

Moeller series

Cable lengths

in accordance with EN 60204-1 and DIN VDE 0100-410

Maximum Cable Lengths for Eaton's Protective Devices



EATON

Powering Business Worldwide



Cable lengths for the protection of cables and wires.

When faults (such as earth faults or short circuits) occur in the electrical installations of any building, machinery and equipment they pose a danger to people and property. To prevent this, the affected installations have to be switched off as quickly as possible by built-in overcurrent protection devices. International standards specify the minimum switch-off times. **EN 60204-1** (Electrical equipment of machines) calls for a maximum switch-off time of five seconds in the event of a fault. For household installations and manually operated devices, the maximum switch-off time is

only 0.4 seconds, as specified by **DIN VDE 0100-410** ("automatic disconnection of the power supply").

To ensure that circuit breakers, miniature circuit breakers or motor-protective circuit breakers trip within the required switch-off times, a minimum (short-circuit) current must be able to flow. This current is largely determined by the impedance of the installed wires.

Impedance of the wires

S [mm ²]	Z' [Ohm/km]
1,5	14,62
2,5	8,77
4	5,48
6	3,66
10	2,246
16	1,418
25	0,902
35	0,657
50	0,489
70	0,346
95	0,257
120	0,211
150	0,174
185	0,148
240	0,124
300	0,111

Calculation of maximum cable lengths:

$$I_{kmin} = \frac{C * U}{\sqrt{3} * Z}$$

$$Z = Z_v + Z_l \text{ with } Z_l = 2 * Z_l' * L$$

$$L = \frac{C * U}{\sqrt{3} * I_{kmin}} - Z_v$$

$$2 * Z_l'$$

Due to the tolerance of the instantaneous release mechanism (+/-20%) and the conversion of Ω/km into Ω/m, the formula changes as follows:

$$L = \frac{C * U}{\sqrt{3} * 1,2 * I_{ausloer}} - Z_v$$

$$2 * Z_l' * 1000 \text{ in m}$$

Based on DIN VDE 0100-430, with reference to EN 60909
Simplified method according to G. Kiefer, "DIN VDE 0100 and its Practical Applications" (VDE Verlag)

Switch-off time in the event of a short circuit < 0.4 sec



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKZM0(1)

Wire size S [mm ²]	Rated current PKZM...	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	0.16	2.48	2521	2520	2518	2514	2511	2508	2504
1.5	0.25	3.88	1613	1612	1610	1607	1603	1600	1596
1.5	0.4	6.20	1008	1007	1005	1002	998	995	991
1.5	0.63	9.77	640	639	637	633	630	627	623
1.5	1	15.50	403	402	400	397	393	390	386
1.5	1.6	24.80	252	250	249	245	242	238	235
1.5	2.5	38.75	161	160	158	155	151	148	144
1.5	4	62.00	101	99	97	94	91	87	84
1.5	6.3	97.65	64	62	61	57	54	50	47
1.5	10	155.00	40	39	37	33	30	27	23
1.5	12	186.00	33	32	30	27	23	20	17
1.5	16	248.00	25	24	22	18	15	12	8
1.5	20	310.00	20	18	17	13	10	6	3
2.5	0.16	2.48	4202	4200	4197	4192	4186	4180	4175
2.5	0.25	3.88	2689	2687	2684	2679	2673	2667	2661
2.5	0.4	6.20	1681	1678	1676	1670	1664	1658	1653
2.5	0.63	9.77	1067	1065	1062	1056	1050	1045	1039
2.5	1	15.50	672	670	667	661	655	650	644
2.5	1.6	24.80	420	417	415	409	403	397	392
2.5	2.5	38.75	268	266	263	258	252	246	240
2.5	4	62.00	168	165	162	157	151	145	140
2.5	6.3	97.65	106	104	101	95	90	84	78
2.5	10	155.00	67	64	62	56	50	44	39
2.5	12	186.00	55	53	50	45	39	33	28
2.5	16	248.00	41	39	36	31	25	19	14
2.5	20	310.00	33	31	28	22	17	11	5
2.5	25	387.50	26	24	21	15	10	4	-
2.5	32	496.00	20	18	15	10	4	-	-
4	0.16	2.48	6725	6722	6717	6708	6699	6690	6681
4	0.25	3.88	4304	4300	4296	4287	4277	4268	4259
4	0.4	6.20	2690	2686	2681	2672	2663	2654	2645
4	0.63	9.77	1707	1704	1699	1690	1681	1672	1663
4	1	15.50	1075	1072	1067	1058	1049	1040	1031
4	1.6	24.80	672	668	664	654	645	636	627
4	2.5	38.75	430	426	421	412	403	394	385
4	4	62.00	268	264	260	251	242	233	223
4	6.3	97.65	170	166	162	153	143	134	125
4	10	155.00	107	103	98	89	80	71	62
4	12	186.00	89	85	81	71	62	53	44
4	16	248.00	66	63	58	49	40	31	22
4	20	310.00	53	49	45	36	26	17	8
4	25	387.50	42	38	34	25	16	7	-
4	32	496.00	33	29	25	15	6	-	-
6	0.16	2.48	10070	10064	10057	10044	10030	10017	10003
6	0.25	3.88	6444	6439	6432	6418	6405	6391	6377
6	0.4	6.20	4027	4022	4015	4001	3987	3974	3960
6	0.63	9.77	2556	2551	2544	2530	2517	2503	2489
6	1	15.50	1610	1605	1598	1584	1570	1557	1543
6	1.6	24.80	1006	1000	993	980	966	952	939
6	2.5	38.75	643	638	631	617	604	590	576
6	4	62.00	401	396	389	376	362	348	335
6	6.3	97.65	254	249	242	228	215	201	187
6	10	155.00	160	154	147	134	120	106	93
6	12	186.00	133	127	121	107	93	80	66
6	16	248.00	99	94	87	73	60	46	32
6	20	310.00	79	74	67	53	40	26	12
6	25	387.50	63	58	51	37	23	10	-
6	32	496.00	49	44	37	23	9	-	-



