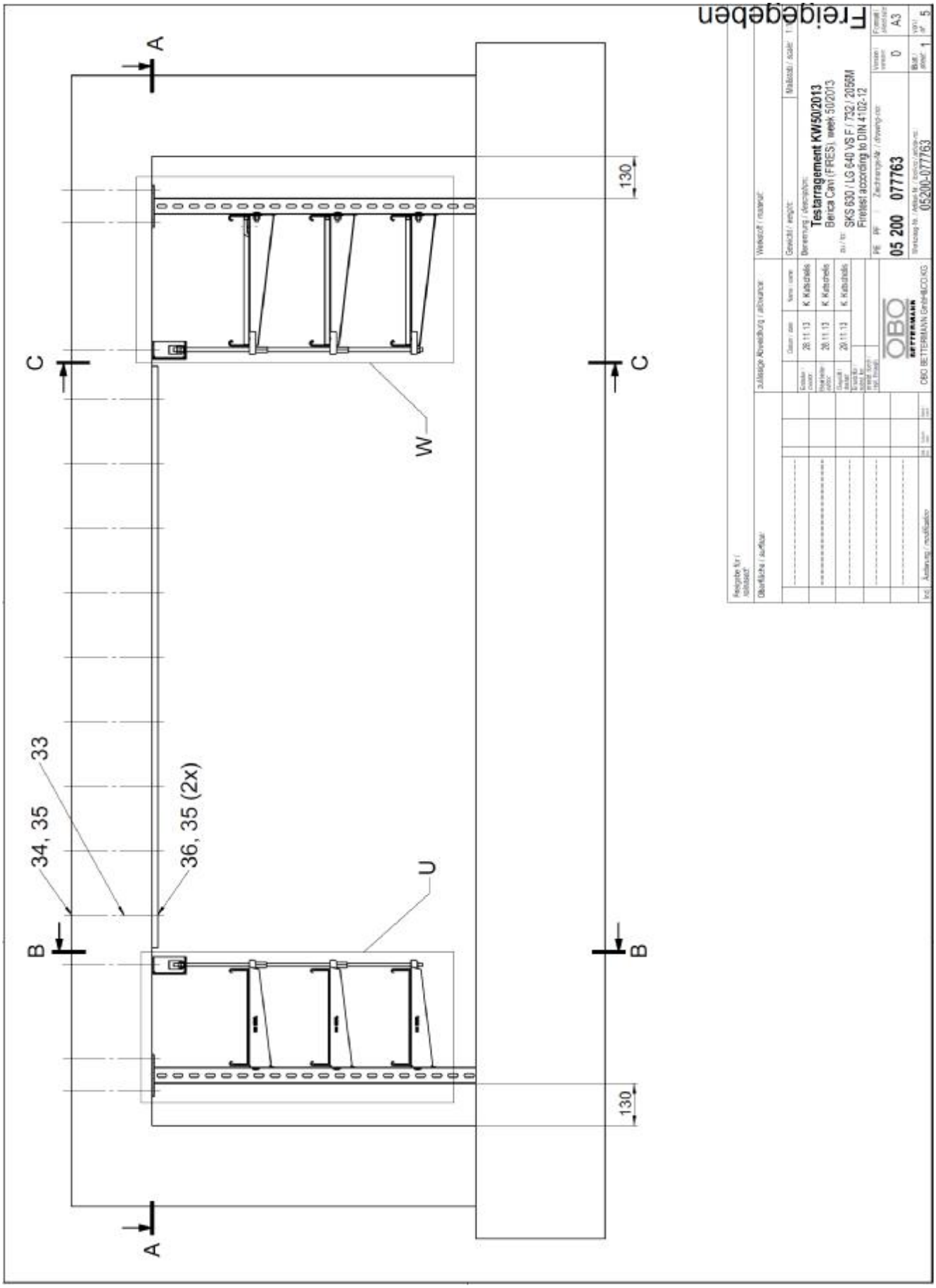
DRAWINGS

Specimen No.	Cables	Track No.	Construction
19	cable EUROSAFE FE180 UNSCREENED 4x2,5	1	Cable trays SKS630, consoles US3K/100, brackets MWA12/31, holders ABL, threaded rods M10, ceiling clamps BSB Consoles in spacing of 1200 mm, loading 10kg.m^{-1}
20	cable EUROSAFE FE180 UNSCREENED 4x2,5		
21	cable EUROSAFE FE180 UNSCREENED 4x0,5		
22	cable EUROSAFE FE180 UNSCREENED 4x0,5		
23	cable (N)HXH FE180/E30 4x25	2	
24	cable (N)HXH FE180/E30 4x25		
25	cable (N)HXH FE180/E30 4x1,5		
26	cable (N)HXH FE180/E30 4x1,5		
58	2 cables EUROSAFE JE-H(St)H 1x2x0,9		
59	2 cables EUROSAFE JE-H(St)H 1x2x0,8	3	
11	cable (N)HXH FE180/E30 4x25	4	Ceiling profiles 1268L, single cable clips type 732 in spacing of 300 mm, threaded rods M6
12	cable (N)HXH FE180/E30 4x25		
13	cable (N)HXH FE180/E30 4x1,5		
14	cable (N)HXH FE180/E30 4x1,5		
15	cable EUROSAFE FE180 UNSCREENED 4x2,5		
16	cable EUROSAFE FE180 UNSCREENED 4x2,5		
17	cable EUROSAFE FE180 UNSCREENED 4x0,5		
18	cable EUROSAFE FE180 UNSCREENED 4x0,5		
56	2 cables EUROSAFE JE-H(St)H 1x2x0,8		
57	2 cables EUROSAFE JE-H(St)H 1x2x0,9		
5	2 cables (N)HXH FE180/E30 4x25	5	Ceiling profiles 1268L, single cable clips type 2056M + long sleeve in spacing of 600 mm, threaded rods M6
6	2 cables (N)HXH FE180/E30 4x1,5		
7	cable EUROSAFE FE180 UNSCREENED 4x2,5		
8	cable EUROSAFE FE180 UNSCREENED 4x2,5		
9	cable EUROSAFE FE180 UNSCREENED 4x0,5		
10	cable EUROSAFE FE180 UNSCREENED 4x0,5		
54	2 cables EUROSAFE JE-H(St)H 1x2x0,8		
55	2 cables EUROSAFE JE-H(St)H 1x2x0,9		
1	2 cables EUROSAFE FE180 UNSCREENED 4x2,5	6	Cable ladders LG640VSF, consoles US3K/100, brackets MWA12/41, holders ABR, threaded rods M12, ceiling clamps BSB Consoles in spacing of 1200 mm, loading 20kg.m^{-1}
2	2 cables EUROSAFE FE180 UNSCREENED 4x0,5		
3	2 cables (N)HXH FE180/E30 4x25	7	
4	2 cables (N)HXH FE180/E30 4x1,5		
52	2 cables EUROSAFE JE-H(St)H 1x2x0,9		
53	2 cables EUROSAFE JE-H(St)H 1x2x0,8	8	

