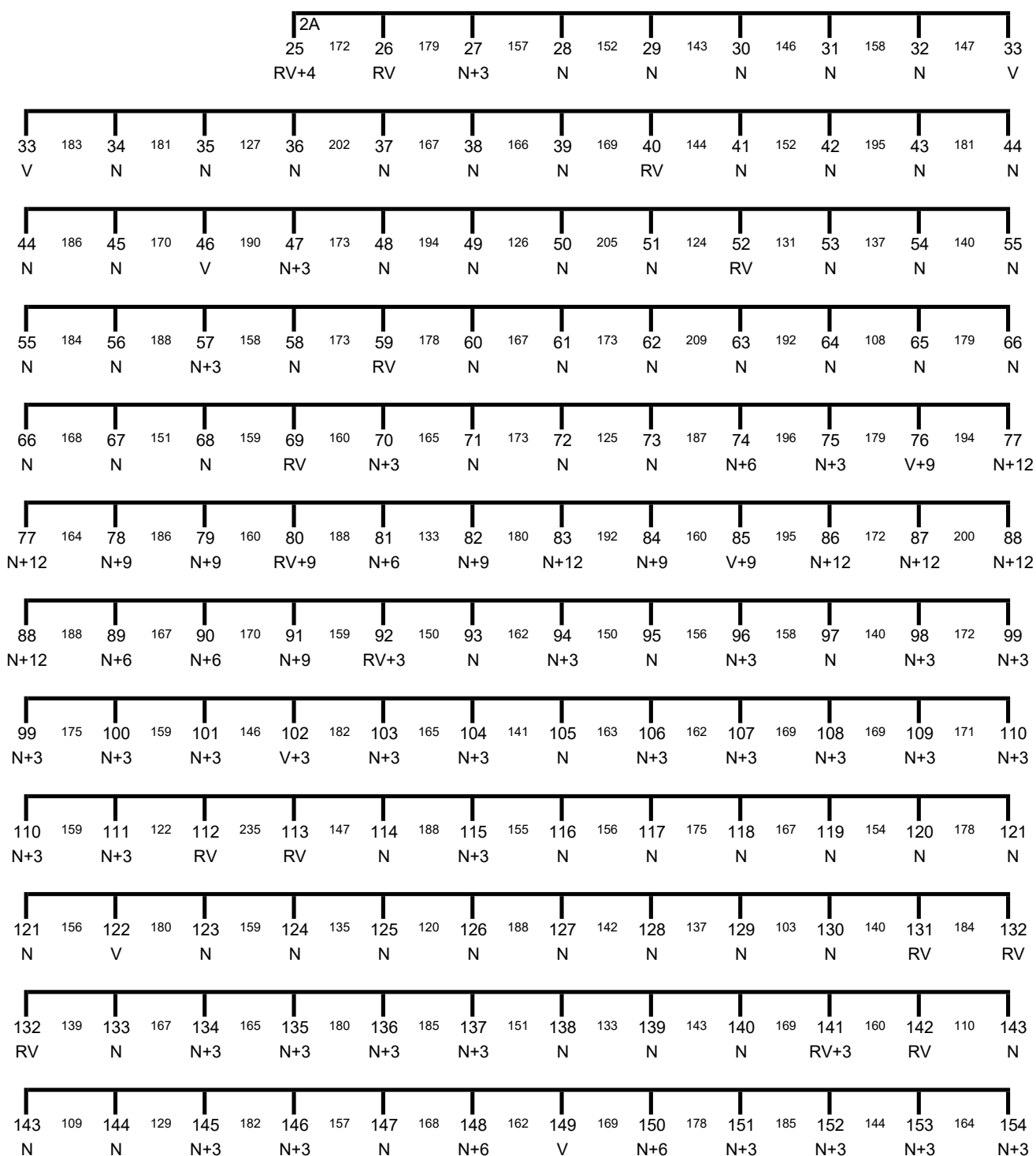


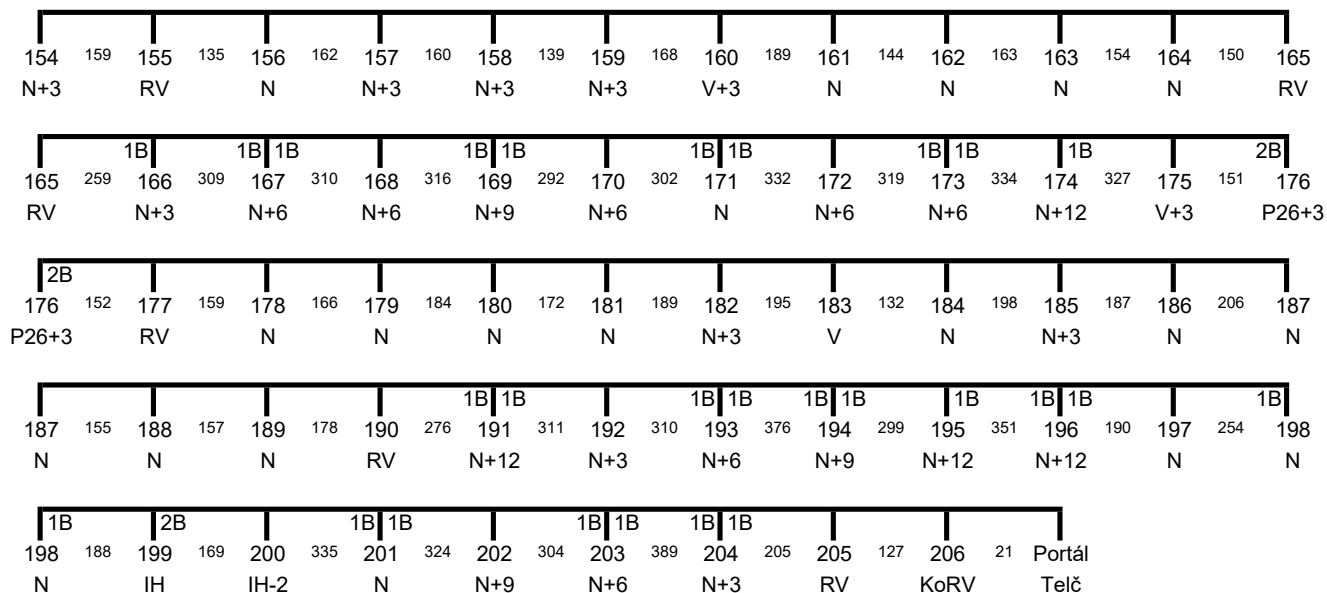
A - tlumič vibrací B161001A01

2 ks na vodič / 6 ks na vedení

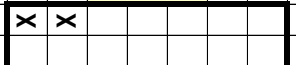



B - tlumič vibrací B161002A02

33 ks na vodič / 99 ks na vedení





Damper distribution chart

										project:		110 kV OHTL V5522																																																																													
										conductor:		1 x 3 x 184-AL1/30-ST1A (Ø19,0)																																																																													
span length [m]										172,5																																																																															
EDS(10°C) [N/mm²]										43,05																																																																															
																				dampers per conductor: 2 x B161001A01																																																																					
tower No.										25										26										total (3 x) : 6 x B161001A01																																																											
tower type										TT										TT																																																																					
										project:		110 kV OHTL V5522																																																																													
										conductor:		1 x 3 x 243-AL1/39-ST1A (Ø21,8)																																																																													
span length [m]										178,7										157,0										152,2										142,7										146,0										157,6																													
EDS(10°C) [N/mm²]										23,70										23,70										23,70										23,70										23,70										23,70																													
										-										-										-										-										-										-										0																			
tower No.										26										27										28										29										30										31										32																			
tower type										TT										ST										ST										ST										ST										ST										ST																			
span length [m]										147,0										183,0										180,9										127,2										202,0										166,6																													
EDS(10°C) [N/mm²]										23,70										23,70										23,70										23,70										23,70										23,70										23,70										0									