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKZM0-T

Wire size S [mm ²]	Rated current PKZM...	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	0.16	2.40	2605	2604	2602	2598	2595	2592	2588
1.5	0.25	4.25	1471	1470	1468	1464	1461	1458	1454
1.5	0.4	6.80	919	918	916	913	909	906	902
1.5	0.63	12.00	521	519	518	514	511	507	504
1.5	1	20.00	312	311	309	306	302	299	296
1.5	1.6	32.00	195	194	192	189	185	182	178
1.5	2.5	50.00	125	123	122	118	115	111	108
1.5	4	84.00	74	73	71	68	64	61	57
1.5	6.3	141.00	44	43	41	38	34	31	27
1.5	10	224.00	28	26	24	21	18	14	11
1.5	12	224.00	28	26	24	21	18	14	11
1.5	16	280.00	22	21	19	15	12	9	5
1.5	20	350.00	18	16	14	11	8	4	1
2.5	0.16	2.40	4343	4340	4337	4332	4326	4320	4315
2.5	0.25	4.25	2452	2450	2447	2441	2435	2430	2424
2.5	0.4	6.80	1532	1530	1527	1521	1516	1510	1504
2.5	0.63	12.00	868	866	863	857	852	846	840
2.5	1	20.00	521	518	515	510	504	498	493
2.5	1.6	32.00	325	323	320	314	309	303	297
2.5	2.5	50.00	208	206	203	197	191	186	180
2.5	4	84.00	124	121	118	113	107	101	96
2.5	6.3	141.00	73	71	68	63	57	51	45
2.5	10	224.00	46	44	41	35	29	24	18
2.5	12	224.00	46	44	41	35	29	24	18
2.5	16	280.00	37	34	32	26	20	14	9
2.5	20	350.00	29	27	24	18	13	7	1
2.5	25	437.00	23	21	18	12	7	1	-
4	0.16	2.40	6950	6946	6941	6932	6923	6914	6905
4	0.25	4.25	3924	3920	3916	3907	3898	3889	3879
4	0.4	6.80	2452	2449	2444	2435	2426	2417	2408
4	0.63	12.00	1389	1386	1381	1372	1363	1354	1344
4	1	20.00	833	830	825	816	807	798	788
4	1.6	32.00	520	517	512	503	494	485	476
4	2.5	50.00	333	329	325	315	306	297	288
4	4	84.00	198	194	189	180	171	162	153
4	6.3	141.00	117	114	109	100	91	82	73
4	10	224.00	74	70	65	56	47	38	29
4	12	224.00	74	70	65	56	47	38	29
4	16	280.00	59	55	50	41	32	23	14
4	20	350.00	47	43	39	29	20	11	2
4	25	437.00	37	34	29	20	11	2	-
6	0.16	2.40	10405	10400	10393	10380	10366	10352	10339
6	0.25	4.25	5875	5870	5863	5849	5836	5822	5809
6	0.4	6.80	3672	3666	3659	3646	3632	3618	3605
6	0.63	12.00	2080	2075	2068	2054	2040	2027	2013
6	1	20.00	1247	1242	1235	1221	1208	1194	1181
6	1.6	32.00	779	774	767	753	740	726	712
6	2.5	50.00	498	493	486	472	459	445	431
6	4	84.00	296	291	284	270	256	243	229
6	6.3	141.00	176	170	163	150	136	122	109
6	10	224.00	110	105	98	84	71	57	43
6	12	224.00	110	105	98	84	71	57	43
6	16	280.00	88	82	76	62	48	35	21
6	20	350.00	70	65	58	44	30	17	3
6	25	437.00	56	50	43	30	16	3	-

Switch-off time in the event of a short circuit 5 sec



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKZM0(1)

Wire size S [mm ²]	Rated current PKZM...	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
4	0.16	1.28	13031	13028	13023	13014	13005	12996	12987
4	0.25	2.00	8340	8336	8332	8322	8313	8304	8295
4	0.4	3.20	5212	5208	5204	5195	5186	5176	5167
4	0.63	5.04	3309	3305	3301	3292	3282	3273	3264
4	1	8.00	2084	2081	2076	2067	2058	2049	2040
4	1.6	12.80	1302	1299	1294	1285	1276	1267	1258
4	2.5	20.00	833	830	825	816	807	798	788
4	4	32.00	520	517	512	503	494	485	476
4	6.3	50.40	330	326	322	313	304	294	285
4	10	80.00	208	204	199	190	181	172	163
4	12	96.00	173	169	165	156	146	137	128
4	16	128.00	129	126	121	112	103	94	85
4	20	160.00	103	100	95	86	77	68	59
4	25	200.00	82	79	74	65	56	47	38
4	32	256.00	64	61	56	47	38	29	20
6	0.16	1.28	19511	19506	19499	19486	19472	19458	19445
6	0.25	2.00	12487	12481	12475	12461	12447	12434	12420
6	0.4	3.20	7804	7798	7791	7778	7764	7750	7737
6	0.63	5.04	4954	4949	4942	4928	4915	4901	4887
6	1	8.00	3121	3115	3108	3095	3081	3067	3054
6	1.6	12.80	1950	1944	1938	1924	1910	1897	1883
6	2.5	20.00	1247	1242	1235	1221	1208	1194	1181
6	4	32.00	779	774	767	753	740	726	712
6	6.3	50.40	494	489	482	468	455	441	427
6	10	80.00	311	305	299	285	271	258	244
6	12	96.00	259	253	247	233	219	206	192
6	16	128.00	194	188	181	168	154	140	127
6	20	160.00	155	149	142	129	115	101	88
6	25	200.00	124	118	111	98	84	70	57
6	32	256.00	96	91	84	70	57	43	29

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKZM0-T



Wire size S [mm ²]	Rated current PKZM...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
4	0.16	1.28	13031	13028	13023	13014	13005	12996	12987
4	0.25	2.00	8340	8336	8332	8322	8313	8304	8295
4	0.4	3.20	5212	5208	5204	5195	5186	5176	5167
4	0.63	5.04	3309	3305	3301	3292	3282	3273	3264
4	1	8.00	2084	2081	2076	2067	2058	2049	2040
4	1.6	12.80	1302	1299	1294	1285	1276	1267	1258
4	2.5	20.00	833	830	825	816	807	798	788
4	4	32.00	520	517	512	503	494	485	476
4	6.3	50.40	330	326	322	313	304	294	285
4	10	80.00	208	204	199	190	181	172	163
4	12	96.00	173	169	165	156	146	137	128
4	16	128.00	129	126	121	112	103	94	85
4	20	160.00	103	100	95	86	77	68	59
4	25	200.00	82	79	74	65	56	47	38
6	0.16	1.28	19511	19506	19499	19486	19472	19458	19445
6	0.25	2.00	12487	12481	12475	12461	12447	12434	12420
6	0.4	3.20	7804	7798	7791	7778	7764	7750	7737
6	0.63	5.04	4954	4949	4942	4928	4915	4901	4887
6	1	8.00	3121	3115	3108	3095	3081	3067	3054
6	1.6	12.80	1950	1944	1938	1924	1910	1897	1883
6	2.5	20.00	1247	1242	1235	1221	1208	1194	1181
6	4	32.00	779	774	767	753	740	726	712
6	6.3	50.40	494	489	482	468	455	441	427
6	10	80.00	311	305	299	285	271	258	244
6	12	96.00	259	253	247	233	219	206	192
6	16	128.00	194	188	181	168	154	140	127
6	20	160.00	155	149	142	129	115	101	88
6	25	200.00	124	118	111	98	84	70	57

Switch-off time in the event of a short circuit < 0.4 sec



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKZM4

Wire size S [mm ²]	Rated current PKZM...	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
2.5	16	248.00	41	39	36	31	25	19	14
4	16	248.00	66	63	58	49	40	31	22
4	25	387.50	42	38	34	25	16	7	-
4	32	496.00	33	29	25	15	6	-	-
4	40	620.00	26	22	18	9	-	-	-
4	50	775.00	21	17	12	3	-	-	-
4	58	899.00	18	14	9	-	-	-	-
4	63	976.50	16	13	8	-	-	-	-
6	16	248.00	99	94	87	73	60	46	32
6	25	387.50	63	58	51	37	23	10	-
6	32	496.00	49	44	37	23	9	-	-
6	40	620.00	39	33	27	13	-	-	-
6	50	775.00	31	25	19	5	-	-	-
6	58	899.00	26	21	14	-	-	-	-
6	63	976.50	24	19	12	-	-	-	-
10	16	248.00	162	153	142	120	97	75	53
10	25	387.50	103	94	83	61	38	16	-
10	32	496.00	80	71	60	38	15	-	-
10	40	620.00	63	55	43	21	-	-	-
10	50	775.00	50	41	30	8	-	-	-
10	58	899.00	43	34	23	1	-	-	-
10	63	976.50	39	31	19	-	-	-	-
16	16	248.00	256	242	225	189	154	119	84
16	25	387.50	163	149	131	96	61	25	-
16	32	496.00	126	112	95	59	24	-	-
16	40	620.00	100	86	69	33	-	-	-
16	50	775.00	80	66	48	13	-	-	-
16	58	899.00	68	54	36	1	-	-	-
16	63	976.50	62	48	31	-	-	-	-

