FUNCTIONAL RESISTANCE IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION FIRES-JR-146-22-NURE

Cable supporting system of Niedax with power and communication cables of Technokabel S.A.

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FUNCTIONAL RESISTANCE IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION IN ACCORDANCE WITH ČSN 73 0895: 2016

FIRES-JR-146-22-NURE

Name of the product:	Cable supporting system of Niedax with power and communication cables of Technokabel S.A.
Sponsor:	Niedax GmbH & Co. KG Asbacher Strasse 141 Linz am Rhein D-53545 Germany
Prepared by:	FIRES, s.r.o. Approved Body No. SK01 Osloboditeľov 282 059 35 Batizovce Slovak Republic
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1. INTRODUCTION

This expert judgement report with classification defines the functional resistance in fire classification assigned to element Cable supporting system of Niedax with power and communication cables of Technokabel S.A. in accordance with the classes given in ČSN 73 0895: 2016.

Deviations from standard at the test according to ČSN 73 0895: 2016: This test was carried out according to standard STN 92 0205 and meets also all requirements of ČSN 73 0895: 2016 and test results can be directly used for classification of tested cables according to ČSN 73 0895: 2016. There are no deviations identified in process and carrying out of test.

This expert judgement report defines field of direct application and field of extended application according test standard.

This product has already been classified by FIRES, s.r.o. and number of previous fire resistance expert judgement report with classification is FIRES-JR-151-17-NURE (issued on 06. 12. 2017) with validity until 06. 12. 2022. Document FIRES-JR-146-22-NURE replaces expert judgement report with classification FIRES-JR-151-17-NURE.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, Cable supporting system of Niedax with power and communication cables of Technokabel S.A., is defined as a cable supporting system with cables with circuit integrity maintenance classes.

2.2 PRODUCT DESCRIPTION

Product comprise of cable supporting system NIEDAX – cable trays, mesh trays, ladders with accessories (consoles, brackets, supports, hangers, etc.) and power and communication halogen free cables of company Technokabel S.A..

Cable supporting system:

Cable tray RLVC 60

Cable tray is made of steel sheet thickness 0,75 mm, 0,8 mm or 0,9 mm thick. Height of side wall is 60 mm and maximum tested width is 400 mm. Trays are fixed together by integrated plug-in connectors and nut bolts (FLM 6x12) or alternatively by connectors RVV50 with same nut bolts. Maximum tested loading is 20kg.m⁻¹. Tested cable trays are RLVC 60.300 and RLVC 60.400.

Cable tray RL 110

Cable tray is made of steel sheet thickness 0,8 mm, 0,9 mm or 1,0 mm thick. Height of side wall is 110 mm and maximum tested width is 400 mm. Trays are fixed together by connectors (RV 110.400) with nut bolts (FLM 6x12). Maximum tested loading is 20kg.m⁻¹. Tested cable tray is RL 110.400.

Cable mesh tray MTC 54

Cable mesh tray is made of longitudinal steel wires either \emptyset 3,9 mm or \emptyset 4,8 mm and transverse steel wires \emptyset 3,9 mm, \emptyset 4,8 mm or \emptyset 5,8 mm. Height of side wall is 54 mm and maximum tested width of cable mesh tray is 400 mm. Mesh trays are fixed together by integrated plug-in connectors or alternatively by nut bolts GRHKM 6x15. Maximum tested loading is 15kg.m⁻¹. Tested mesh tray is MTC 54.400.

Cable ladder STL 60

Cable ladder is made of steel sheet thickness 1,5 mm and spacing of transoms is 300 mm. Cross-section dimensions of transoms are (30 x 15 x 1,5) mm. Height of side wall is 60 mm and maximum tested width of cable ladder is 400 mm. Cable ladders are fixed together by two side connectors (KLVB 60/4) with nut bolts (FLM8x13, 4 pcs per connector). Maximum tested loading is 20kg.m⁻¹. Tested ladder is STL 60.403.



C-profile 2970

Profile with dimensions (30×15) mm is made of bent steel sheet 1,5 mm thick. Profile is used for fixing of cables to ceiling and wall by cable clips.

C-profile 2987

Profile with dimensions (48×22) mm is made of bent steel sheet 1,75 mm thick. Profile is used for suspension of trays and ladders.

Console HU 5050

Console consists of base plate with dimensions (140 x 80 x 5) mm and support with dimensions (50 x 50 x 2,5) mm. Console is used for gripping of brackets to ceiling.

Bracket KTA and KTAG

Bracket consists of two parts – base plate (from 4,0 to 6,0 mm thick) and bent steel sheet (from 1,5 to 2,0 mm thick) welded together. Brackets are used for fixation of trays and ladders.