										-										-										-										-										-										-										0																			
tower No.										32										33										34										35										36										37										38																			
tower type										ST										TT										ST										ST										ST										ST										ST																			
span length [m]										166,4										169,3										144,2										152,0										194,7										181,3																													
EDS(10°C) [N/mm²]										23,70										23,70										23,69										23,69										23,69										23,69										23,69										0									
										-										-										-										-										-										-										0																			
tower No.										38										39										40										41										42										43										44																			
tower type										ST										ST										TT										ST										ST										ST										ST																			
										TT = tension tower										X = damper																																																																					
										ST = suspension tower																																																																															

Warning:

customer: EDWIN, s.r.o.

The installation instruction applies only to the line and dampers indicated above.

2017-272

23.10.2017

Damper distribution chart

span length [m]		185,6		170,3		189,6		173,1		194,4		125,6		
EDS(10°C) [N/mm²]		23,69		23,69		23,73		23,73		23,73		23,73		
tower No.	44	-	45	-	46	-	47	-	48	-	49	-	50	0
tower type	ST		ST		TT		ST		ST		ST		ST	
span length [m]		204,5		124,0		131,4		137,1		140,1		184,3		
EDS(10°C) [N/mm²]		23,73		23,73		23,53		23,53		23,53		23,53		
tower No.	50	-	51	-	52	-	53	-	54	-	55	-	56	0
tower type	ST		ST		TT		ST		ST		ST		ST	
span length [m]		187,5		157,6		173,1		177,7		166,6		172,7		
EDS(10°C) [N/mm²]		23,53		23,53		23,53		23,69		23,69		23,69		
tower No.	56	-	57	-	58	-	59	-	60	-	61	-	62	0
tower type	ST		ST		ST		TT		ST		ST		ST	
span length [m]		209,4		191,7		108,4		179,1		168,2		151,4		
EDS(10°C) [N/mm²]		23,69		23,69		23,69		23,69		23,69		23,69		
tower No.	62	-	63	-	64	-	65	-	66	-	67	-	68	0
tower type	ST		ST		ST		ST		ST		ST		ST	
<div> <div>TT = tension tower</div> <div>× = damper</div> <div>ST = suspension tower</div> </div>														

Warning:

customer: EDWIN, s.r.o.