Switch-off time in the event of a short circuit 5 sec

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKZM4



Wire size S [mm ²]	Rated current PKZM...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
2.5	16	128.00	81	79	76	70	64	59	53
4	16	128.00	129	126	121	112	103	94	85
4	25	200.00	82	79	74	65	56	47	38
4	32	256.00	64	61	56	47	38	29	20
4	40	320.00	51	48	43	34	25	16	7
4	50	400.00	41	37	33	23	14	5	-
4	58	464.00	35	31	27	18	9	-	-
4	63	504.00	32	29	24	15	6	-	-
6	16	128.00	194	188	181	168	154	140	127
6	25	200.00	124	118	111	98	84	70	57
6	32	256.00	96	91	84	70	57	43	29
6	40	320.00	77	71	64	51	37	23	10
6	50	400.00	61	56	49	35	21	8	-
6	58	464.00	52	47	40	27	13	-	-
6	63	504.00	48	43	36	22	9	-	-
10	16	128.00	316	307	296	273	251	229	207
10	25	200.00	201	192	181	159	137	114	92
10	32	256.00	157	148	137	114	92	70	48
10	40	320.00	125	116	105	83	60	38	16
10	50	400.00	100	91	79	57	35	13	-
10	58	464.00	85	77	65	43	21	-	-
10	63	504.00	79	70	58	36	14	-	-
16	16	128.00	500	486	468	433	398	363	327
16	25	200.00	319	305	287	252	217	181	146
16	32	256.00	248	234	217	181	146	111	76
16	40	320.00	198	184	166	131	96	60	25
16	50	400.00	158	144	126	91	55	20	-
16	58	464.00	135	121	104	68	33	-	-
16	63	504.00	124	110	93	57	22	-	-

Switch-off time in the event of a short circuit < 0.4 sec



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE12/XTU(A) and PKE32/XTU(A)

Wire size S [mm ²]	Rated current PKE12(32)...	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	1.2	18.60	336	334	333	329	326	322	319
1.5	4	62.00	101	99	97	94	91	87	84
1.5	12	186.00	33	32	30	27	23	20	17
2.5	1.2	18.60	560	558	555	549	543	538	532
2.5	4	62.00	168	165	162	157	151	145	140
2.5	12	186.00	55	53	50	45	39	33	28
2.5	32	496.00	20	18	15	10	4	-	-
4	1.2	18.60	896	892	888	879	869	860	851
4	4	62.00	268	264	260	251	242	233	223
4	12	186.00	89	85	81	71	62	53	44
4	32	496.00	33	29	25	15	6	-	-
6	1.2	18.60	1341	1336	1329	1315	1302	1288	1275
6	4	62.00	401	396	389	376	362	348	335
6	12	186.00	133	127	121	107	93	80	66
6	32	496.00	49	44	37	23	9	-	-



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE65/XTU(W)(A)

Wire size S [mm ²]	Rated current PKE12(32)...	Instantaneous release response value [A]	Maximum cable length [m] if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
4	32	496.00	33	29	25	15	6	-	-
4	65	1,007.50	16	12	7	-	-	-	-
6	32	496.00	49	44	37	23	9	-	-
6	65	1,007.50	23	18	11	-	-	-	-
10	32	496.00	80	71	60	38	15	-	-
10	65	1,007.50	38	29	18	-	-	-	-
16	32	496.00	126	112	95	59	24	-	-
16	65	1,007.50	60	46	29	-	-	-	-
25	32	496.00	199	177	149	93	38	-	-
25	65	1,007.50	95	73	45	-	-	-	-
35	32	496.00	273	242	204	128	52	-	-
35	65	1,007.50	130	100	62	-	-	-	-

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE32/XTUCP(A) and PKE65/XTU(W)CP(A)



Wire size S [mm ²]	Rated current PKZM...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	36	75.00	83	82	80	77	73	70	66
1.5	36	288.00	21	20	18	15	11	8	5
2.5	36	75.00	138	136	133	128	122	116	110
2.5	36	288.00	36	33	30	25	19	13	8
4	36	75.00	222	218	213	204	195	186	177
4	36	288.00	57	53	49	40	31	21	12
4	65	150.00	110	107	102	93	84	75	66
4	65	520.00	31	28	23	14	5	-	-
6	36	75.00	332	326	319	306	292	278	265
6	36	288.00	85	80	73	59	46	32	18
6	65	150.00	165	160	153	139	126	112	98
6	65	520.00	47	41	34	21	7	-	-
10	36	75.00	540	532	520	498	476	454	431
10	36	288.00	139	130	119	97	75	52	30
10	65	150.00	269	260	249	227	205	182	160
10	65	520.00	76	67	56	34	11	-	-
16	36	75.00	856	842	824	789	754	719	683
16	36	288.00	220	206	189	153	118	83	48
16	65	150.00	426	412	395	359	324	289	253
16	65	520.00	120	106	89	53	18	-	-
25	36	75.00	1346	1324	1296	1240	1185	1130	1074
25	36	288.00	346	324	296	241	186	130	75
25	65	150.00	670	648	620	565	509	454	398
25	65	520.00	189	167	139	84	29	-	-
35	36	75.00	1848	1817	1779	1703	1627	1551	1475
35	36	288.00	476	445	407	331	255	179	103
35	65	150.00	920	890	851	775	699	623	547
35	65	520.00	260	230	191	115	39	-	-

Switch-off time in the event of a short circuit 5 sec

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE12/XTU(A) and PKE32/XTU(A); trip class 5



Wire size S [mm ²]	Rated current PKE12(32)...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	1.2	7.20	868	867	865	862	858	855	851
1.5	4	24.00	260	259	257	254	250	247	243
1.5	12	72.00	87	85	83	80	77	73	70
2.5	1.2	7.20	1447	1445	1442	1436	1431	1425	1419
2.5	4	24.00	434	431	429	423	417	412	406
2.5	12	72.00	144	142	139	133	128	122	116
2.5	32	192.00	54	51	49	43	37	31	26
4	1.2	7.20	2316	2312	2308	2299	2289	2280	2271
4	4	24.00	694	690	686	677	668	659	649
4	12	72.00	231	227	223	213	204	195	186
4	32	192.00	86	82	78	69	60	50	41
6	1.2	7.20	3468	3462	3455	3442	3428	3414	3401
6	4	24.00	1039	1034	1027	1013	1000	986	972
6	12	72.00	346	340	333	320	306	292	279
6	32	192.00	129	123	116	103	89	75	62



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE12/XTU(A) and PKE32/XTU(A); trip class 10