Support TAH

Support consists of two parts and is made of bent steel sheet 4,0 mm thick and 30 mm wide. Support is used for suspension of trays and ladders.

Trapezoidal hanger DBT 40

Hanger is made of bent steel sheet 1,5 mm thick.

Spacer HDS

Spacer is made of bent steel sheet 1,5 mm thick with dimensions (80 x 43) mm. Spacers are used for reinforcement of consoles at place of brackets fixation.

Cable clip SAS

Cable clip consists of two parts made of bent steel sheet from 1,2 to 2,0 mm thick and is used for fixation of cables to ceiling or wall.

Cable clamps "B"

Cable clamp consists of two parts made of bent steel sheet from 1,5 to 2,0 mm thick and is used for fixation of cables to ceiling or wall.

All parts of cable supporting systems are made of galvanized steel acc. to EN ISO 1461 and pre-galvanised sheet steel acc. to EN 10346.

Steel chains were used for additional loading of tracks.

Cables

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).

Fire resistant and halogen free communication cables are intended for installation in alarm, signaling, 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 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 – data are transmitted and power is supplied to equipment which must operate in fire conditions and during firefighting (e.g. emergency lighting, smoke removing fans). 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.



Cables used by test:

Power cables: NHXH FE180 PH30/E30 0.6/1 kV NHXH FE180 PH90/E90 0.6/1 kV NHXCH FE180 PH90/E90 0.6/1 kV (N)HXH FE180 PH30/E30 0.6/1 kV (N)HXH FE180 PH90/E90 0.6/1 kV (N)HXCH FE180 PH90/E90 0.6/1 kV (N)HXCH-J-SERVO FE180 PH90/E90 0.6/1 kV

Communication cables: HTKSH FE180 PH90/E30-E90 240 V HTKSHekw FE180 PH90/E30-E90 240 V HDGs FE180 PH90/E30-E90 300/500 V HDGs-W FE180 PH90/E30-E90 300/500 V HLGs FE180 PH90/E30-E90 300/500 V JE-H(St)H Bd FE180/E30-E90 240 V

The length of cables was 5,2 m and 4,0 m from that was exposed to fire.

More detailed information about product construction is shown in the drawings which form an integral part of test report [1]. Drawings were delivered by sponsor.







Assembly of the tested structure, more information in the test report [1].





Assembly of the tested structure, more information in the test report [2].

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3. TEST REPORTS AND EXTENDED APPLICATION REPORTS IN SUPPORT OF CLASSIFICATION

3.1 TEST REPORTS AND EXTENDED APPLICATION REPORTS

No.	Name of laboratory	Name of sponsor	Test report No.	Date of the test	Test method
[1]	FIRES, s.r.o.,	Niedax GmbH & Co. KG,	FIRES-FR-066-17-AUNE	19. 07. 2017	STN 92
[2]	Batizovce, SR	Linz am Rhein, DE	FIRES-FR-192-17-AUNE	19. 10. 2017	0205

3.2 TEST RESULTS

No./ Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1]	1	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV	15	76 minutes
[']	2	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	13	90 minutes no failure / interruption
STN 92 0205	3	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV	14	65 minutes
2014	4	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV	14	37 minutes
	5	2 cables (N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV	12	86 minutes
	6	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	13	90 minutes no failure / interruption
	7	2 cables NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV	12	32 minutes
	8	2 cables NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV	12	86 minutes
	9	2 cables (N)HXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV	44	90 minutes no failure / interruption
	10	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV		68 minutes
	11	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV	10	90 minutes no failure / interruption
	12	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV	10	44 minutes
	13	2 cables (N)HXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV	•	90 minutes no failure / interruption
	14	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV	9	43 minutes
	15	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	16	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV		33 minutes
	17	2 cables NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	0	90 minutes no failure / interruption
	18	2 cables NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	19	2 cables (N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	20	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	-	90 minutes no failure / interruption
	21	2 cables NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	· ·	90 minutes no failure / interruption
	22	2 cables NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	23	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV		90 minutes no failure / interruption
	24	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV	46	90 minutes no failure / interruption
	25	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	10	90 minutes no failure / interruption
	26	2 cables (N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	27	2 cables NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV	6	31 minutes
	28	2 cables NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV	0	90 minutes no failure / interruption
	29	2 cables NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	E	90 minutes no failure / interruption
	30	2 cables NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV	5	90 minutes no failure / interruption
	31	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	32	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	4	45 minutes
	33	2 cables NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV		90 minutes no failure / interruption