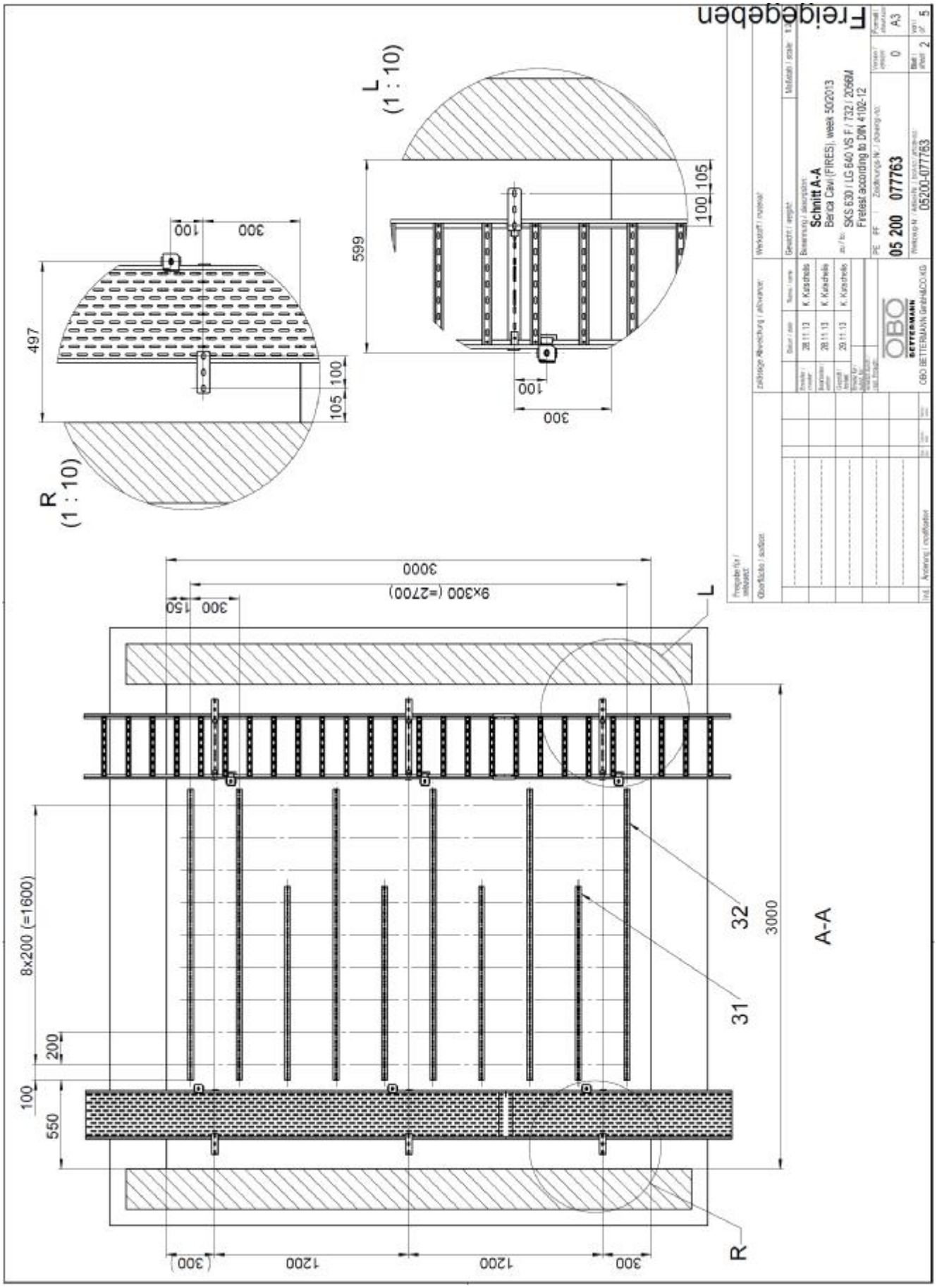
Proposal of the cable arrangement for fire test according DIN 4102 Teil 12
Berica Cavi (FIRES)

Test cables			Verlegeart					
Type	Dimension	Test voltage	Cable tray SKS630 B=300mm, 10 kg/m 1,2m		Cable ladder LG640VSF B=400mm, 20kg/m, 1,2m		Single clamp 732 0,3m	Clamp 2056M + long sleeve 0,6m
			position	quantity	position	quantity	quantitiy	quantity
(N)HXH FE180/E90	4x1,5	400V	R 1	2	L 1	2	2	2
	4x25	400V	R 1	2	L 1	2	2	2
(N)HXH FE180/E30	4x1,5	400V	R 2	2	L 2	2	2	2
	4x25	400V	R 2	2	L 2	2	2	2
EUROSAFE JE-H(St)H	1x2x0,8	110V	R 1	2	L 1	2	2	2
	1x2x0,9	110V	R 2	2	L 2	2	2	2
EUROSAFE FE180 UNSCREENED	4x0,5	400V	R 3	2	L 3	2	2	2
	4x2,5	400V	R 3	2	L 3	2	2	2
EUROSAFE FE180 SCREENED	4x0,5	400V	R 3	2	L 3	2	2	2
	4x2,5	400V	R 3	2	L 3	2	2	2