Wire size S [mm ²]	Rated current PKE12(32)...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	1.2	9.60	651	650	648	644	641	638	634
1.5	4	32.00	195	194	192	189	185	182	178
1.5	12	96.00	65	63	62	58	55	51	48
2.5	1.2	9.60	1085	1083	1080	1074	1069	1063	1057
2.5	4	32.00	325	323	320	314	309	303	297
2.5	12	96.00	108	106	103	97	91	86	80
2.5	32	256.00	40	38	35	29	24	18	12
4	1.2	9.60	1737	1733	1729	1719	1710	1701	1692
4	4	32.00	520	517	512	503	494	485	476
4	12	96.00	173	169	165	156	146	137	128
4	32	256.00	64	61	56	47	38	29	20
6	1.2	9.60	2600	2595	2588	2574	2561	2547	2533
6	4	32.00	779	774	767	753	740	726	712
6	12	96.00	259	253	247	233	219	206	192
6	32	256.00	96	91	84	70	57	43	29



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE12/XTU(A) and PKE32/XTU(A); trip class 15

Wire size S [mm ²]	Rated current PKE12(32)...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	1.2	12.00	521	519	518	514	511	507	504
1.5	4	40.00	156	155	153	149	146	143	139
1.5	12	120.00	52	50	49	45	42	38	35
2.5	1.2	12.00	868	866	863	857	852	846	840
2.5	4	40.00	260	258	255	249	243	238	232
2.5	12	120.00	86	84	81	75	70	64	58
2.5	32	320.00	32	30	27	21	15	10	4
4	1.2	12.00	1389	1386	1381	1372	1363	1354	1344
4	4	40.00	416	412	408	399	390	381	371
4	12	120.00	138	134	130	121	112	103	93
4	32	320.00	51	48	43	34	25	16	7
6	1.2	12.00	2080	2075	2068	2054	2040	2027	2013
6	4	40.00	623	618	611	597	583	570	556
6	12	120.00	207	201	194	181	167	153	140
6	32	320.00	77	71	64	51	37	23	10

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE12/XTU(A) and PKE32/XTU(A); trip class 20



Wire size S [mm ²]	Rated current PKE12(32)...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	1.2	14.40	434	433	431	427	424	421	417
1.5	4	48.00	130	129	127	123	120	117	113
1.5	12	144.00	43	42	40	37	33	30	26
2.5	1.2	14.40	723	721	718	712	707	701	695
2.5	4	48.00	217	214	211	206	200	194	189
2.5	12	144.00	72	70	67	61	55	50	44
2.5	32	384.00	27	24	21	16	10	4	-
4	1.2	14.40	1158	1154	1149	1140	1131	1122	1113
4	4	48.00	347	343	338	329	320	311	302
4	12	144.00	115	111	107	98	88	79	70
4	32	384.00	43	39	34	25	16	7	-
6	1.2	14.40	1733	1728	1721	1707	1693	1680	1666
6	4	48.00	519	514	507	493	479	466	452
6	12	144.00	172	167	160	146	132	119	105
6	32	384.00	64	58	51	38	24	10	-

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE32/XTUCP(A) and PKE65/XTU(W)CP(A)



Wire size S [mm ²]	Rated current PKE ...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	36	75.00	83	82	80	77	73	70	66
1.5	36	288.00	21	20	18	15	11	8	5
1.5	12	186.00	33	32	30	27	23	20	17
2.5	36	75.00	138	136	133	128	122	116	110
2.5	36	288.00	36	33	30	25	19	13	8
4	36	75.00	222	218	213	204	195	186	177
4	36	288.00	57	53	49	40	31	21	12
4	65	150.00	110	107	102	93	84	75	66
4	65	520.00	31	28	23	14	5	-	-
6	36	75.00	332	326	319	306	292	278	265
6	36	288.00	85	80	73	59	46	32	18
6	65	150.00	165	160	153	139	126	112	98
6	65	520.00	47	41	34	21	7	-	-
10	36	75.00	540	532	520	498	476	454	431
10	36	288.00	139	130	119	97	75	52	30
10	65	150.00	269	260	249	227	205	182	160
10	65	520.00	76	67	56	34	11	-	-
16	36	75.00	856	842	824	789	754	719	683
16	36	288.00	220	206	189	153	118	83	48
16	65	150.00	426	412	395	359	324	289	253
16	65	520.00	120	106	89	53	18	-	-
25	36	75.00	1346	1324	1296	1240	1185	1130	1074
25	36	288.00	346	324	296	241	186	130	75
25	65	150.00	670	648	620	565	509	454	398
25	65	520.00	189	167	139	84	29	-	-
35	36	75.00	1848	1817	1779	1703	1627	1551	1475
35	36	288.00	476	445	407	331	255	179	103
35	65	150.00	920	890	851	775	699	623	547
35	65	520.00	260	230	191	115	39	-	-



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE65/XTU(W)(A)

Wire size S [mm ²]	Rated current PKE65...	Trip CLASS	Response value at t=5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
				10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
4	65	5	390	42	38	34	25	15	6	-
6	65	5	390	63	57	50	37	23	9	-
10	65	5	390	102	93	82	60	38	15	-
16	65	5	390	162	148	130	95	60	24	-
25	65	5	390	254	232	204	149	94	38	-
35	65	5	390	349	319	281	205	128	52	-
4	65	10	585	28	24	19	10	1	-	-
6	65	10	585	41	36	29	15	2	-	-
10	65	10	585	67	58	47	25	3	-	-
16	65	10	585	107	93	75	40	4	-	-
25	65	10	585	168	146	118	62	7	-	-
35	65	10	585	230	200	162	86	10	-	-
4	65	15	650	25	21	17	7	-	-	-
6	65	15	650	37	32	25	11	-	-	-
10	65	15	650	60	51	40	18	-	-	-
16	65	15	650	96	82	64	29	-	-	-
25	65	15	650	150	128	100	45	-	-	-
35	65	15	650	206	176	138	62	-	-	-
4	65	15	780	20	17	12	3	-	-	-
6	65	15	780	31	25	18	5	-	-	-
10	65	15	780	50	41	30	8	-	-	-
16	65	15	780	79	65	47	12	-	-	-
25	65	15	780	124	102	74	19	-	-	-
35	65	15	780	171	140	102	26	-	-	-



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with PKE32/XTUCP(A) and PKE65/XTU(W)CP(A)

Wire size S [mm ²]	Rated current PKE ...	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
2.5	36	216.00	48	45	43	37	31	25	20
4	36	216.00	76	73	68	59	50	41	32
4	65	390.00	42	38	34	25	15	6	-
6	36	216.00	114	109	102	88	75	61	47
6	65	390.00	63	57	50	37	23	9	-
10	36	216.00	186	177	166	144	122	99	77
10	65	390.00	102	93	82	60	38	15	-
16	36	216.00	295	281	263	228	193	157	122
16	65	390.00	162	148	130	95	60	24	-
25	36	216.00	464	441	414	358	303	247	192
25	65	390.00	254	232	204	149	94	38	-
35	36	216.00	637	606	568	492	416	340	264
35	65	390.00	349	319	281	205	128	52	-

Switch-off time in the event of a short circuit < 0.4 sec



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with FAZ..., PLS..., PL... (excluding mMCT) B characteristic