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No./ Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1]	34	2 cables NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
0.71	35	2 cables NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV	3	74 minutes
STN 92 0205:	36	2 cables NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV	J	37 minutes
2014	37	2 cables NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	38	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV	2	90 minutes no failure / interruption
	39	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	-	84 minutes
	40	2 cables NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV		90 minutes no failure / interruption
	41	2 cables (N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV	-	90 minutes no failure / interruption
	42	2 cables NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV	1	90 minutes no failure / interruption
	43	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	-	90 minutes no failure / interruption
	44	2 cables NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	45	2 cables NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	46	2 cables NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	16	90 minutes no failure / interruption
	47	2 cables NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	48	2 cables NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	52	2 cables JE-H(St)H Bd FE180/E30-E90 1x2x0.8 mm 240 V	15	24 minutes
	53	2 cables HLGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V		30 minutes
	54	2 cables HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V	12	90 minutes no failure / interruption
	55	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V	10	90 minutes no failure / interruption
	56	2 cables HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V		90 minutes no failure / interruption
	57	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V		90 minutes no failure / interruption
	58	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	16	90 minutes no failure / interruption
	59	2 cables HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V		90 minutes no failure / interruption
	60	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V		90 minutes no failure / interruption
	61	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	9	61 minutes
	62	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V		31 minutes
	63	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	8	90 minutes no failure / interruption
	64	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	7	90 minutes no failure / interruption
	65	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	6	35 minutes
	66	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V		89 minutes
	67	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	5	90 minutes no failure / interruption
	68	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	4	90 minutes no failure / interruption
	69	2 cables HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V	_	90 minutes no failure / interruption
	70	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	3	90 minutes no failure / interruption
	71	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V		51 minutes
	72	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	2	90 minutes no failure / interruption
	73	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	1	90 minutes no failure / interruption
[2]	1	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV	15	90 minutes no failure / interruption
STN	2	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV		90 minutes no failure / interruption
92 0205:	3	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV	14	90 minutes no failure / interruption
2014	4	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	5	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV	-	90 minutes no failure / interruption
	6	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	13	90 minutes no failure / interruption
	7	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	8	2 cables (IN)HXH-J FE180 PH90/E90 4X1.5 RE 0.6/1 KV		90 minutes no failure / interruption
	9		12	30 minutes no failure / interruption

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No./ Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[2]	11	2 cables NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	11	90 minutes no failure / interruption
[4]	12	2 cables NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
STN 92 0205:	13	2 cables NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	10	90 minutes no failure / interruption
2014	14	2 cables NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV	10	90 minutes no failure / interruption
	15	2 cables (N)HXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV	•	87 minutes
	16	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV	9	90 minutes no failure / interruption
	17	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV	0	90 minutes no failure / interruption
	18	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV	°	75 minutes
	19	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	20	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	_	90 minutes no failure / interruption
	21	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	22	2 cables (N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	23	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	24	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV		88 minutes
	25	2 cables (N)HXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	26	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	16A	90 minutes no failure / interruption
	27	2 cables (N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	28	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	29	2 cables NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV	_	28 minutes
	30	2 cables NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV	6	90 minutes no failure / interruption
	31	2 cables NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	32	2 cables NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV		90 minutes no failure / interruption
	33	2 cables NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	5	47 minutes
	34	2 cables NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		48 minutes
	35	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV		81 minutes
	36	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV	_	90 minutes no failure / interruption
	37	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	4	90 minutes no failure / interruption
	38	2 cables (N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV		90 minutes no failure / interruption
	39	2 cables NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV		28 minutes
	40	2 cables NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV	3	90 minutes no failure / interruption
	41	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV		9 minutes
	42	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV	2	90 minutes no failure / interruption
	43	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	_	90 minutes no failure / interruption
	44	2 cables (N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV		90 minutes no failure / interruption
	45	2 cables (N)HXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV	1	90 minutes no failure / interruption
	46	2 cables NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV		85 minutes
	47	2 cables NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV	_	90 minutes no failure / interruption
	48	2 cables NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV	- 16	90 minutes no failure / interruption
	49	2 cables NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV	_	90 minutes no failure / interruption
	52	2 cables JE-H(St)H Bd FE180/E30-E90 1x2x0.8 mm 240 V	1	62 minutes
	53	2 cables HLGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	15	90 minutes no failure / interruption
	54	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V		90 minutes no failure / interruption
	55	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	14	90 minutes no failure / interruption
	56	2 cables HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V	13	90 minutes no failure / interruption