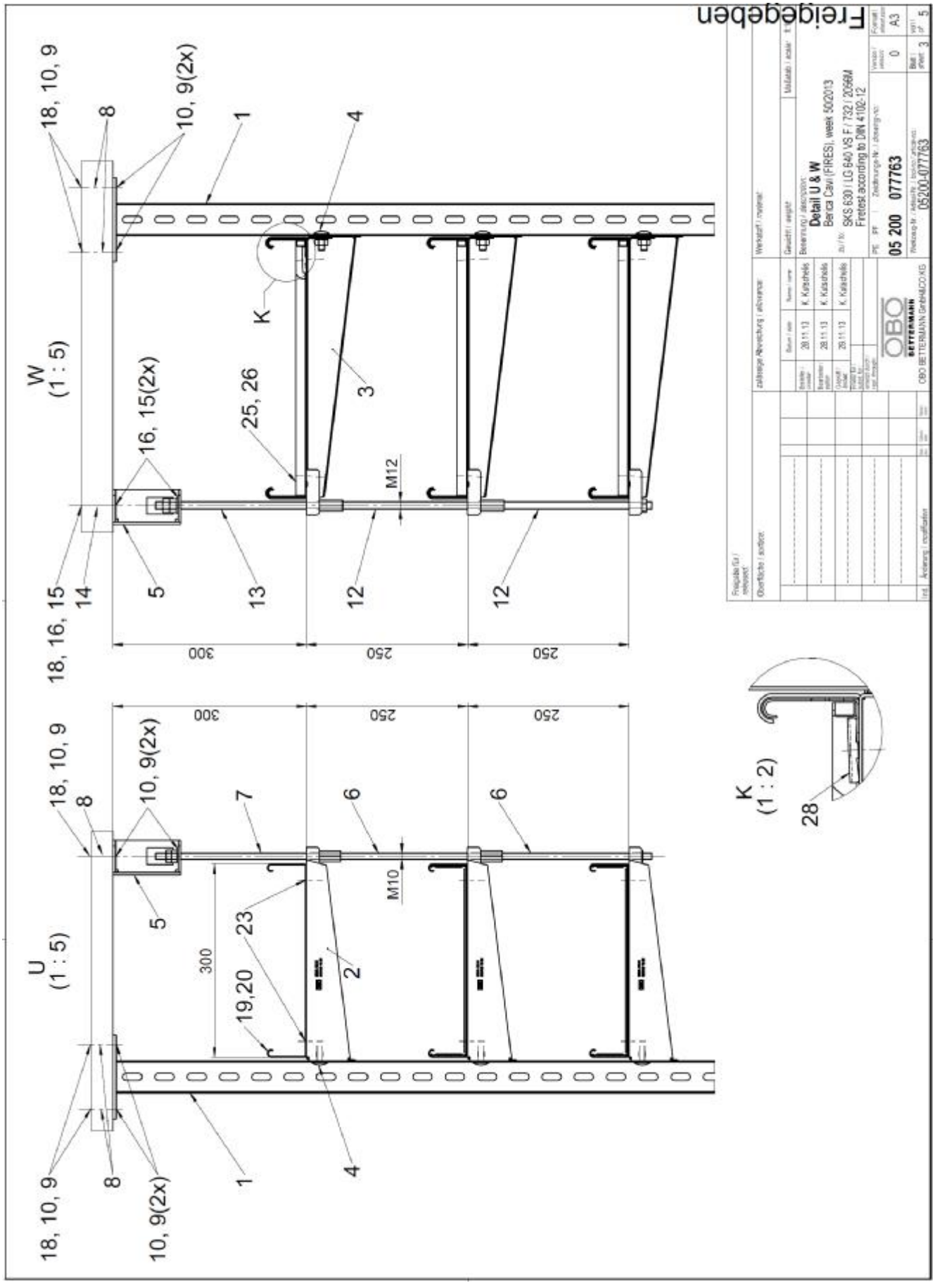
DRAWINGS


A
C
B
130
W
U
33
34, 35
36, 35 (2x)
Freigegeben
Testarragement KW50/2013
Berica Cavi (FIRES) week 50/2013
SKS 630 / LG 640 VS F / 732 / 2056M
Firetest according to DIN 4102-12
05 200 077763
05200-077763
OBO BETTERMANN GmbH&CO KG