Wire size S [mm ²]	Rated current	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	1	5.00	1250	1249	1247	1244	1240	1237	1233
1.5	2	10.00	625	624	622	618	615	612	608
1.5	3	15.00	417	415	413	410	407	403	400
1.5	4	20.00	312	311	309	306	302	299	296
1.5	6	30.00	208	207	205	202	198	195	191
1.5	10	50.00	125	123	122	118	115	111	108
1.5	12	60.00	104	103	101	97	94	91	87
1.5	13	65.00	96	94	93	89	86	83	79
1.5	15	75.00	83	82	80	77	73	70	66
1.5	16	80.00	78	76	75	71	68	64	61
1.5	20	100.00	62	61	59	56	52	49	45
1.5	25	125.00	50	48	47	43	40	36	33
1.5	32	160.00	39	37	36	32	29	25	22
2.5	1	5.00	2084	2082	2079	2073	2068	2062	2056
2.5	2	10.00	1042	1039	1037	1031	1025	1020	1014
2.5	3	15.00	694	692	689	683	678	672	666
2.5	4	20.00	521	518	515	510	504	498	493
2.5	6	30.00	347	345	342	336	330	325	319
2.5	10	50.00	208	206	203	197	191	186	180
2.5	12	60.00	173	171	168	162	157	151	145
2.5	13	65.00	160	158	155	149	143	138	132
2.5	15	75.00	138	136	133	128	122	116	110
2.5	16	80.00	130	127	125	119	113	107	102
2.5	20	100.00	104	101	99	93	87	81	76
2.5	25	125.00	83	81	78	72	66	61	55
2.5	32	160.00	65	62	59	54	48	42	37
4	1	5.00	3335	3332	3327	3318	3309	3300	3291
4	2	10.00	1667	1664	1659	1650	1641	1632	1623
4	3	15.00	1111	1108	1103	1094	1085	1076	1066
4	4	20.00	833	830	825	816	807	798	788
4	6	30.00	555	551	547	538	529	520	510
4	10	50.00	333	329	325	315	306	297	288
4	12	60.00	277	273	269	260	251	242	232
4	13	65.00	256	252	248	238	229	220	211
4	15	75.00	222	218	213	204	195	186	177
4	16	80.00	208	204	199	190	181	172	163
4	20	100.00	166	162	158	149	139	130	121
4	25	125.00	133	129	124	115	106	97	88
4	32	160.00	103	100	95	86	77	68	59
6	1	5.00	4994	4988	4982	4968	4954	4941	4927
6	2	10.00	2496	2491	2484	2470	2457	2443	2429
6	3	15.00	1664	1658	1651	1638	1624	1610	1597
6	4	20.00	1247	1242	1235	1221	1208	1194	1181
6	6	30.00	831	826	819	805	792	778	764
6	10	50.00	498	493	486	472	459	445	431
6	12	60.00	415	409	403	389	375	362	348
6	13	65.00	383	377	371	357	343	330	316
6	15	75.00	332	326	319	306	292	278	265
6	16	80.00	311	305	299	285	271	258	244
6	20	100.00	248	243	236	222	209	195	181
6	25	125.00	198	193	186	172	159	145	132
6	32	160.00	155	149	142	129	115	101	88



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with FAZ..., PLS..., PL... (excluding mMCT) C characteristic

Wire size S [mm ²]	Rated current	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	0.5	5.00	1250	1249	1247	1244	1240	1237	1233
1.5	1	10.00	625	624	622	618	615	612	608
1.5	1.6	16.00	390	389	387	384	381	377	374
1.5	2	20.00	312	311	309	306	302	299	296
1.5	3	30.00	208	207	205	202	198	195	191
1.5	4	40.00	156	155	153	149	146	143	139
1.5	6	60.00	104	103	101	97	94	91	87
1.5	8	80.00	78	76	75	71	68	64	61
1.5	10	100.00	62	61	59	56	52	49	45
1.5	13	130.00	48	46	45	41	38	34	31
1.5	16	160.00	39	37	36	32	29	25	22
1.5	20	200.00	31	30	28	24	21	18	14
1.5	25	250.00	25	23	22	18	15	11	8
1.5	32	320.00	19	18	16	13	9	6	2
2.5	0.5	5.00	2084	2082	2079	2073	2068	2062	2056
2.5	1	10.00	1042	1039	1037	1031	1025	1020	1014
2.5	1.6	16.00	651	649	646	640	634	629	623
2.5	2	20.00	521	518	515	510	504	498	493
2.5	3	30.00	347	345	342	336	330	325	319
2.5	4	40.00	260	258	255	249	243	238	232
2.5	6	60.00	173	171	168	162	157	151	145
2.5	8	80.00	130	127	125	119	113	107	102
2.5	10	100.00	104	101	99	93	87	81	76
2.5	13	130.00	80	77	74	69	63	57	52
2.5	16	160.00	65	62	59	54	48	42	37
2.5	20	200.00	52	49	46	41	35	29	24
2.5	25	250.00	41	39	36	30	25	19	13
2.5	32	320.00	32	30	27	21	15	10	4
4	0.5	5.00	3335	3332	3327	3318	3309	3300	3291
4	1	10.00	1667	1664	1659	1650	1641	1632	1623
4	1.6	16.00	1042	1038	1033	1024	1015	1006	997
4	2	20.00	833	830	825	816	807	798	788
4	3	30.00	555	551	547	538	529	520	510
4	4	40.00	416	412	408	399	390	381	371
4	6	60.00	277	273	269	260	251	242	232
4	8	80.00	208	204	199	190	181	172	163
4	10	100.00	166	162	158	149	139	130	121
4	13	130.00	127	124	119	110	101	92	83
4	16	160.00	103	100	95	86	77	68	59
4	20	200.00	82	79	74	65	56	47	38
4	25	250.00	66	62	58	48	39	30	21
4	32	320.00	51	48	43	34	25	16	7
6	0.5	5.00	4994	4988	4982	4968	4954	4941	4927
6	1	10.00	2496	2491	2484	2470	2457	2443	2429
6	1.6	16.00	1560	1554	1547	1534	1520	1506	1493
6	2	20.00	1247	1242	1235	1221	1208	1194	1181
6	3	30.00	831	826	819	805	792	778	764
6	4	40.00	623	618	611	597	583	570	556
6	6	60.00	415	409	403	389	375	362	348
6	8	80.00	311	305	299	285	271	258	244
6	10	100.00	248	243	236	222	209	195	181
6	13	130.00	191	185	178	165	151	137	124
6	16	160.00	155	149	142	129	115	101	88
6	20	200.00	124	118	111	98	84	70	57
6	25	250.00	99	93	86	73	59	45	32
6	32	320.00	77	71	64	51	37	23	10

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with FAZ..., PLS..., PL... or MMC... (excluding mMCT) D characteristic