No./ Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[2]	57	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V	12	90 minutes no failure / interruption
[ک]	58	2 cables HDGs-W FE180 PH90/E30-E90 2x1 mm 2 300/500 V	11	90 minutes no failure / interruption
STN 92 0205:	59	2 cables HDGs FE180 PH90/E30-E90 2x1 mm 2 300/500 V	10	25 minutes
2014	60	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	•	28 minutes
	61	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	9	59 minutes
	62	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V	•	46 minutes
	63	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	•	44 minutes
	64	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V		90 minutes no failure / interruption
	65	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	164	90 minutes no failure / interruption
	66	2 cables HDGs-W FE180 PH90/E30-E90 $2x1 \text{ mm}^2 300/500 \text{ V}$	IOA	90 minutes no failure / interruption
	67	2 cables HDGs FE180 PH90/E30-E90 2x1 mm2 300/500 V		90 minutes no failure / interruption
	68	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V	6	90 minutes no failure / interruption
	69	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0.8 mm 240 V	0	90 minutes no failure / interruption
	70	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	5	33 minutes
	71	2 cables HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V		90 minutes no failure / interruption
	72	2 cables HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V	3	90 minutes no failure / interruption
	73	2 cables HTKSH FE180 PH90/E30-E90 1x2x0.8 mm 240 V]	72 minutes

- [1] The fire test was terminated in the 94th minute upon request of test sponsor. Specimens S1 – S48 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Specimens S52 – S73 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W. Circuit breakers with rating 3 A were used.
- [2] The fire test was terminated in the 94th minute upon request of test sponsor. Specimens S1 – S49 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Specimens S52 – S73 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W. Circuit breakers with rating 3 A were used.



4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 CLASSIFICATION ACCORDING TO ČSN 73 0895: 2016

The element, **Cable supporting system of Niedax with power and communication cables of Technokabel S.A.**, is classified according to the following combinations of performance parameters and classes as appropriate.

Cable	Type of tested cable, single cross- sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable
NHXH FE180	NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5 mm ²
PH90/E90 0,6/1 kV	NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]		P 90-R	P 90-R
NHXCH FE180	NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5/1,5 mm ²
PH90/E90 0,6/1 kV	NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV [1]		P 90-R	P 90-R
(N)HXH FE180	(N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5 mm ²
PH90/E90 0,6/1 kV	(N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]	Consoles HU 5050, brackets KTA 400,	P 90-R	P 90-R
(N)HXCH FE180	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]	spacers HDS 5050. Loading 15kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard systems No. 1 and 2 [1] No. 2 [2]	P 90-R	n x ≥1,5 mm ²
PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	P 90-R
(N)HXCH-J- SERVO	(N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		Without classification	Without
PH90/E90 0,6/1 kV	(N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	classification
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
NHXH FE180	NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [1]		P 30-R	n x ≥1,5 mm ²
PH30/E30 0,6/1 kV	NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [1]	Cable tray RLVC 60.400. Consoles combined of C-profile 2986 and threaded rods M10. Fixation to ceiling by suspension devices DBG12. Loading 10kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard system No. 3 [1]	P 60-R	P 30-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 45-R	n x 2 x ≥0,8 mm n ≥1 P 45-R
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
HDGs-W FE180 PH90/E30-E90 300/500V	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R



Cable	Type of tested cable, single cross- sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable
NHXH FE180	NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [2]		P 15-R	n x ≥1,5 mm²
PH30/E30 0,6/1 kV	NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [2]		P 90-R	P 15-R
(N)HXH FE180	(N)HXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [2]		P 60-R	n x ≥1,5 mm²
PH30/E30 0,6/1 kV	(N)HXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [2]	Cable tray RL 110.400.	P 90-R	P 60-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]	C-profile 2986 and threaded rods M10. Fixation directly to ceiling. Loading 20kg.m ⁻¹ .	P 15-R	n x 2 x ≥0,8 mm n ≥1 P 15-R
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]	Consoles in spacing of 1500 mm. Non-standard system No. 3, 9 and 12 [2]	P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 45-R	n x ≥1,0 mm² n ≥2 P 45-R
HDGs-W FE180 PH90/E30-E90 300/500V	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
NHXH FE180	NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5 mm²
PH90/E90 0,6/1 kV	NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]		P 90-R	P 90-R
NHXCH FE180	NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5/1,5 mm ²
PH90/E90 0,6/1 kV	NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV [1]		P 90-R	P 90-R
(N)HXH FE180	(N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]	Cable mesh tray MTC 54.400. Consoles combined of	P 90-R	n x ≥1,5 mm ²
PH90/E90 0,6/1 kV	(N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]	C-profile 2986 and threaded rods M10. Fixation to supporting	P 90-R	P 90-R
(N)HXCH FE180	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]	hangers DBT40 and threaded rods M10.	P 90-R	n x ≥1,5 mm ²
PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [2]	Loading 15kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard systems No. 4 – 5 and 13 – 14 [1] No. 4 [2]	P 90-R	P 90-R
(N)HXCH-J- SERVO	(N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 60-R	n x ≥1,5 mm²
FE180 PH90/E90 0,6/1 kV	(N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	P 60-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HDGs FE180 PH90/E30-E90 300/5001/	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R