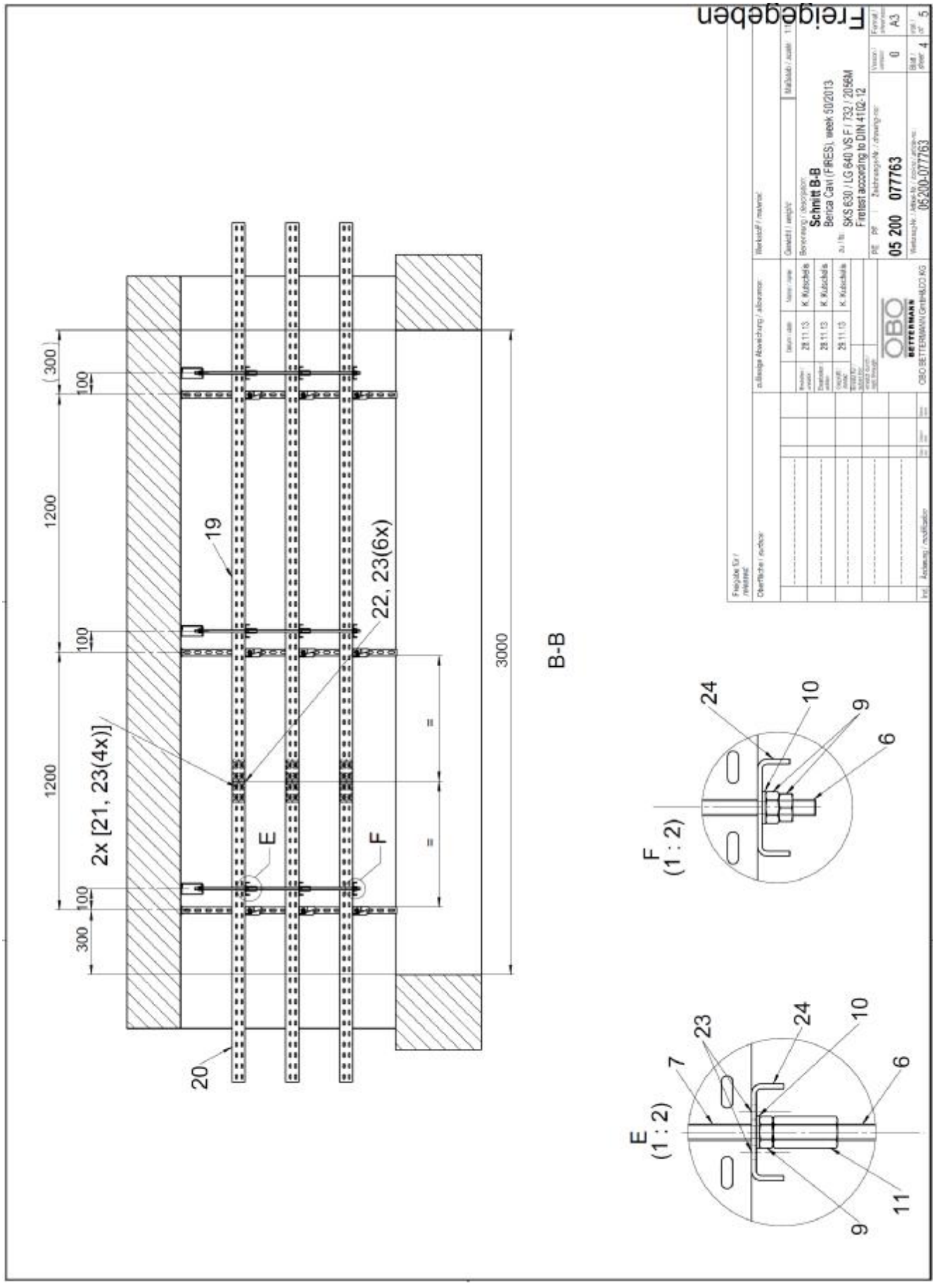
DRAWINGS


Freigegeben
L
(1 : 10)
599
100
105
300
R
(1 : 10)
497
105
100
3000
9x300 (=2700)
8x200 (=1600)
200
100
550
32
31
3000
A-A
1200
1200
OBO BETTERMANN GmbH&CO. KG
05200-077763
05 200 077763
Schnitt A-A
Barca Cavi (FIRES), week 50/2013
SKS 630 / LG 640 VS F / 732 / 2056M
Firetest according to DIN 4102-12

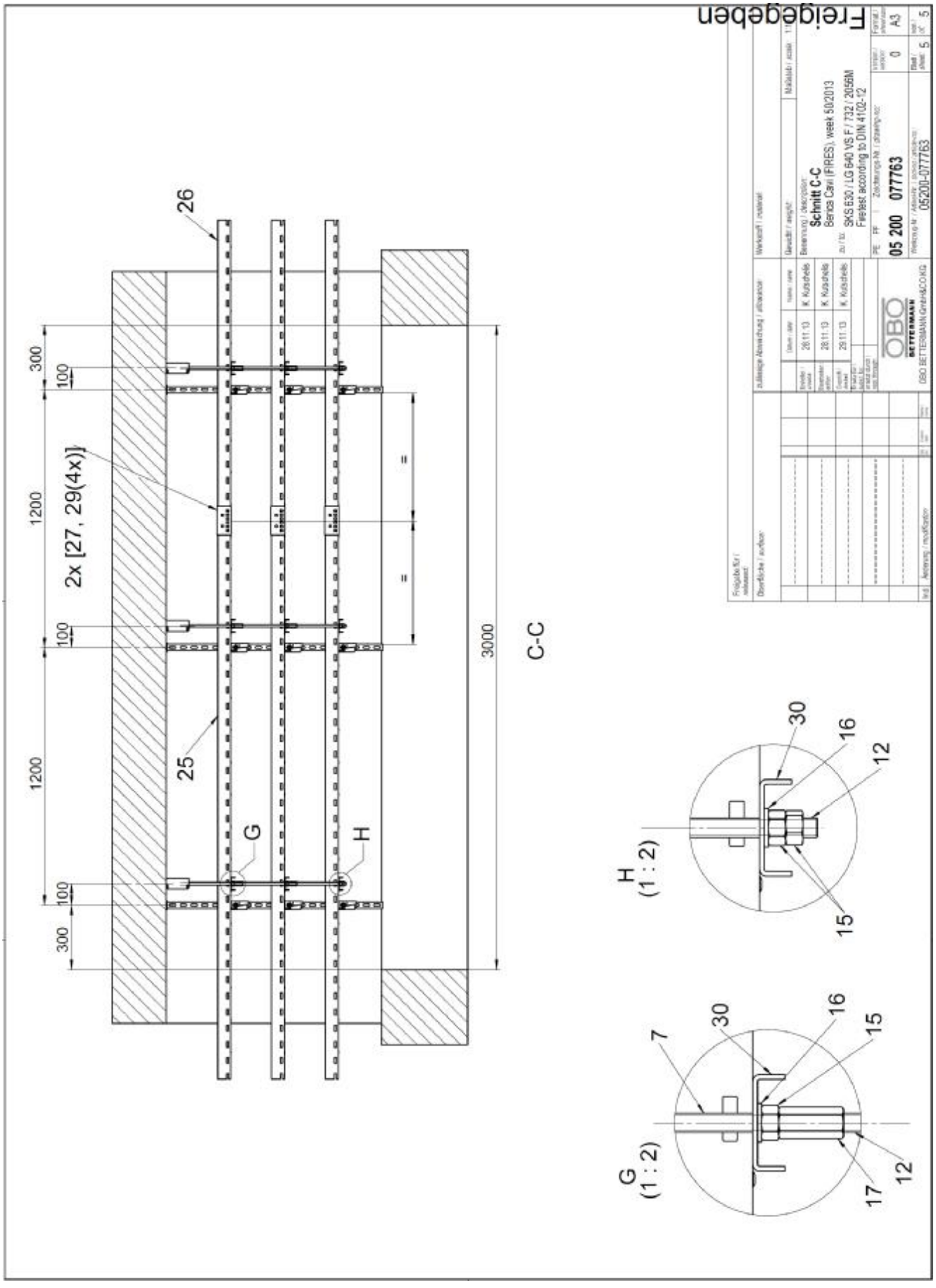
DRAWINGS


Freigegeben
W
(1 : 5)
U
(1 : 5)
K
(1 : 2)
18, 10, 9
8
10, 9(2x)
1
4
K
16, 15(2x)
25, 26
3
M12
18, 16, 15
14
5
13
12
12
300
250
250
7
6
6
M10
23
2
19,20
300
28
05 200 077763
Detail U & W
Berica Cavi (FIRES), week 50/2013
SKS 630 / LG 640 XS F / 732 / 2066M
Fretest according to DIN 4102-12
05200-077763
OBO BETTERMANN GmbH&CO KG