Wire size S [mm ²]	Rated current	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
1.5	6	120.00	52	50	49	45	42	38	35
1.5	8	160.00	39	37	36	32	29	25	22
1.5	10	200.00	31	30	28	24	21	18	14
1.5	13	260.00	24	22	21	17	14	10	7
1.5	16	320.00	19	18	16	13	9	6	2
1.5	20	400.00	15	14	12	9	5	2	-
1.5	25	500.00	12	11	9	6	2	-	-
1.5	32	640.00	9	8	6	3	-	-	-
2.5	6	120.00	86	84	81	75	70	64	58
2.5	8	160.00	65	62	59	54	48	42	37
2.5	10	200.00	52	49	46	41	35	29	24
2.5	13	260.00	40	37	34	29	23	17	12
2.5	16	320.00	32	30	27	21	15	10	4
2.5	20	400.00	25	23	20	15	9	3	-
2.5	25	500.00	20	18	15	9	4	-	-
2.5	32	640.00	16	13	11	5	-	-	-
4	6	120.00	138	134	130	121	112	103	93
4	8	160.00	103	100	95	86	77	68	59
4	10	200.00	82	79	74	65	56	47	38
4	13	260.00	63	60	55	46	37	28	19
4	16	320.00	51	48	43	34	25	16	7
4	20	400.00	41	37	33	23	14	5	-
4	25	500.00	32	29	24	15	6	-	-
4	32	640.00	25	22	17	8	-	-	-
6	6	120.00	207	201	194	181	167	153	140
6	8	160.00	155	149	142	129	115	101	88
6	10	200.00	124	118	111	98	84	70	57
6	13	260.00	95	89	82	69	55	41	28
6	16	320.00	77	71	64	51	37	23	10
6	20	400.00	61	56	49	35	21	8	-
6	25	500.00	49	43	36	23	9	-	-
6	32	640.00	38	32	25	12	-	-	-

PLHT, AZ, mMCT 20-125A / max. Cable length for t <0.4s

wire size S mm ²	Rated current A	Trip Char	Instantaneous release response value t=0.4s A	max. cable length (m), if the loop impedance up to the protective device is Zv. (calculated with cable resistance acc. VDE 0295 @70°C)						
				10mOhm	50mOhm	100mOhm	200mOhm	300mOhm	400mOhm	500mOhm
				L cable	L cable	L cable	L cable	L cable	L cable	L cable
m	m	m	m	m	m	m				
1.5	20	B	100	62	61	60	57	54	51	48
1.5	25	B	125	50	49	47	44	42	39	36
2.5	20	B	100	102	100	98	93	88	84	79
2.5	25	B	125	81	80	77	73	68	63	58
2.5	32	B	160	64	62	59	55	50	45	41
4	20	B	100	164	161	157	150	142	134	127
4	25	B	125	131	128	124	117	109	102	94
4	32	B	160	102	99	95	88	80	73	65
4	40	B	200	82	79	75	67	60	52	45
6	20	B	100	245	241	235	224	213	201	190
6	25	B	125	196	192	186	175	163	152	141
6	32	B	160	153	148	143	131	120	109	98
6	40	B	200	122	118	112	101	89	78	67
6	50	B	250	98	93	87	76	65	53	42
10	20	B	100	413	405	396	377	358	339	320
10	25	B	125	330	322	313	294	275	256	237
10	32	B	160	257	250	240	221	202	183	164
10	40	B	200	206	198	188	169	150	131	112
10	50	B	250	164	156	147	128	109	90	71
10	63	B	315	130	122	113	94	75	56	37
10	80	B	400	102	94	85	66	47	28	9
16	32	B	160	410	397	382	352	322	291	261
16	20	B	100	657	645	630	600	569	539	509
16	40	B	200	327	315	300	270	239	209	179
16	50	B	250	261	249	234	204	173	143	113
16	63	B	315	207	195	179	149	119	89	58
16	80	B	400	162	150	135	105	74	44	14
16	100	B	500	129	117	102	72	41	11	x
25	20	B	100	1040	1021	997	949	901	853	805
25	32	B	160	648	629	605	557	509	461	413
25	40	B	200	517	498	474	426	379	331	283
25	50	B	250	413	394	370	322	274	226	178
25	63	B	315	327	308	284	236	188	140	92
25	80	B	400	256	237	213	165	118	70	22
25	100	B	500	204	185	161	113	65	17	x
25	125	B	625	162	143	119	71	23	x	x
35	20	B	100	1442	1416	1383	1316	1250	1183	1117
35	32	B	160	899	872	839	773	706	640	573
35	40	B	200	718	691	658	592	525	459	392
35	50	B	250	573	547	513	447	380	314	248
35	63	B	315	454	427	394	327	261	194	128
35	80	B	400	356	329	296	230	163	97	30
35	100	B	500	283	257	223	157	91	24	x
35	125	B	625	225	199	165	99	32	x	x
50	20	B	100	1953	1917	1872	1782	1692	1602	1512
50	32	B	160	1217	1181	1136	1046	956	866	776
50	40	B	200	972	936	891	801	711	621	531
50	50	B	250	776	740	695	605	515	425	335
50	63	B	315	614	578	533	443	353	263	173
50	80	B	400	482	446	401	311	221	131	41
50	100	B	500	384	348	303	213	123	33	x
50	125	B	625	305	269	224	134	44	x	x

PLHT, AZ, mMCT 20-125A / max. Cable length for t <0.4s

wire size S mm ²	Rated current A	Trip Char	Instantaneous release response value t=0.4s A	max. cable length (m), if the loop impedance up to the protective device is Zv. (calculated with cable resistance acc. VDE 0295 @70°C)						
				10mOhm	50mOhm	100mOhm	200mOhm	300mOhm	400mOhm	500mOhm
				L cable	L cable	L cable	L cable	L cable	L cable	L cable
				m	m	m	m	m	m	m
1.5	20	C	200	31	30	28	26	23	20	17
1.5	25	C	250	25	24	22	19	16	14	11
2.5	20	C	200	51	49	46	42	37	32	28
2.5	25	C	250	40	39	36	31	27	22	17
2.5	32	C	320	31	30	27	23	18	13	8
4	20	C	200	81	78	75	67	60	52	44
4	25	C	250	65	62	58	51	43	35	28
4	32	C	320	51	48	44	36	29	21	14
4	40	C	400	40	37	34	26	18	11	3
6	20	C	200	122	117	112	100	89	78	66
6	25	C	250	97	93	87	76	64	53	42
6	32	C	320	76	71	66	54	43	32	20
6	40	C	400	60	56	50	39	28	16	5
6	50	C	500	48	44	38	27	15	4	x
10	20	C	200	205	198	188	169	150	131	112
10	25	C	250	164	156	147	127	108	89	70
10	32	C	320	127	120	110	91	72	53	34
10	40	C	400	102	94	84	65	46	27	8
10	50	C	500	81	73	64	45	26	7	x
10	63	C	630	64	56	47	28	9	x	x
10	80	C	800	50	42	33	14	x	x	x
16	32	C	320	203	191	176	145	115	85	54
16	20	C	200	326	314	299	269	239	208	178
16	40	C	400	162	150	134	104	74	44	13
16	50	C	500	129	117	102	71	41	11	x
16	63	C	630	102	90	74	44	14	x	x
16	80	C	800	79	67	52	22	x	x	x
16	100	C	1000	63	51	36	5	x	x	x
25	20	C	200	516	497	473	425	377	330	282
25	32	C	320	321	302	278	230	182	134	86
25	40	C	400	256	237	213	165	117	69	21
25	50	C	500	204	185	161	113	65	17	x
25	63	C	630	161	142	118	70	22	x	x
25	80	C	800	126	106	82	35	x	x	x
25	100	C	1000	99	80	56	8	x	x	x
25	125	C	1250	79	59	35	x	x	x	x
35	20	C	200	716	690	657	590	524	457	391
35	32	C	320	445	418	385	319	252	186	119
35	40	C	400	355	328	295	229	162	96	29
35	50	C	500	283	256	223	157	90	24	x
35	63	C	630	223	197	163	97	30	x	x
35	80	C	800	174	148	114	48	x	x	x
35	100	C	1000	138	111	78	12	x	x	x
35	125	C	1250	109	82	49	x	x	x	x
50	20	C	200	970	934	889	799	709	619	529
50	32	C	320	603	567	522	432	342	252	162
50	40	C	400	480	444	399	309	220	130	40
50	50	C	500	383	347	302	212	122	32	x
50	63	C	630	302	266	221	131	41	x	x
50	80	C	800	236	200	155	65	x	x	x
50	100	C	1000	187	151	106	16	x	x	x
50	125	C	1250	148	112	67	x	x	x	x