¹⁾ Supporting construction is made of segments of steel sheets 1,2 mm thick bent to wave 550 mm long. Individual segments are fixed to ceiling by 4 pcs of anchors in spacing of 1500 mm.



Cable	Type of tested cable, single cross- sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable	
NHXH FF180	NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [1]		P 30-R	n x ≥1,5 mm²	
PH30/E30 0,6/1 kV	NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [1]		P 90-R	n ≥1 P 30-R	
(N)HXCH FE180	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 60-R	n x ≥1,5 mm²	
PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [1]	Consoles combined of C-profile 2986 and threaded	P 90-R	P 60-R	
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]	rods M10. Fixation to supporting construction ¹⁾ by trapezoidal hangers DBT40 and threaded rods M10. Loading 10kg.m ¹ . Consoles in spacing of 1500 mm. Non-standard systems No. 6 and 15 [1]	P 30-R	n x 2 x ≥0,8 mm n ≥1 P 30-R	
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 60-R	n x 2 x ≥0,8 mm n ≥1 P 60-R	
HLGs FE180 PH90/E30-E90 300/500V	HLGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]			P 30-R	n x ≥1,0 mm² n ≥2 P 30-R
JE-H(St)H Bd FE180/E30-E90 240V	JE-H(St)H Bd FE180/E30-E90 1x2x0,8 mm 240 V [1]		P 15-R	n x 2 x ≥0,8 mm n ≥1 P 15-R	
NHXH FE180 PH90/E90 0,6/1 kV	NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]	Cable tray RLVC 60.400. Consoles combined of C-profile 2986 and threaded rods M10. Fixation to supporting construction ¹⁾ by trapezoidal hangers DBT40 and	P 45-R	n x ≥1,5 mm²	
	NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 45-R	P 45-R	
NHXCH FE180	NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5/1,5 mm ²	
PH90/E90 0,6/1 kV	NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV [2]		P 90-R	P 90-R	
(N)HXH FE180	(N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5 mm²	
PH90/E90 0,6/1 kV	(N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	P 90-R	
(N)HXCH FE180	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5 mm ²	
PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	P 90-R	
(N)HXCH-J- SERVO	(N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]	threaded rods M10. Loading 20kg.m ⁻¹ . Consoles in spacing of 1500 mm	P 90-R	n x ≥1,5 mm ²	
PH90/E90 0,6/1 kV	(N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV [2]	Non-standard systems No. 5, 13 and 14 [2]	P 90-R	P 90-R	
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 30-R	n x ≥1,0 mm ² n ≥2 P 30-R	
HDGs-W FE180 PH90/E30-E90 300/500V	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R	
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R	
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R	



Cable	Type of tested cable, single cross- sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable
NHXH FE180	NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [2]		P 15-R	n x ≥1,5 mm²
PH30/E30 0,6/1 kV	NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [2]		P 90-R	P 15-R
(N)HXCH FE180	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]	Cable tray PL 110 400	P 90-R	n x ≥1,5 mm²
PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [2]	Consoles combined of C-profile 2986 and threaded	P 90-R	P 90-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]	rods M10. Fixation to supporting construction ¹⁾ by trapezoidal hangers DBT40 and threaded rods M10. Loading 20kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard systems No. 6 and 15 [2]	P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HLGs FE180 PH90/E30-E90 300/500V	HLGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
JE-H(St)H Bd FE180/E30-E90 240V	JE-H(St)H Bd FE180/E30-E90 1x2x0,8 mm 240 V [2]		P 60-R	n x 2 x ≥0,8 mm n ≥1 P 60-R
NHXH FE180	NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]	Cable ladder STL 60.403. Consoles HU 5050,	P 90-R	n x ≥1,5 mm ²
PH90/E90 0,6/1 kV	NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]		P 90-R	P 90-R
NHXCH FE180	NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5/1,5 mm ²
PH90/E90 0,6/1 kV	NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV [1]		P 90-R	P 90-R
(N)HXH FE180	(N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]	brackets KTAG 400, threaded rods M10, spacers HDS5050.	P 90-R	n x ≥1,5 mm²
PH90/E90 0,6/1 kV	(N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]	Loading 20kg.m ⁻¹ . Consoles in spacing of 1500 mm.	P 90-R	P 90-R
(N)HXH FE180	(N)HXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [1]	No. 7, 8, 10 and 11 [1] No. 1 [2]	P 90-R	n x ≥1,5 mm²
PH30/E30 0,6/1 kV	(N)HXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [1]		P 60-R	P 60-R
(N)HXCH FE180	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5 mm²
PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	n ≥1 P 90-R