DRAWINGS


Freigegeben
B-B
3000
1200
1200
300
100
100
100
300
2x [21, 23(4x)]
19
22, 23(6x)
20
E
F
E (1 : 2)
F (1 : 2)
24
10
9
6
23
7
11
Schnitt B-B
Benica Cavi (FIRES\) week 50/2013
SKS 630 / LG 640 VS F / 732 / 2056M
Firetest according to DIN 4102-12
05 200 077763
05200-077763
OBO BETTERMANN GmbH&CO KG

DRAWINGS

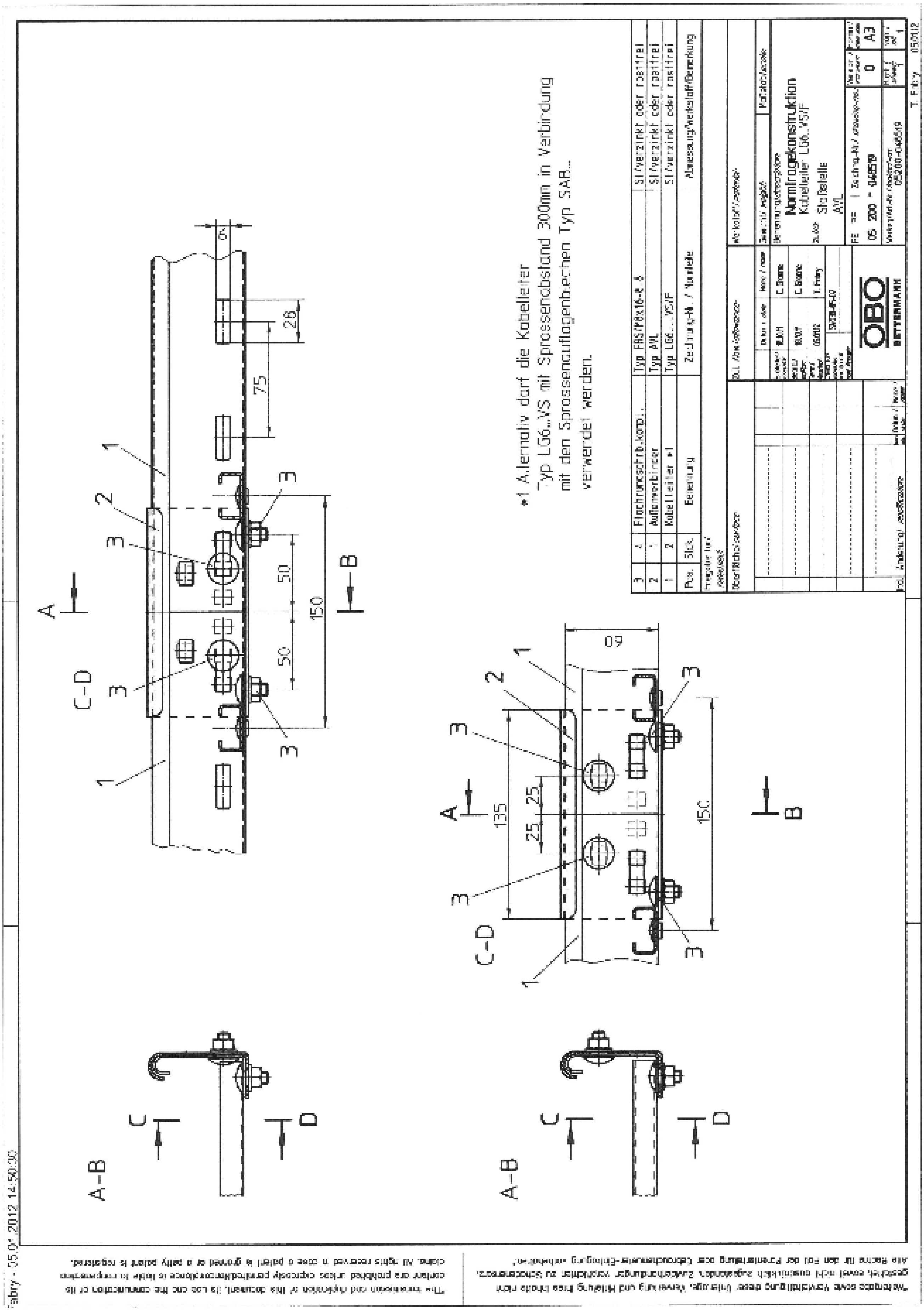

Freigegeben
26
25
2x [27, 29(4x)]
300
100
1200
100
1200
100
300
3000
C-C
G
H
(1 : 2)
30
16
12
15
7
17
Schnitt C-C
Benos Cavi (FIRES), week 50/2013
SKS 630 / LG 640 VS-F / 732 / 2056M
Fieldtest according to DIN 4102-12
05 200 077763
05200-077763
OBO BETTERMANN GmbH&CO KG