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2017-272

23.10.2017

Damper distribution chart

span length [m]	158,9	159,9	165,4	173,3	124,6	186,6	
EDS(10°C) [N/mm²]	23,69	14,68	14,68	14,68	14,68	14,68	
tower No.	68	69	70	71	72	73	74
tower type	ST	TT	ST	ST	ST	ST	ST
span length [m]	196,1	179,3	193,9	163,8	185,7	160,1	
EDS(10°C) [N/mm²]	14,68	14,68	9,91	9,91	9,91	9,91	
tower No.	74	75	76	77	78	79	80
tower type	ST	ST	TT	ST	ST	ST	TT
span length [m]	187,8	132,6	180,4	192,5	160,0	194,7	
EDS(10°C) [N/mm²]	9,91	9,91	9,91	9,91	9,91	9,91	
tower No.	80	81	82	83	84	85	86
tower type	TT	ST	ST	ST	ST	TT	ST
span length [m]	171,8	200,3	187,5	167,4	170,4	158,7	
EDS(10°C) [N/mm²]	9,91	9,91	9,91	9,91	9,91	9,91	
tower No.	86	87	88	89	90	91	92
tower type	ST	ST	ST	ST	ST	ST	TT
TT = tension tower × = damper							
ST = suspension tower							

Warning:

customer: EDWIN, s.r.o.

The installation instruction applies only to the line and dampers indicated above.

2017-272

23.10.2017

Damper distribution chart

span length [m]	150,0	161,7	150,5	156,4	158,4	140,3	
EDS(10°C) [N/mm²]	14,62	14,62	14,62	14,62	14,62	14,62	
tower No.	92	93	94	95	96	97	98
tower type	TT	ST	ST	ST	ST	ST	ST
span length [m]	171,7	175,2	159,5	146,0	182,2	165,5	
EDS(10°C) [N/mm²]	14,62	14,62	14,62	14,62	14,64	14,64	
tower No.	98	99	100	101	102	103	104
tower type	ST	ST	ST	ST	TT	ST	ST
span length [m]	141,0	163,0	162,4	168,8	169,3	170,6	
EDS(10°C) [N/mm²]	14,64	14,64	14,64	14,64	14,64	14,64	
tower No.	104	105	106	107	108	109	110
tower type	ST	ST	ST	ST	ST	ST	ST
span length [m]	159,4	122,0	235,5	146,7	188,5	154,7	
EDS(10°C) [N/mm²]	14,64	14,64	24,24	23,57	23,57	23,57	
tower No.	110	111	112	113	114	115	116
tower type	ST	ST	TT	TT	ST	ST	ST
TT = tension tower × = damper							
ST = suspension tower							

Warning:

customer: EDWIN, s.r.o.

The installation instruction applies only to the line and dampers indicated above.

2017-272
23.10.2017

Damper distribution chart

span length [m]	156,1	174,6	166,8	153,8	177,6	156,5	
EDS(10°C) [N/mm²]	23,57	23,57	23,57	23,57	23,57	23,57	
tower No.	116	117	118	119	120	121	122
tower type	ST	ST	ST	ST	ST	ST	TT
span length [m]	179,9	158,6	135,3	119,8	187,6	142,4	
EDS(10°C) [N/mm²]	23,34	23,34	23,34	23,34	23,34	23,34	
tower No.	122	123	124	125	126	127	128
tower type	TT	ST	ST	ST	ST	ST	ST
span length [m]	136,5	102,7	140,0	184,4	139,3	167,0	
EDS(10°C) [N/mm²]	23,34	23,34	23,34	14,72	14,64	14,64	
tower No.	128	129	130	131	132	133	134
tower type	ST	ST	ST	TT	TT	ST	ST
span length [m]	165,1	180,0	184,6	151,2	133,2	143,2	
EDS(10°C) [N/mm²]	14,64	14,64	14,64	14,64	14,64	14,64	
tower No.	134	135	136	137	138	139	140
tower type	ST	ST	ST	ST	ST	ST	ST
TT = tension tower × = damper							
ST = suspension tower							

Warning:

customer: EDWIN, s.r.o.

The installation instruction applies only to the line and dampers indicated above.