¹⁾ Supporting construction is made of segments of steel sheets 1,2 mm thick bent to wave 550 mm long. Individual segments are fixed to ceiling by 4 pcs of anchors in spacing of 1500 mm.



Cable	Type of tested cable, single cross- sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable
(N)HXCH-J- SERVO	(N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5 mm²
PH90/E90 0,6/1 kV	(N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	P 90-R
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]	Cable ladder STL 60.403. Consoles HU 5050, brackets KTAG 400, threaded rods M10, spacers HDS5050. Loading 20kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard systems No. 7, 8, 10 and 11 [1] No. 1 [2]	P 90-R	n x ≥1,0 mm² n ≥ 2 P 90-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HDGs-W FE180 PH90/E30-E90 300/500V	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
(N)HXH FE180	(N)HXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [1]	Cable tray RLVC 60.400. Consoles HU 5050, brackets KTAG 400, threaded rods M10, spacers HDS5050. Loading 10kg.m ¹ . Consoles in spacing of 1500 mm.	P 90-R	n x ≥1,5 mm²
PH30/E30 0,6/1 kV	(N)HXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [1]		P 30-R	P 30-R
NHXH FE180	NHXH-J FE180 PH30/E30 4x1.5 RE 0.6/1 kV [1]		P 30-R	n x ≥1,5 mm²
PH30/E30 0,6/1 kV	NHXH-J FE180 PH30/E30 4x50 RM 0.6/1 kV [1]		P 60-R	P 30-R
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 30-R	n x ≥1,0 mm² n ≥2 P 30-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]	No. 9 and 12 [1]	P 60-R	n x 2 x ≥0,8 mm n ≥1 P 60-R
HDGs-W FE180 PH90/E30-E90 300/500V	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm ² n ≥2 P 90-R
NHXH FE180	NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5 mm²
PH90/E90 0,6/1 kV	NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	P 90-R
(N)HXH FF180	(N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5 mm²
PH90/E90 0,6/1 kV	(N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [2]	Cable tray RLVC 60.300. Supports TAH-D 300/500.	P 90-R	n ≥1 P 90-R
NHXCH FE180	NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV [2]	Consoles in spacing of 1500 mm. Non-standard systems No. 7, 8, 10 and 11 [2]	P 90-R	n x ≥1,5/1,5 mm²
PH90/E90 0,6/1 kV	NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV [2]		P 90-R	n ≥1 P 90-R
(N)HXCH FF180	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]	1	P 90-R	n x ≥1,5 mm²
FE180 PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	n ≥1 P 90-R

¹⁾ Supporting construction is made of segments of steel sheets 1,2 mm thick bent to wave 550 mm long. Individual segments are fixed to ceiling by 4 pcs of anchors in spacing of 1500 mm.



Cable	Type of tested cable, single cross- sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable
(N)HXCH-J- SERVO	(N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]	Cable tray RLVC 60.300. Supports TAH-D 300/500. Loading 15kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard systems No. 7, 8, 10 and 11 [2]	P 60-R	n x ≥1,5 mm ²
PH90/E90 0,6/1 kV	(N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	P 60-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]		P 30-R	n x 2 x ≥0,8 mm n ≥1 P 30-R
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]		P 45-R	n x 2 x ≥0,8 mm n ≥1 P 45-R
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 15-R	n x ≥1,0 mm² n ≥2 P 15-R
HDGs-W FE180 PH90/E30-E90 300/500V	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
NHXH FE180 PH90/E90 0,6/1 kV	NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]	Track made of C-profiles 2970 fixed to ceiling in spacing of 600 mm. Cables are fixed to profiles by cable yoke clamps type "B". Non-standard systems No. 16 [1]	P 90-R	n x ≥1,5 mm² n ≥1 P 90-R
	NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]		P 90-R	
NHXCH FE180 PH90/E90 0,6/1 kV	NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5/1,5 mm² n ≥1 P 90-R
	NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV [1]		P 90-R	
(N)HXH FE180 PH90/E90 0,6/1 kV	(N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5 mm² n ≥2 P 90-R
	(N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [1]		P 90-R	
(N)HXCH FE180 PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [1]		P 90-R	n x ≥1,5 mm² n ≥1 P 90-R
	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [1]		P 90-R	
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
HDGs-W FE180 PH90/E30-E90 300/500V	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [1]		P 90-R	n x ≥1,0 mm ² n ≥2 P 90-R
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [1]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R