DRAWINGS

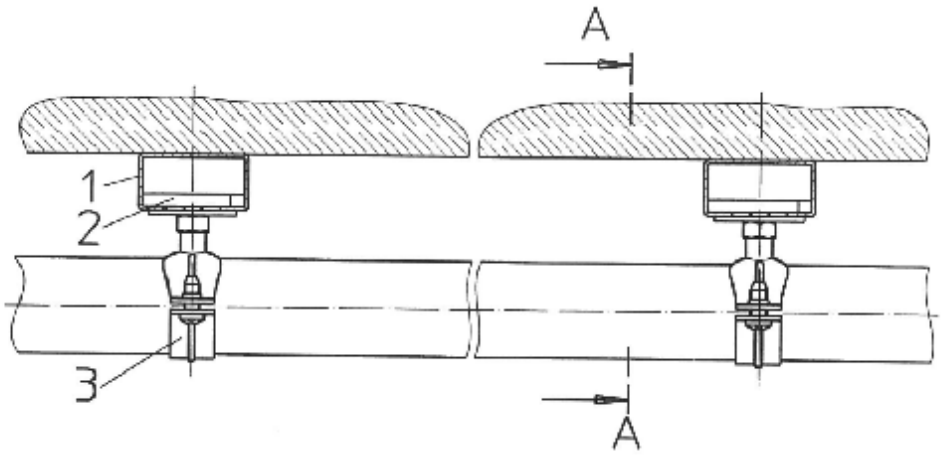
Parts list for fire test according DIN 4102 Teil 12
Berica Cavi, week 50/2013 (FIRES)

pos.	quantity	name	type	remark
1	6	U-suspended support	US3K/100	length L=1000
2	9	bracket	MWA12/31	length L=310
3	9	bracket	MWA12/41	length L=410
4	18	truss-head bolt (compl.)	FRS10/25	M10x25
5	6	fire protection clamp	BSB	
6	6	threaded rod	2078/M10	M10x250
7	3	threaded rod	2078/M10	M10x270
8	15	threaded rod	2078/M10	M10x300
9	63	hexagonal nut	934; DIN EN 24032	M10
10	42	washer	966/10; DIN 125	for M10
11	6	connection sleeve	12005	M10x40
12	6	threaded rod	2078/M12	M12x250
13	3	threaded rod	2078/M12	M12x270
14	3	threaded rod	2078/M12	M12x300
15	27	hexagonal nut	934; DIN EN 24032	M12
16	18	washer	966/12; DIN 125	for M12
17	6	connection sleeve	12005	M12x40
18	18	counter plate	K 60	50x60
19	3	cable tray	SKS 630	width B=300, length L=2600
20	3	cable tray	SKS 630	width B=300, length L=1400
21	6	angle connctor	RWVL60	
22	3	joint plate	SSLB300	width B=300
23	78	truss-head bolt (compl.)	FRSB6x15	M6x15
24	9	connection component	ABR	
25	3	cable ladder	LG640VS/F	width B=400, length L=2600
26	3	cable ladder	LG640VS/F	width B=400, length L=1400
27	6	external connector	AVL60	
28	18	clamping piece	LKS40	
29	24	truss-head bolt (compl.)	FRS8x16	M8x16
30	9	connection component	ABL	
31	4	profile rail	1268L	length L=1100
32	6	profile rail	1268L	length L=1800
33	78	threaded rod	2078/M6	M6x250
34	78	washer	967/6	for M6; D=28
35	234	hexagonal nut	934; DIN EN 24032	M6
36	78	washer	966/6; DIN 125	for M6

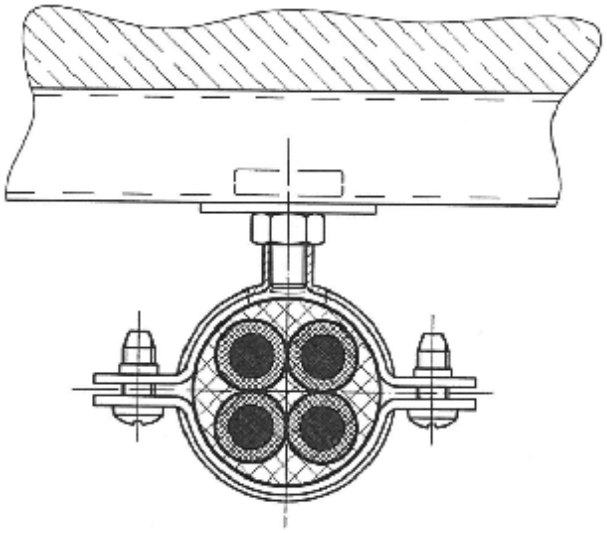
DRAWINGS


*1 Alternativ darf die Kabelleiter Typ LG6...VS mit Sprossenabstand 300mm in Verbindung mit den Sprossenauflagenblechen Typ SAR... verwendet werden.
A-B
C-D
Flachrundschraub.komb.
Außenverbinder
Kabelleiter *1
Benennung
Typ FRS FRS/M8x16-A...
Typ AVL
Typ LG6...VS/F
Zeichnungs-Nr. / Normteile
St/verzinkt oder rostfrei
Abmessung/Werkstoff/Bemerkung
Normtragekonstruktion
Kabelleiter LG6..VS/F
Stoßstelle
AVL
05 200 * 048519
A3
OBO
BETTERMANN

DRAWINGS



A – A 1:2



Kabelbelegung:
1 Kabel pro Schelle

Pos.	Stck.	Benennung	Zeichnung-Nr. / Normteile	Abmessung/Werkstoff/Bemerkung
3	1	Schraubrohrschelle	Typ 732	St/verzinkt
2	1	Hammerkopf.-Befestigungss.	Typ 5026, M6x16	St/verzinkt
1	1	Profilschiene	Typ 1268/SL	St/verzinkt

Oberfläche:

Zul. Abw.:

Maßstab: 1:1 (1:2)

Gewicht:

Werkstoff:

Ind.	Änderung	Datum	Name

	Datum	Name
Bearb.	06.03.2001	Beckmann
Gepr.		
Plot		

Ersatz für:

ers. durch:

Benennung: Funktionserhalt nach DIN 4102 Teil 12

Verlegung mit Schraubrohrschelle Typ 732

Prüfaufbau

Zeichng.-Nr. SV023-04-01

Version:

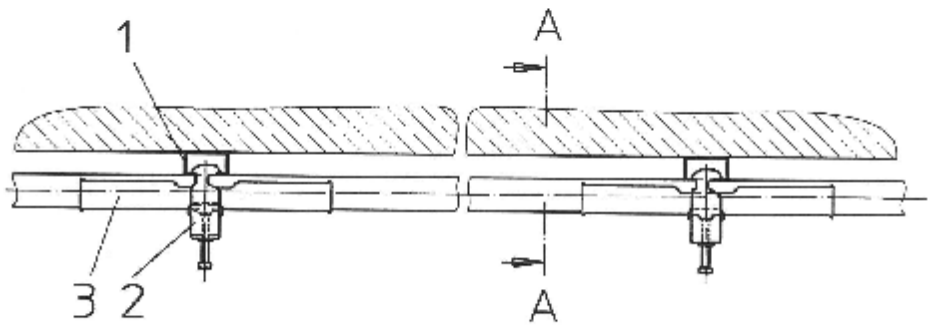
Werkzeugnr.:

Blatt:

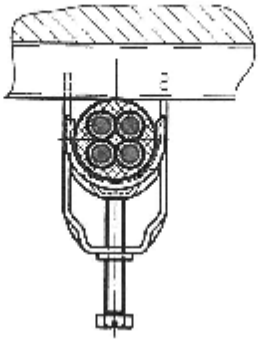
von

OBO BETTERMANN

DRAWINGS



A–A 1:2



Pos.	Stck.	Benennung	Zeichnung Nr. / Normteile	Abmessung/Werkstoff/Bemerkung
3	1	Langwanne	Typ 2058/LW	St/verzinkt
2	1	Bügelschelle	Typ 2056/M	St/verzinkt
1	1	Profilschiene	Typ 1268/SL	St/verzinkt

Oberfläche:

Zul. Abw.:

Maßstab: 1:5(1:2)

Gewicht:

Werkstoff:

Ind.	Änderung	Datum	Name

	Datum	Name
Bearb.	06.03.2001	Beckmann
Gepr.		
Ptol		

Ersatz für:

ers. durch:

Benennung: Funktionserhalt nach DIN 4102 Teil 12
Verlegung mit
Bügelschelle Typ 2056/M u.
Langwanne Typ 2058/LW
Prüfaufbau

OBO BETTERMANN

Zeichng.-Nr.: SV023-03-01

Version:

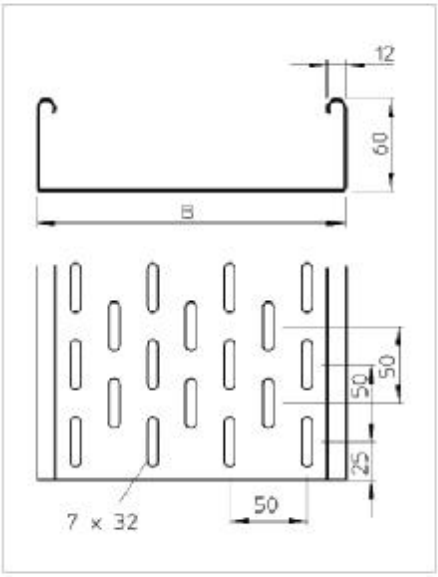
Werkzeugnr.:

Blatt-

von:

DRAWINGS

Technical data sheet
Cable tray SKS



SKS 60 = heavy-duty cable tray system with 60 mm side height. FS version includes RV 60 straight connector set.

The cable tray, type SKS, should also be used for function maintenance. For additional data, please refer to BSS fire protection systems.

Type	Length mm	Width mm	Plate thickness mm	Weight kg/100 m	Art-No.
SKS 620 FS	3000	200	1.5	346.670	6056202
SKS 630 FS	3000	300	1.5	455.300	6056296
SKS 640 FS	3000	400	1.5	522.000	6056407
SKS 650 FS	3000	500	1.5	650.300	6056504
SKS 660 FS	3000	600	1.5	749.300	6056601
SKS 610 FS	3000	100	1.5	239.400	6056105

St Steel FS Strip-galvanised /m

DRAWINGS

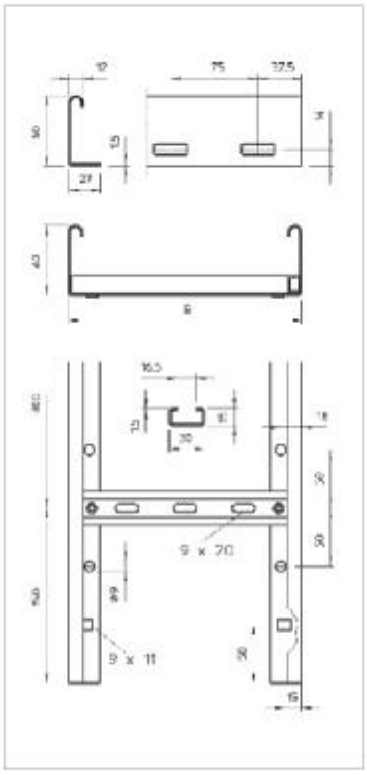
Technical data sheet
Cable ladder LG 60

Cable ladder with perforated side rail of side height 60 mm with riveted C profile rungs, open in an upwards direction (VS version).

The cable ladder is shipped folded up.

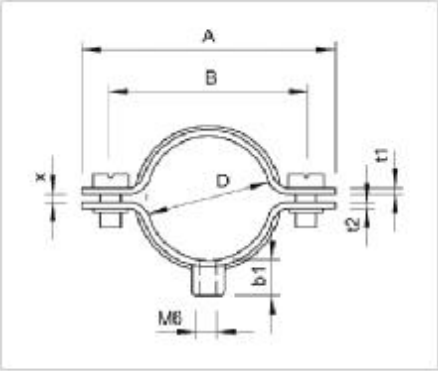
Type	Width mm	Rail thickness mm	Length mm	Usable cross-section cm²	Weight kg/100 m	Art.-No.
LG 620 VS VA4571	200	1.5	6000		273.800	6101200
LG 630 VS VA4571	300	1.5	6000		298.000	6101208
LG 640 VS VA4571	400	1.5	6000		322.200	6101216
LG 650 VS VA4571	500	1.5	6000		346.300	6101223
LG 660 VS VA4571	600	1.5	6000		378.300	6101232

VA Stainless steel, grade 316 Ti /m



DRAWINGS

Technical data sheet
Cable and pipe spacer clip 732



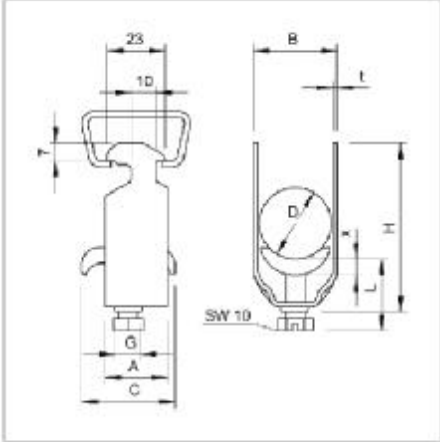
With M6 thread.