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23.10.2017

Damper distribution chart

span length [m]		168,5		159,9		109,5		109,3		128,7		182,2		
EDS(10°C) [N/mm²]		14,64		14,63		14,60		14,60		14,60		14,60		
tower No.	140	-	141	-	142	-	143	-	144	-	145	-	146	0
tower type	ST		TT		TT		ST		ST		ST		ST	
span length [m]		157,1		168,2		162,2		169,0		177,8		185,4		
EDS(10°C) [N/mm²]		14,60		14,60		14,60		14,67		14,67		14,67		
tower No.	146	-	147	-	148	-	149	-	150	-	151	-	152	0
tower type	ST		ST		ST		TT		ST		ST		ST	
span length [m]		143,6		164,2		158,8		135,5		161,6		159,8		
EDS(10°C) [N/mm²]		14,67		14,67		14,67		14,61		14,61		14,61		
tower No.	152	-	153	-	154	-	155	-	156	-	157	-	158	0
tower type	ST		ST		ST		TT		ST		ST		ST	
span length [m]		139,2		168,2		189,3		144,0		163,1		153,5		
EDS(10°C) [N/mm²]		14,61		14,61		23,52		23,52		23,52		23,52		
tower No.	158	-	159	-	160	-	161	-	162	-	163	-	164	0
tower type	ST		ST		TT		ST		ST		ST		ST	
<div>TT = tension tower</div> <div>ST = suspension tower</div> <div>✕ = damper</div>														

Warning:

customer: EDWIN, s.r.o.

The installation instruction applies only to the line and dampers indicated above.

2017-272

23.10.2017

span length [m]	150,2	258,6	309,0	310,5	316,3	291,8	
EDS(10°C) [N/mm²]	23,52	42,73	42,73	42,73	42,73	42,73	
tower No.	164	165	166	167	168	169	170
tower type	ST	TT	ST	ST	ST	ST	ST
span length [m]	301,8	332,3	318,7	333,5	327,1	150,6	
EDS(10°C) [N/mm²]	42,73	42,73	42,73	42,73	42,73	38,54	
tower No.	170	171	172	173	174	175	176
tower type	ST	ST	ST	ST	ST	TT	TT
span length [m]	152,3	158,8	165,8	184,0	171,6	189,5	
EDS(10°C) [N/mm²]	38,63	23,75	23,75	23,75	23,75	23,75	
tower No.	176	177	178	179	180	181	182
tower type	TT	TT	ST	ST	ST	ST	ST
span length [m]	194,9	132,3	197,8	187,5	206,5	154,7	
EDS(10°C) [N/mm²]	23,75	23,74	23,74	23,74	23,74	23,74	
tower No.	182	183	184	185	186	187	188
tower type	ST	TT	ST	ST	ST	ST	ST
TT = tension tower × = damper ST = suspension tower							

Warning:

customer: EDWIN, s.r.o.

The installation instruction applies only to the line and dampers indicated above.

2017-272

23.10.2017

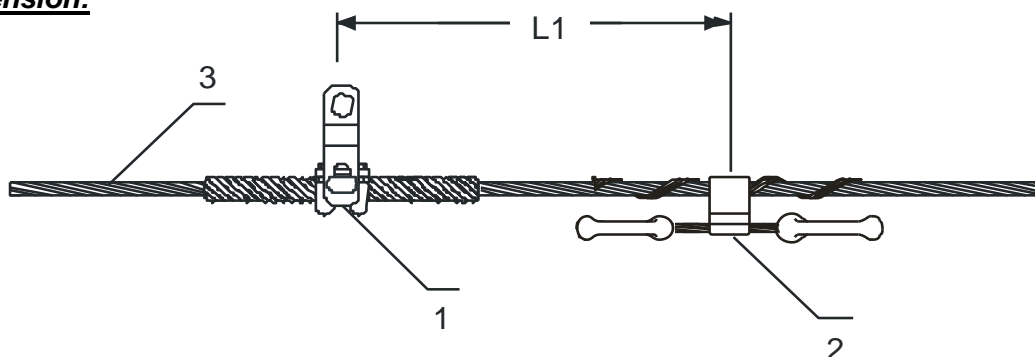
- 7 -

23.10.2017

customer: EDWIN, s.r.o.
project: 110 kV OHTL V5522

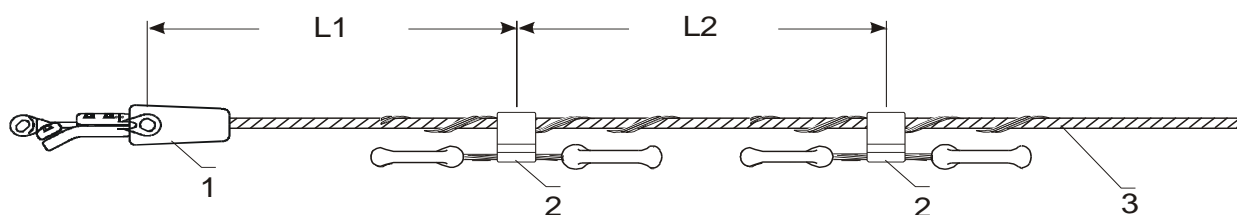
conductor: 185-AL1/30-ST1A (Ø19,0) 243-AL1/39-ST1A (Ø21,8) EDS (10°C): max. 43,1 N/mm²