Cable	Type of tested cable, single cross- sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable
NHXH FE180 PH90/E90 0,6/1 kV	NHXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]	Track made of C-profiles 2970 fixed to ceiling in spacing of 600 mm. Cables are fixed to profiles by cable clips SAS. Non-standard systems No. 16 [2]	P 90-R	n x ≥1,5 mm² n ≥1 P 90-R
	NHXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	
(N)HXH FE180 PH90/E90 0,6/1 kV	(N)HXH-J FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5 mm² n ≥1 P 90-R
	(N)HXH-J FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	
NHXCH FE180 PH90/E90 0,6/1 kV	NHXCH FE180 PH90/E90 4x1.5/1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5/1,5 mm² n ≥1 P 60-R
	NHXCH FE180 PH90/E90 4x50/25 RM 0.6/1 kV [2]		P 60-R	
(N)HXCH FE180 PH90/E90 0,6/1 kV	(N)HXCH FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 90-R	n x ≥1,5 mm ² n ≥1 P 90-R
	(N)HXCH FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	
(N)HXCH-J- SERVO FE180 PH90/E90 0,6/1 kV	(N)HXCH-J-SERVO FE180 PH90/E90 4x1.5 RE 0.6/1 kV [2]		P 60-R	n x ≥1,5 mm² n ≥1 P 60-R
	(N)HXCH-J-SERVO FE180 PH90/E90 4x50 RM 0.6/1 kV [2]		P 90-R	
HTKSH FE180 PH90/E30-E90 240V	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HTKSHekw FE180 PH90/E30-E90 240V	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm 240 V [2]		P 90-R	n x 2 x ≥0,8 mm n ≥1 P 90-R
HDGs FE180 PH90/E30-E90 300/500V	HDGs FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R
HDGs-W FE180 PH90/E30-E90	HDGs-W FE180 PH90/E30-E90 2x1 mm ² 300/500 V [2]		P 90-R	n x ≥1,0 mm² n ≥2 P 90-R

The element, Cable supporting system of Niedax with power and communication cables of Technokabel S.A. with circuit integrity maintenance classes are classified to classes according to achieved test results of tested cables at tracks. Other classification is not allowed.

4.2 FIELD OF DIRECT APPLICATION

This classification is valid for the following end use applications:

General

- cable track functionality shall not be affected negatively by adjacent building or technological elements, another cable tracks, piping tracks or other technological device;
- test results are applicable only in case the cable track in practice will be fixed to a building construction which is sufficient in term of its statics performance for period of functionality in fire, i. e. the element meets the loadbearing criterion R according to ČSN EN 13501-2;
- if the cable track is fixed directly to a building construction element made of material such as concrete, bricks, aerated concrete or steel supporting structure, such anchoring components shall be used, which, in term of their properties, are suitable with respect to used material, used installation method, required thermal attack curve, required period of functionality in fire, mechanical actions caused by cable support construction with cables;



- the cable track can be fixed for example by means of bolted joints, riveted joints, welded joints, joints of direct assembling (inserting). Suitability of fixing type for the purpose shall be demonstrated by a test or statics calculation;
- if it is not possible to fix the cable route directly to element of building construction, an additional construction may be used. Design of such construction shall apply all principles for projection of cable support construction withstanding the fire effects for specified period. It is possible to verify the additional construction properties by means of a calculation in accordance with Eurocodes or by a test. When fixing the additional construction to an element of building construction all requirements given in previous clauses apply.
- the number of cables placed on the cable support construction in horizontal arrangement is limited just by area disposition, but the maximal load acting on the cable support construction, stated by manufacturer, shall not be exceeded. Manufacturer specification of the number of cables, if available, shall also be respected;
- if cables run freely they need not be fixed by clips when they are arranged horizontally on trays or ladders;
- on their whole length the cables shall be installed in such a manner, that the minimal bend radius stated by manufacturer is observed;
- also cables without functionality in fire may be placed on cable system together with cables with functionality in fire but only under the condition, that minimum distance of 200 mm is observed between them or they are separated by means of suitable fire screen. In addition the common cable management is possible only in case when each power cable or conductor is insulated to maximal voltage used in power management system;
- communication, data and signal cables shall be placed in such a way, that at all events a distance minimum of 100 mm is provided between those cables and power cables;