Type	Clamping range D mm	Pack. pcs	Weight kg/100 pcs.	Art.-No.
732 6 GTP	5 - 6	100	1.160	1360051
732 8 GTP	7 - 8	100	1.310	1360086
732 10 GTP	9 - 10	100	1.360	1360108
732 12 GTP	10.5 - 12	100	1.460	1360124
732 14 GTP	12.5 - 14	100	1.480	1360140
732 15 GTP	13.5 - 15	100	1.530	1360159
732 16 GTP	14.5 - 16	100	1.590	1360167
732 18 GTP	16.5 - 18	100	1.620	1360183
732 20 GTP	18.5 - 20	50	1.730	1360205
732 22 GTP	20 - 22	50	1.780	1360221
732 24 GTP	22 - 24	50	1.840	1360248
732 26 GTP	24 - 26	50	1.920	1360264
732 28 GTP	26 - 28	50	2.840	1360280
732 30 GTP	28 - 30	50	3.040	1360302
732 33 GTP	31 - 33	25	3.120	1360337
732 35 GTP	33 - 35	25	3.280	1360353
732 38 GTP	36 - 38	25	3.490	1360388
732 40 GTP	38 - 40	25	3.600	1360396
732 42 GTP	40 - 42	25	3.840	1360426
732 45 GTP	43 - 45	25	3.990	1360450
732 48 GTP	46 - 48	25	4.040	1360485
732 50 GTP	48 - 50	25	4.160	1360507
732 60 GTP	58 - 60	25	4.960	1360604
732 63 GTP	61 - 63	25	5.000	1360639

St Steel GTP Electrogalvanised, transparently passivated /100

DRAWINGS

Technical data sheet
Clamp clip, single, metal pressure trough



Suitable for all C profile rails with slot width 16–17 mm.

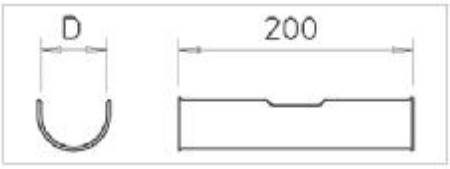
Clamp, bolt and pressure sleeve made of hot-dip galvanised steel.

Type	Clamping range D mm	Pack. pcs	Weight kg/100 pcs.	Art-No.
2056 M 12 FT	8 - 12	100	3.200	1156004
2056 M 16 FT	12 - 16	100	3.500	1156012
2056 M 22 FT	16 - 22	100	4.400	1156020
2056 M 28 FT	22 - 28	100	6.100	1156039
2056 M 34 FT	28 - 34	100	7.700	1156047
2056 M 40 FT	34 - 40	100	8.600	1156055
2056 M 46 FT	40 - 46	100	9.600	1156063
2056 M 52 FT	46 - 52	100	10.400	1156071
2056 M 58 FT	52 - 58	100	13.100	1156098
2056 M 64 FT	58 - 64	100	14.500	1156101
2056 M 70 FT	64 - 70	50	16.100	1156128
2056 M 76 FT	70 - 76	25	18.300	1156136
2056 M 82 FT	76 - 82	25	19.100	1156144
2056 M 90 FT	82 - 90	25	23.300	1156152
2056 M 100 FT	90 - 100	25	25.400	1156160

St Steel FT Hot-dip galvanised /100

DRAWINGS

Technical data sheet
Long trough



CE

In addition to the clamp clip, to increase the support area for cables with integrated function maintenance, a long trough (L = 200 mm) is mounted.

Type	Clamping range D mm	for clip 2056/M	Pack. pcs	Weight kg/100 pcs.	Art.-No.
2058 LW 10	6 - 10	8 - 12	50	4.000	1195794
2058 LW 14	10 - 14	12 - 16	50	5.340	1195808
2058 LW 20	14 - 20	16 - 22	50	7.380	1195816
2058 LW 26	20 - 26	22 - 28	25	9.270	1195824
2058 LW 32	26 - 32	28 - 34	25	11.000	1195832
2058 LW 38	32 - 38	34 - 40	25	12.500	1195840
2058 LW 44	38 - 44	40 - 46	25	14.300	1195859
2058 LW 50	44 - 50	46 - 52	25	16.200	1195867
2058 LW 56	50 - 56	52 - 58	25	17.800	1195875
2058 LW 62	56 - 62	58 - 64	25	19.700	1195883

St Steel FS Strip-galvanised /100

7. FINAL PROVISION

§ This report details the method of construction, the test conditions and results obtained when the specific element of construction described herein was following the procedure outlined in EN 1363-1, and where appropriate STN 92 0205:2012. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.

§ Because of the nature of the fire resistance testing and consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

§ The test results refer only to the tested subjects. This test report is not an approval of the tested product by the test laboratory or the accreditation body overseeing the laboratory's activities. The test was carried out on testing equipment that is the property of FIRES, s.r.o., Batizovce. Without the written permission of the test laboratory this test report may be copied and/or distributed only as the whole. Any modifications of the test report can be made only by the fire resistance test laboratory FIRES, s.r.o., Batizovce.

Approved by:

Ing. Štefan Rástocký
leader of the testing laboratory

SKÚŠOBNÉ LABORATÓRIUM • TESTING LABORATORY • PRÜFLABORATORIUM
FIRES
The Experts on Fire Safety
-1-

Prepared by:

Bc. Dávid Šubert
technician of the testing laboratory

8. NORMATIVE REFERENCES

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

THE END OF THE TEST REPORT