

Current rating medium voltage cables with impregnated paper insulation – single core

acc. to HD 621 S1, part 3C

General

This section applies to single-core cables with impregnated paper insulation – also for pre-stranded cables.

General conditions

Temperatures °C (conductor)	6/10 kV	12/20 kV	18/30 kV
highest permissible operating temperature	+70	+65	+60
highest short circuit temperature (max. 5 s)	+170 *)	+170 *)	+150

*) 160°C for soldered conductor connections.

Metal sheath and concentric conductors are grounded on both ends.

Operating frequency 50 Hz.

The tabulated loading capacities are based on various conditions such as

- operating mode,
- laying conditions,
- environmental conditions.

In the event of deviating operating conditions, the loading capacities are to be multiplied by suitable conversion factors, which are based on the same calculation principles and operating conditions as the given values.

Current carrying capacity of paper insulated medium voltage cables (6/10 kV)

Laying in earth (20°C)

Recommended values according to HD 621 S1, part 3C, table 6

U ₀ / U	6/10 kV							
	NKY		NKLEY		NAKY		NAKLEY	
Arrange- ment								
Cross- section mm ²	Copper conductor rated current in A				Aluminium conductor rated current in A			
25	140	160	139	158	108	124	108	124
35	167	191	166	188	129	148	129	147
50	197	226	196	220	153	175	153	173
70	241	275	240	264	188	214	187	209
95	289	328	286	310	224	256	223	247
120	329	371	324	345	256	291	254	278
150	369	414	361	377	287	325	283	306
185	417	465	405	414	325	366	320	340
240	483	534	465	461	378	423	369	383
300	544	595	515	495	427	474	413	418
400	617	668	574	535	489	537	467	461
500	695	741	631	569	558	606	524	500
630	-	-	-	-	-	-	-	-
800	-	-	-	-	-	-	-	-
1000	-	-	-	-	-	-	-	-

Current carrying capacity of paper insulated medium voltage cables (6/10 kV)

Laying in air (30°C)

Recommended values according to HD 621 S1, part 3C, table 7

U ₀ / U	6/10 kV							
	NKY		NKLEY		NAKY		NAKLEY	
Arrange- ment								
Cross- section mm ²	Copper conductor rated current in A				Aluminium conductor rated current in A			
25	124	145	124	144	96	112	96	112
35	151	176	150	175	117	137	117	136
50	181	213	181	210	141	165	141	164
70	228	267	226	261	177	208	176	205
95	279	327	276	315	216	254	215	248
120	322	378	318	360	251	295	249	286
150	368	431	361	402	286	336	283	322
185	423	494	413	452	330	387	325	366
240	501	584	484	517	392	459	384	425
300	577	666	549	566	453	527	438	473
400	668	767	626	626	529	614	507	534
500	770	874	705	679	619	711	583	592
630	-	-	-	-	-	-	-	-
800	-	-	-	-	-	-	-	-
1000	-	-	-	-	-	-	-	-

Current carrying capacity of paper insulated medium voltage cables (12/20 kV)

Laying in earth (20°C)

Recommended values according to HD 621 S1, part 3C, table 8

U ₀ / U	12/20 kV							
	NKY		NKLEY		NAKY		NAKLEY	
Arrange- ment								
Cross- section mm ²	Copper conductor rated current in A				Aluminium conductor rated current in A			
25	137	150	137	148	106	117	106	116
35	164	182	163	178	127	141	127	139
50	194	216	193	211	150	168	150	166
70	237	266	234	254	184	207	183	202
95	284	317	280	298	220	247	219	238
120	323	359	317	332	251	281	248	268
150	362	400	353	362	282	314	277	294
185	409	450	396	398	319	355	313	327
240	474	516	452	443	371	409	361	369
300	534	575	501	476	419	458	403	403
400	605	644	557	516	480	520	455	445
500	682	714	610	550	548	585	508	484
630	-	-	-	-	-	-	-	-
800	-	-	-	-	-	-	-	-
1000	-	-	-	-	-	-	-	-