PLHT, AZ, mMCT 20-125A / max. Cable length for t <0.4s

wire size S mm ²	Rated current A	Trip Char	Instantaneous release response value t=0.4s A	max. cable length (m), if the loop impedance up to the protective device is Z _v . (calculated with cable resistance acc. VDE 0295 @70°C)						
				10mOhm	50mOhm	100mOhm	200mOhm	300mOhm	400mOhm	500mOhm
				L cable	L cable	L cable	L cable	L cable	L cable	L cable
				m	m	m	m	m	m	m
1.5	20	D	400	15	14	13	10	7	4	1
1.5	25	D	500	12	11	10	7	4	1	x
2.5	20	D	400	25	23	21	16	11	7	2
2.5	25	D	500	20	18	16	11	6	2	x
2.5	32	D	640	15	14	11	6	2	x	x
4	20	D	400	40	37	33	26	18	11	3
4	25	D	500	32	29	25	18	10	2	x
4	32	D	640	25	22	18	10	3	x	x
4	40	D	800	20	17	13	5	x	x	x
6	20	D	400	60	56	50	39	27	16	5
6	25	D	500	48	43	38	26	15	4	x
6	32	D	640	37	33	27	16	4	x	x
6	40	D	800	29	25	19	8	x	x	x
6	50	D	1000	23	19	13	2	x	x	x
10	20	D	400	101	94	84	65	46	27	8
10	25	D	500	80	73	63	44	25	6	x
10	32	D	640	62	55	45	26	7	x	x
10	40	D	800	50	42	33	13	x	x	x
10	50	D	1000	39	32	22	3	x	x	x
10	63	D	1260	31	23	14	x	x	x	x
10	80	D	1600	24	16	7	x	x	x	x
16	32	D	640	99	87	72	42	12	x	x
16	20	D	400	161	149	134	103	73	43	13
16	40	D	800	79	67	52	21	x	x	x
16	50	D	1000	63	51	35	5	x	x	x
16	63	D	1260	49	37	22	x	x	x	x
16	80	D	1600	38	26	11	x	x	x	x
16	100	D	2000	30	18	3	x	x	x	x
25	20	D	400	255	236	212	164	116	68	20
25	32	D	640	157	138	114	66	18	x	x
25	40	D	800	125	106	82	34	x	x	x
25	50	D	1000	99	80	56	8	x	x	x
25	63	D	1260	78	59	35	x	x	x	x
25	80	D	1600	60	41	17	x	x	x	x
25	100	D	2000	47	28	4	x	x	x	x
35	20	D	400	353	327	294	227	161	94	28
35	32	D	640	218	192	158	92	25	x	x
35	40	D	800	173	147	114	47	x	x	x
35	50	D	1000	138	111	78	11	x	x	x
35	63	D	1260	108	81	48	x	x	x	x
35	80	D	1600	84	57	24	x	x	x	x
35	100	D	2000	65	39	6	x	x	x	x
50	20	D	400	478	442	398	308	218	128	38
50	32	D	640	295	259	214	124	34	x	x
50	40	D	800	235	199	154	64	x	x	x
50	50	D	1000	186	150	105	15	x	x	x
50	63	D	1260	146	110	65	x	x	x	x
50	80	D	1600	113	77	32	x	x	x	x
50	100	D	2000	89	53	8	x	x	x	x

Switch-off time in the event of a short circuit 5 sec



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with FAZ..., PLS..., PL... (excluding mMCT) B characteristic

Wire size S [mm ²]	Rated current [A]	[A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
4	32	160.00	103	100	95	86	77	68	59
4	40	200.00	82	79	74	65	56	47	38
4	50	250.00	66	62	58	48	39	30	21
4	63	315.00	52	48	44	35	26	16	7
6	32	160.00	155	149	142	129	115	101	88
6	40	200.00	124	118	111	98	84	70	57
6	50	250.00	99	93	86	73	59	45	32
6	63	315.00	78	72	66	52	38	25	11
10	32	160.00	252	243	232	210	188	165	143
10	40	200.00	201	192	181	159	137	114	92
10	50	250.00	161	152	141	118	96	74	51
10	63	315.00	127	118	107	85	62	40	18
16	32	160.00	399	385	368	332	297	262	227
16	40	200.00	319	305	287	252	217	181	146
16	50	250.00	254	240	223	187	152	117	82
16	63	315.00	201	187	169	134	99	64	28

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with FAZ..., PLS..., PL... (excluding mMCT) C/D characteristic



Wire size S [mm ²]	Rated current [A]	Response value at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
4	32	192.00	86	82	78	69	60	50	41
4	40	240.00	69	65	60	51	42	33	24
4	50	300.00	55	51	46	37	28	19	10
4	63	378.00	43	40	35	26	17	8	-
6	32	192.00	129	123	116	103	89	75	62
6	40	240.00	103	97	90	77	63	49	36
6	50	300.00	82	76	70	56	42	29	15
6	63	378.00	65	59	52	39	25	11	-
10	32	192.00	210	201	190	167	145	123	101
10	40	240.00	167	158	147	125	103	81	58
10	50	300.00	133	125	113	91	69	47	24
10	63	378.00	105	97	85	63	41	19	-
16	32	192.00	332	318	301	265	230	195	159
16	40	240.00	265	251	233	198	163	128	92
16	50	300.00	211	197	180	144	109	74	39
16	63	378.00	167	153	135	100	65	30	-

PLHT, AZ, mMCT 32-125A / max. Cable length for t < 5s

wire size S mm ²	Rated current A	Trip Char	Instantaneous release response value t=5s A	max. cable length (m), if the loop impedance up to the protective device is Z _v . (calculated with cable resistance acc. VDE 0295 @70°C)						
				10mOhm	50mOhm	100mOhm	200mOhm	300mOhm	400mOhm	500mOhm
				L cable	L cable	L cable	L cable	L cable	L cable	L cable
m	m	m	m	m	m	m	m			
2.5	32	B	160	64	62	59	55	50	45	41
4	32	B	160	102	99	95	88	80	73	65
4	40	B	200	82	79	75	67	60	52	45
6	32	B	160	153	148	143	131	120	109	98
6	40	B	200	122	118	112	101	89	78	67
6	50	B	250	98	93	87	76	65	53	42
10	32	B	160	257	250	240	221	202	183	164
10	40	B	200	206	198	188	169	150	131	112
10	50	B	250	164	156	147	128	109	90	71
10	63	B	315	130	122	113	94	75	56	37
10	80	B	400	102	94	85	66	47	28	9
16	32	B	160	410	397	382	352	322	291	261
16	40	B	200	327	315	300	270	239	209	179
16	50	B	250	261	249	234	204	173	143	113
16	63	B	315	207	195	179	149	119	89	58
16	80	B	400	162	150	135	105	74	44	14
16	100	B	500	129	117	102	72	41	11	x
25	32	B	160	648	629	605	557	509	461	413
25	40	B	200	517	498	474	426	379	331	283
25	50	B	250	413	394	370	322	274	226	178
25	63	B	315	327	308	284	236	188	140	92
25	80	B	400	256	237	213	165	118	70	22
25	100	B	500	204	185	161	113	65	17	x
25	125	B	625	162	143	119	71	23	x	x
35	32	B	160	899	872	839	773	706	640	573
35	40	B	200	718	691	658	592	525	459	392
35	50	B	250	573	547	513	447	380	314	248
35	63	B	315	454	427	394	327	261	194	128
35	80	B	400	356	329	296	230	163	97	30
35	100	B	500	283	257	223	157	91	24	x
35	125	B	625	225	199	165	99	32	x	x
50	32	B	160	1217	1181	1136	1046	956	866	776
50	40	B	200	972	936	891	801	711	621	531
50	50	B	250	776	740	695	605	515	425	335
50	63	B	315	614	578	533	443	353	263	173
50	80	B	400	482	446	401	311	221	131	41
50	100	B	500	384	348	303	213	123	33	x
50	125	B	625	305	269	224	134	44	x	x