Suspension:



1 - suspension clamp:	104203KB	104206KB	L1 = 0,8 m
2 - damper:	B161001A01	B161002A02	
3 - conductor:	184-AL1/30-ST1A	243-AL1/39-ST1A	

Tension:



1 - tension clamp:	B118203A01	B118223A01	L1 = 0,7 m
2 - damper:	B161001A01	B161002A02	L2 = 0,8 m
3 - conductor:	184-AL1/30-ST1A	243-AL1/39-ST1A	

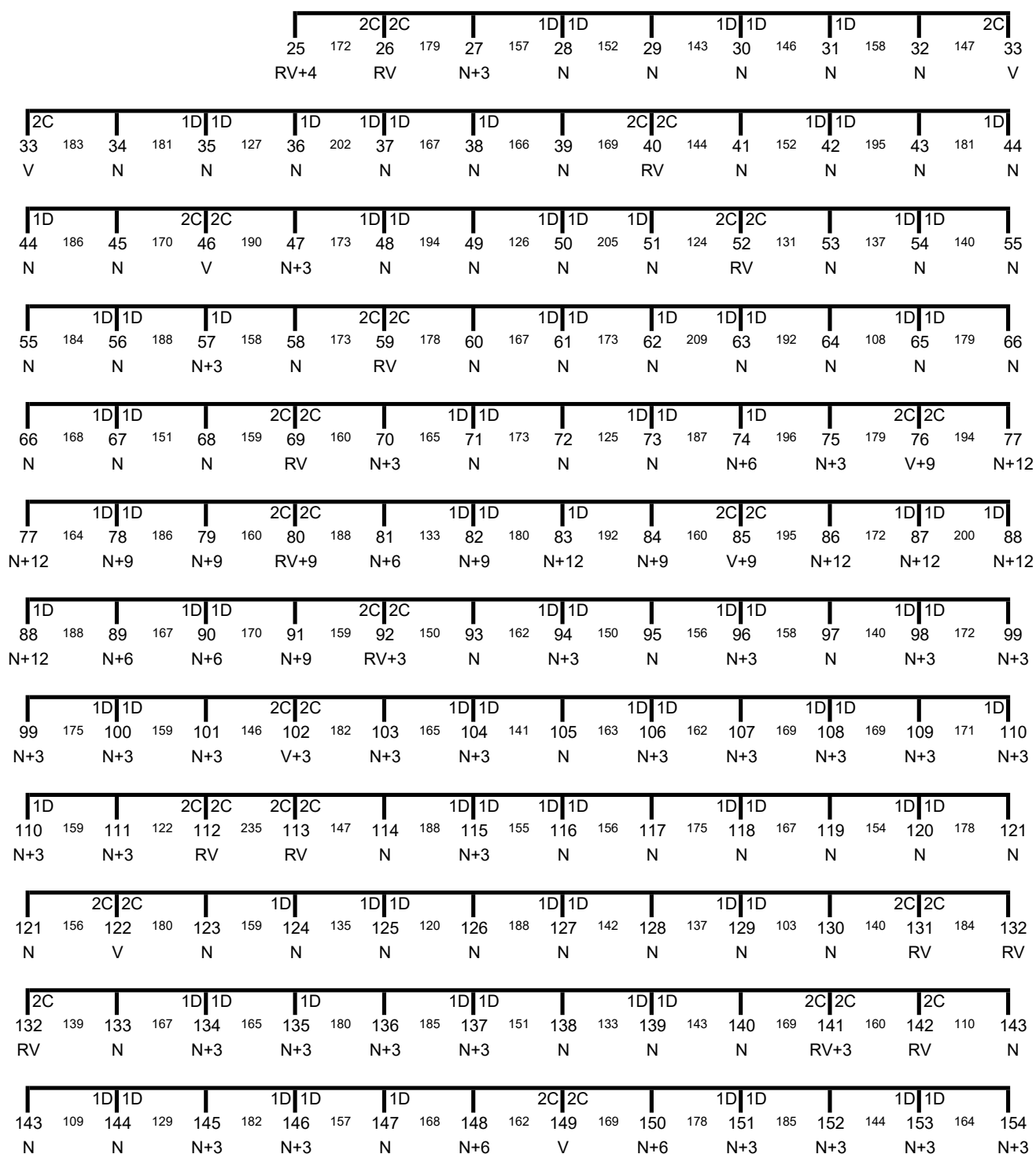
The damper locations are only valid for the damper type numbers shown in the drawing. They are not transferable to other damper types. Ignoring this warning may cause damage of conductor or damper.