Current carrying capacity of paper insulated medium voltage cables (12/20 kV)

Laying in air (30°C)

Recommended values according to HD 621 S1, part 3C, table 9

U ₀ / U	12/20 kV							
	NKY		NKLEY		NAKY		NAKLEY	
Arrange- ment								
Cross- section mm ²	Copper conductor rated current in A				Aluminium conductor rated current in A			
25	118	134	118	133	92	104	92	104
35	143	163	143	161	111	126	111	125
50	172	196	171	193	133	152	133	151
70	215	245	213	238	167	191	166	188
95	262	299	260	287	204	233	202	227
120	303	346	299	327	236	270	234	261
150	345	393	338	365	268	307	265	293
185	396	450	385	409	309	353	304	332
240	468	529	450	467	366	417	357	384
300	537	604	509	513	421	479	407	429
400	621	692	579	568	492	556	470	484
500	715	787	649	617	573	642	537	537
630	-	-	-	-	-	-	-	-
800	-	-	-	-	-	-	-	-
1000	-	-	-	-	-	-	-	-

Current carrying capacity of paper insulated medium voltage cables (18/30 kV)

Laying in earth (20°C)

Recommended values according to HD 621 S1, part 3C, table 10

U ₀ / U	18/30 kV							
	NKY		NKLEY		NAKY		NAKLEY	
Arrange- ment								
Cross- section mm ²	Copper conductor rated current in A				Aluminium conductor rated current in A			
25	–	–	–	–	–	–	–	–
35	156	168	155	165	121	130	120	129
50	185	200	184	195	144	155	143	153
70	229	247	227	238	178	192	177	188
95	276	297	272	281	215	232	212	224
120	316	339	309	317	246	266	243	254
150	354	382	345	351	276	299	271	283
185	400	431	385	384	313	340	305	317
240	463	499	440	427	363	395	351	357
300	522	555	486	461	410	444	392	391
400	591	619	539	499	470	502	442	432
500	666	684	590	535	536	564	494	471
630	–	–	–	–	–	–	–	–
800	–	–	–	–	–	–	–	–
1000	–	–	–	–	–	–	–	–

Current carrying capacity of paper insulated medium voltage cables (18/30 kV)

Laying in air (30°C)

Recommended values according to HD 621 S1, part 3C, table 11

U ₀ / U	18/30 kV							
	NKY		NKLEY		NAKY		NAKLEY	
Arrange- ment								
Cross- section mm ²	Copper conductor rated current in A				Aluminium conductor rated current in A			
25	–	–	–	–	–	–	–	–
35	134	149	133	147	104	116	104	115
50	160	179	160	176	124	139	124	138
70	200	224	198	217	155	174	155	171
95	244	273	241	261	189	213	188	207
120	281	315	276	297	219	246	216	237
150	319	357	312	332	248	279	245	266
185	366	408	355	371	286	321	280	301
240	432	480	414	423	338	379	329	348
300	495	546	467	466	388	433	375	390
400	572	623	529	515	453	501	431	439
500	658	706	594	563	527	577	492	490
630	–	–	–	–	–	–	–	–
800	–	–	–	–	–	–	–	–
1000	–	–	–	–	–	–	–	–

Current carrying capacity of paper insulated medium voltage cables

Permissible short-circuit temperatures and rated short-time current densities

Recommended values according to HD 621 S1, part 3C, table 13

Cables with ▼	admissible short-circuit temperature °C	rated short-circuit current densities in A/mm ² for a rated short-circuit duration of 1s						
		conductor temperature at the beginning of short-circuit in °C						
		70	65	60	50	40	30	20
Copper conductor								
6/10 kV & 12/20 kV	170	120	124	127	134	141	147	154
18/30 kV	150	–	–	117	124	131	138	145
Aluminium conductor								
6/10 kV & 12/20 kV	170	80	82	84	89	93	97	102
18/30 kV	150	–	–	77	82	87	91	96