When the cable routes are installed in sloped or vertical position following shall be met:

- in points where it turns from horizontal to other orientation the cable route shall be effectively attached and in orientation other than horizontal the cables shall be fixed firmly also in places of bending whereas the allowable support position maximal distances and the allowable minimal bend radius are retained;
- cable tracks installed in arrangement with the angle between the horizontal plane and their longitudinal axis is less than 20° are considered as horizontal;

Cables and cable support systems

- test results are applicable to tested cable route, it means to combination of type, cross-section and manufacturer of the cable and of type and manufacturer of the cable support system. Further direct application possibilities are given in following statements.

Test results for power cables are directly applicable as follows:

- where test specimens according to ČSN 73 0895 are used, the worst test result obtained from testing of these specimens applies to all dimensions and tested arrangement method of tested cable;
- if cables with maximal cross-section of the core less than 50 mm² are tested, the worst test result applies to all cross-sections of cables in range of tested cross-sections;
- test result obtained from testing of cables with five or four conductors applies also to cables of the same type with smaller or greater number of conductors;
- in case only cables with minimal or maximal tested cross-section passed successfully the test, the test result is applicable only to the same type of cable, section and arrangement method as tested;

Test results obtained from testing of communication or signal cables are directly applicable as follows:

- test results are applicable to all constructions of specified type with diameter (cross-section) and number of cores equal to or greater than that of test specimen;

Test results obtained from testing of metallic data cables are directly applicable as follows:

 test results from perimeter integrity test apply for tested arrangement method for all dimensions of specified type with diameter (cross-section) and number of cores equal to or greater than that of test specimen;

Test results for cable supports systems are directly applicable as follows:

- test results obtained from testing of installation on cable trays or cable ladders suspended on floor suspension devices are allowed to be applied to support constructions attached to a wall;
- In case the test was carried out with cable tray or ladder with jointing point placed in the middle between support constructions (± 5 % of their distance) the test results apply to any position of jointing point between support constructions;
- test results from test with specimen of cable trays or ladders are applicable also to event when the surface is treated with a colour painting or spraying in layer of surface density < 1,0 kg/m² or of thickness



< 1,0 mm in accordance with ČSN EN 13501-1. When the thickness or surface density of this layer is of greater value it is necessary to carry out a test according to this standard;

- when test specimens of support constructions made in conformity with EN 61537 ed. 2 form steel with surface treatment are used, the test results are directly applicable to support constructions of the same type made of stainless steel but not vice versa. However, it is necessary to demonstrate the mechanical characteristics of stainless steel in range of test temperatures are equal to or greater than those of steel used in test specimens.

For non-standard cable support constructions the test results are directly applicable as follows:

- results from tests carried out on cable trays and cable ladders are applicable to all cable trays and cable ladders of identical construction of smaller width than tested.
- direct application of test results from test on a test specimen is not possible to different design nor to any other product made by another manufacturer;

4.3 FIELD OF EXTENDED APPLICATION

- test result obtained for test specimen of cable tray lengths and cable ladder lengths is applicable to all parts of system, which are used for changing of direction and dimension or for ending of lengths. Typical examples of system parts are elbows, T shaped parts, cross-over parts;
- application of test results for cable tray jointing and cable ladder jointing other than as specified in standard;
- test results obtained for cable system with cable trays are applicable also for usage of coverings of cable trays. However these shall be ensured against movement. It is necessary to include the cover mass into overall load;
- application of test results to different fire scenario than used in test. However, the fire scenario upon which the test results are to be applied shall be as follows: its temperature value for each point of the temperature-time curve has to be lower than respective temperature value for fire scenario used in the test at the same time. When comparing two fire scenarios, it is possible to move the scenarios (their courses) each other along the time axis;

4.4 LABELING OF CABLE TRACK

The contractor shall always label the cable track at the accessible place and by permanent way. Label contains following information:

- the name of individual or legal person whose workers have installed the system;
- indication of cable bearing system which is stated in classification report;
- class of function in fire, number of classification report;
- year of installation of cable bearing system.

If the track is long, it is appropriate to repeat the labelling approximately every 50 m.



7. LIMITATIONS

This classification document does not represent type approval or certification of the product.

The classification is valid provided that the product, field of application and standards and regulations are not changed.

Approved by:

Ing. Štefan Rástocký Chief Operating Officer

Prepared by:

Technician of the Testing Laboratory