C - tlumič vibrací B853002A01

116 ks na KZL (kotevní)

D - tlumič vibrací B853002A06

153 ks na KZL (nosný)





110 kV-transmission line "V5522" (Edwin/ Slovakia)

2S 2/24 (M112 / R62-101) – 14,45mmØ



Tower no.	25	26	27	28	29	30	31	32	33	34	35	36	8 x B853002A01
Tower type	T	T	S	S	S	S	S	S	T	S	S	S	7 x B853002A06
Span length [m]	172,5	178,7	157,0	152,2	142,7	146,0	157,6	147,0	183,0	180,9	127,2		
Every Day Stress [MPa]	53,51	29,08	29,08	29,08	29,08	29,08	29,08	29,08	29,42	29,42	29,42		



Tower no.	36	37	38	39	40	41	42	43	44	45	46	47	8 x B853002A01
Tower type	S	S	S	S	T	S	S	S	S	S	T	S	8 x B853002A06
Span length [m]	202,0	166,6	166,4	169,3	144,2	152,0	194,7	181,3	185,6	170,3	189,6		
Every Day Stress [MPa]	29,42	29,42	29,42	29,42	29,41	29,41	29,41	29,41	29,41	29,41	29,46		

Tower no.	47	48	49	50	51	52	53	54	55	56	57	58	4 x B853002A01
Tower type	S	S	S	S	S	T	S	S	S	S	S	S	10 x B853002A06
Span length [m]	173,0	194,4	125,6	204,5	124,0	131,4	137,1	140,1	184,3	187,5	157,6		
Every Day Stress [MPa]	29,46	29,46	29,46	29,46	29,46	29,22	29,22	29,22	29,22	29,22	29,22		

Tower no.	58	59	60	61	62	63	64	65	66	67	68	69	6 x B853002A01
Tower type	S	T	S	S	S	S	S	S	S	S	S	T	9 x B853002A06
Span length [m]	173,1	177,7	166,6	172,7	209,4	191,7	108,4	179,1	168,2	151,4	158,9		
Every Day Stress [MPa]	29,22	29,41	29,41	29,41	29,41	29,41	29,41	29,41	29,41	29,41	29,41		

Tower no.	69	70	71	72	73	74	75	76	77	78	79	80	8 x B853002A01
Tower type	T	S	S	S	S	S	S	T	S	S	S	T	7 x B853002A06
Span length [m]	159,9	165,4	173,3	124,6	186,6	196,1	179,3	193,9	163,8	185,7	160,1		
Every Day Stress [MPa]	18,59	18,59	18,59	18,59	18,59	18,59	18,59	12,87	12,87	12,87	12,87		

 Damper B853002A01: 34 pieces
 Damper B853002A06: 41 pieces

 Tension tower
 Suspension tower

RIBE
 Electrical Fittings
 2019_195
 19.07.2019

110 kV-transmission line "V5522" (Edwin/ Slovakia)

2S 2/24 (M112 / R62-101) – 14,45mmØ



Tower no.	80	81	82	83	84	85	86	87	88	89	90	91	6 x B853002A01
Tower type	T	S	S	S	S	T	S	S	S	S	S	S	9 x B853002A06
Span length [m]	187,8	132,6	180,4	192,5	160,0	194,7	171,8	200,3	187,5	167,4	170,4		
Every Day Stress [MPa]	12,87	12,87	12,87	12,87	12,87	12,88	12,88	12,88	12,88	12,88	12,88	12,88	



Tower no.	91	92	93	94	95	96	97	98	99	100	101	102	6 x B853002A01
Tower type	S	T	S	S	S	S	S	S	S	S	S	T	8 x B853002A06
Span length [m]	158,7	150,0	161,7	150,5	156,4	158,4	140,3	171,7	175,2	159,5	146,0		
Every Day Stress [MPa]	12,88	18,83	18,83	18,83	18,83	18,83	18,83	18,83	18,83	18,83	18,83	18,83	

Tower no.	102	103	104	105	106	107	108	109	110	111	112	113	8 x B853002A01
Tower type	T	S	S	S	S	S	S	S	S	S	T	T	8 x B853002A06
Span length [m]	182,3	165,5	141,0	163,0	162,4	168,9	169,3	170,6	159,4	122,0	235,5		
Every Day Stress [MPa]	18,54	18,54	18,54	18,54	18,54	18,54	18,54	18,54	18,54	18,54	33,71		

Tower no.	113	114	115	116	117	118	119	120	121	122	123	124	6 x B853002A01
Tower type	T	S	S	S	S	S	S	S	S	T	S	S	9 x B853002A06
Span length [m]	146,7	188,5	1.564,7	156,1	174,6	166,8	153,8	177,6	156,5	179,9	158,6		
Every Day Stress [MPa]	29,27	29,27	29,27	29,27	29,27	29,27	29,27	29,27	29,27	29,98	29,98		

Tower no.	124	125	126	127	128	129	130	131	132	133	134	135	6 x B853002A01
Tower type	S	S	S	S	S	S	S	T	T	S	S	S	8 x B853002A06
Span length [m]	135,3	119,8	187,6	142,4	136,5	102,7	140,0	184,4	139,3	167,0	165,1		
Every Day Stress [MPa]	29,98	29,98	29,98	29,98	29,98	29,98	29,98	18,64	18,54	18,54	18,54		

 Damper B853002A01: 32 pieces
 Damper B853002A06: 42 pieces

 Tension tower
 Suspension tower

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 Electrical Fittings
 2019_195
 19.07.2019

110 kV-transmission line "V5522" (Edwin/ Slovakia)

2S 2/24 (M112 / R62-101) – 14,45mmØ

Tower no.	135	136	137	138	139	140	141	142	143	144	145	146	6 x B853002A01
Tower type	S	S	S	S	S	S	T	T	S	S	S	S	8 x B853002A06
Span length [m]	180,0	184,6	151,2	133,2	143,2	168,5	159,9	109,5	109,3	128,7	182,2		
Every Day Stress [MPa]	18,54	18,54	18,54	18,54	18,54	18,54	18,84	18,48	18,48	18,48	18,48		

Tower no.	146	147	148	149	150	151	152	153	154	155	156	157	8 x B853002A01
Tower type	S	S	S	T	S	S	S	S	S	T	S	S	7 x B853002A06
Span length [m]	157,1	168,2	162,2	169,0	177,8	185,4	143,6	164,2	158,8	135,5	161,6		
Every Day Stress [MPa]	18,48	18,48	18,48	18,57	18,57	18,57	18,57	18,57	18,57	18,49	18,49		

Tower no.	157	158	159	160	161	162	163	164	165	166	167	168	8 x B853002A01
Tower type	S	S	S	T	S	S	S	S	T	S	S	S	10 x B853002A06
Span length [m]	159,8	139,2	168,2	189,3	144,0	163,1	155,5	150,2	258,6	309,0	310,5		
Every Day Stress [MPa]	18,49	18,49	18,49	29,21	29,21	29,21	29,21	29,21	53,22	53,22	53,22		

Tower no.	168	169	170	171	172	173	174	175	176	177	178	179	8 x B853002A01
Tower type	S	S	S	S	S	S	S	T	T	T	S	S	14 x B853002A06
Span length [m]	316,3	291,8	301,8	332,3	318,7	333,5	327,1	150,6	152,3	158,8	165,8		
Every Day Stress [MPa]	53,22	53,22	53,22	53,22	53,22	53,22	53,22	48,12	48,22	29,48	29,48		

Tower no.	179	180	181	182	183	184	185	186	187	188	189	190	6 x B853002A01
Tower type	S	S	S	S	T	S	S	S	S	S	S	T	9 x B853002A06
Span length [m]	184,0	171,6	189,5	194,9	132,3	197,8	187,5	206,5	154,7	156,5	177,8		
Every Day Stress [MPa]	29,48	29,48	29,48	29,48	29,48	29,48	29,48	29,48	29,48	29,48	29,48		



















└ Damper B853002A01: 36 pieces
└ Damper B853002A06: 48 pieces



















T Tension tower
S Suspension tower



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
110 kV-transmission line "V5522" (Edwin/ Slovakia)



2S 2/24 (M112 / R62-101) – 14,45mmØ

																				
Tower no.	190	191	192	193	194	195	196	197	198	199	200	201	8 x B853002A01							
Tower type	T	S	S	S	S	S	S	S	S	T	T	S	15 x B853002A06							
Span length [m]	276,2	311,0	310,1	375,6	299,0	350,8	190,3	254,4	188,0	168,6	335,4									
Every Day Stress [MPa]	58,98	58,98	58,98	58,98	58,98	58,98	58,98	58,98	58,98	58,98	54,94	59,36								

																			
Tower no.	201	202	203	204	205	206	Port.	6 x B853002A01											
Tower type	S	S	S	S	T	T	T	7 x B853002A06											
Span length [m]	324,3	364,4	389,5	205,5	127,4	21,3													
Every Day Stress [MPa]	59,36	59,36	59,36	59,36	47,17	7,96													

 Damper B853002A01: 14 pieces
 Damper B853002A06: 22 pieces

 Tension tower
 Suspension tower

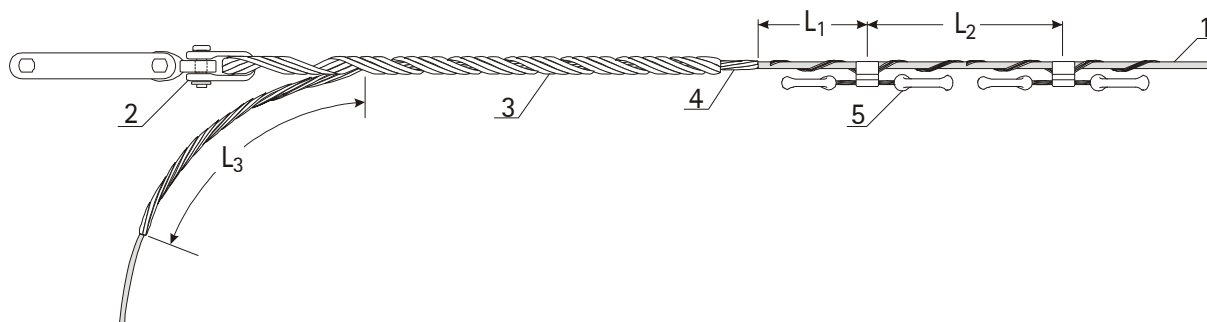
Total:
 Damper B853002A02: 116 pieces
 Damper B853002A06: 153 pieces

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 Electrical Fittings
 2019_195
 19.07.2019

OPGW : **2S 2/24 (M112 / R62-101) – 14,45mmØ**
 Customer : **EDWIN s.r.o.**
 Project : **Line V5522**
 Conductor self damping : **Estimated on basis of similar OPGW's**
 Every Day Stress (EDS) : **≤ 54 MPa (for 10 °C)**

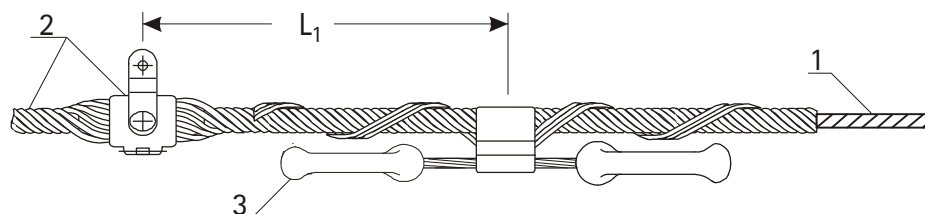
Study:
2019_195
 Date:
19.07.2019

Tension tower:



1.....	OPGW/ ADSS.....	
2.....	Thimble.....	F02686A02
3.....	Dead end.....	AW225153s
4.....	Protection rods.....	RW148200lis
5.....	Vibration damper.....	B853002A01
	with helical rods.....	TW148040
		$L_1 \approx 0,5 \text{ m}$
		$L_2 = 0,6 \text{ m}$
		$L_3 \approx 0,4 \text{ m}$

Suspension tower:


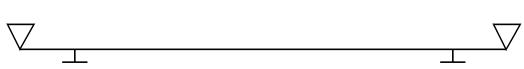
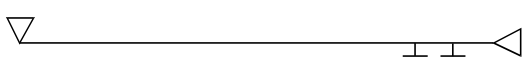
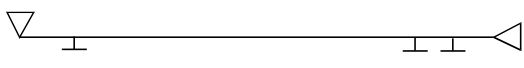
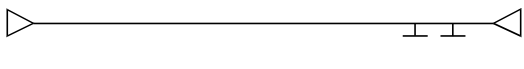
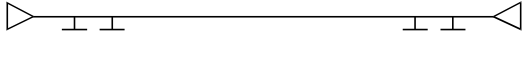





1.....	OPGW/ ADSS.....	
2.....	Amour grip suspension.	LTA144180/6lis
3.....	Vibration damper.....	B853002A06
	with helical rods.....	TW252062
		$L_1 = 0,6 \text{ m}$

The damper locations are only valid for the damper type numbers shown in the drawing. They are not transferrable to other damper types. Ignoring this warning may cause damage of the cable or the damper.

OPGW : **2S 2/24 (M112 / R62-101) – 14,45mmØ**
 Customer : **EDWIN s.r.o.**
 Project : **Line V5522**
 Conductor self damping : **Estimated on basis of similar OPGW's**
 Every Day Stress (EDS) : **≤ 54 MPa (for 10 °C)**

Study:
2019_195
 Date:
19.07.2019

		max. span length	Damper left	Damper right
	S - S	< 200 m	type 1	-----
	S - S	200 – 400 m	type 1	type 1
	S - T	< 200 m	-----	type 2
	S - T	200 – 400 m	type 1	type 2
	T - T	< 200 m	-----	type 2
	T - T	200 – 400 m	type 2	type 2

Symbols:  suspension (S)  tension (T)  vibration damper

type 1: B853002A06

type 2: B853002A01

The damper locations are only valid for the damper type numbers shown in the drawing. They are not transferrable to other damper types. Ignoring this warning may cause damage of the cable or the damper.