PLHT, AZ, mMCT 32-125A / max. Cable length for t < 5s

wire size S mm ²	Rated current A	Trip Char	Instantaneous release response value t=5s A	max. cable length (m), if the loop impedance up to the protective device is Z _v . (calculated with cable resistance acc. VDE 0295 @70°C)						
				10mOhm	50mOhm	100mOhm	200mOhm	300mOhm	400mOhm	500mOhm
				L cable	L cable	L cable	L cable	L cable	L cable	L cable
				m	m	m	m	m	m	m
2.5	32	C, D	307.2	33	31	29	24	19	14	10
4	32	C, D	307.2	53	50	46	38	31	23	16
4	40	C, D	384	42	39	35	28	20	13	5
6	32	C, D	307.2	79	74	69	57	46	35	24
6	40	C, D	384	63	58	53	41	30	19	8
6	50	C, D	480	50	46	40	29	17	6	x
10	32	C, D	307.2	133	125	116	97	78	59	40
10	40	C, D	384	106	98	89	70	51	32	13
10	50	C, D	480	84	77	67	48	29	10	x
10	63	C, D	604.8	67	59	50	30	11	x	x
10	80	C, D	768	52	44	35	16	x	x	x
16	32	C, D	307.2	211	199	184	154	124	93	63
16	40	C, D	384	169	156	141	111	81	50	20
16	50	C, D	480	134	122	107	77	47	16	x
16	63	C, D	604.8	106	94	79	49	18	x	x
16	80	C, D	768	83	71	56	25	x	x	x
16	100	C, D	960	66	54	38	8	x	x	x
25	32	C, D	307.2	334	315	291	243	195	148	100
25	40	C, D	384	267	248	224	176	128	80	32
25	50	C, D	480	213	193	169	122	74	26	x
25	63	C, D	604.8	168	149	125	77	29	x	x
25	80	C, D	768	131	112	88	40	x	x	x
25	100	C, D	960	104	85	61	13	x	x	x
25	125	C, D	1200	82	63	39	x	x	x	x
35	32	C, D	307.2	464	437	404	338	271	205	138
35	40	C, D	384	370	343	310	244	177	111	44
35	50	C, D	480	295	268	235	169	102	36	x
35	63	C, D	604.8	233	206	173	106	40	x	x
35	80	C, D	768	182	155	122	56	x	x	x
35	100	C, D	960	144	117	84	18	x	x	x
35	125	C, D	1200	114	87	54	x	x	x	x
50	32	C, D	307.2	628	592	547	457	367	277	187
50	40	C, D	384	501	465	420	330	240	150	60
50	50	C, D	480	399	363	318	228	138	48	x
50	63	C, D	604.8	315	279	234	144	54	x	x
50	80	C, D	768	246	210	165	75	x	x	x
50	100	C, D	960	195	159	114	24	x	x	x
50	125	C, D	1200	154	118	73	x	x	x	x

Switch-off time in the event of a short circuit 5 sec



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with NZM... 1 ...A(M)

Wire size S [mm ²]	Rated current NZM...1...	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
10	32	320.00	125	116	105	83	60	38	16
10	40	400.00	100	91	79	57	35	13	-
10	50	500.00	79	70	59	37	15	-	-
10	63	630.00	62	53	42	20	-	-	-
10	80	800.00	49	40	29	6	-	-	-
10	100	1,000.00	38	30	18	-	-	-	-
10	125	1,250.00	30	21	10	-	-	-	-
10	160	1,600.00	23	14	3	-	-	-	-
16	32	320.00	198	184	166	131	96	60	25
16	40	400.00	158	144	126	91	55	20	-
16	50	500.00	125	111	94	58	23	-	-
16	63	630.00	99	85	67	32	-	-	-
16	80	800.00	77	63	45	10	-	-	-
16	100	1,000.00	61	47	29	-	-	-	-
16	125	1,250.00	48	34	16	-	-	-	-
16	160	1,600.00	37	23	5	-	-	-	-
25	32	320.00	311	289	261	206	150	95	40
25	40	400.00	248	226	198	142	87	32	-
25	50	500.00	197	175	147	92	36	-	-
25	63	630.00	155	133	105	50	-	-	-
25	80	800.00	121	99	71	16	-	-	-
25	100	1,000.00	96	74	46	-	-	-	-
25	125	1,250.00	76	53	26	-	-	-	-
25	160	1,600.00	58	36	8	-	-	-	-
35	32	320.00	427	397	359	283	206	130	54
35	40	400.00	340	310	272	196	120	43	-
35	50	500.00	271	240	202	126	50	-	-
35	63	630.00	213	183	145	69	-	-	-
35	80	800.00	166	136	98	22	-	-	-
35	100	1,000.00	132	101	63	-	-	-	-
35	125	1,250.00	104	73	35	-	-	-	-
35	160	1,600.00	79	49	11	-	-	-	-
50	32	320.00	574	533	482	380	277	175	73
50	40	400.00	457	416	365	263	161	58	-
50	50	500.00	364	323	272	169	67	-	-
50	63	630.00	287	246	194	92	-	-	-
50	80	800.00	223	183	131	29	-	-	-
50	100	1,000.00	177	136	85	-	-	-	-
50	125	1,250.00	139	98	47	-	-	-	-
50	160	1,600.00	107	66	15	-	-	-	-
70	32	320.00	811	753	681	537	392	248	103
70	40	400.00	646	588	516	371	227	82	-
70	50	500.00	514	456	384	239	95	-	-
70	63	630.00	405	347	275	130	-	-	-
70	80	800.00	316	258	186	41	-	-	-
70	100	1,000.00	250	192	120	-	-	-	-
70	125	1,250.00	197	139	67	-	-	-	-
70	160	1,600.00	151	93	21	-	-	-	-

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with NZM...2...A(M)



Wire size S [mm ²]	Rated current NZM...2...	Instantaneous release response value [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z _v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
10	32	320.00	125	116	105	83	60	38	16
10	40	400.00	100	91	79	57	35	13	-
10	50	500.00	79	70	59	37	15	-	-
10	63	630.00	62	53	42	20	-	-	-
10	80	800.00	49	40	29	6	-	-	-
10	100	1,000.00	38	30	18	-	-	-	-
10	125	1,250.00	30	21	10	-	-	-	-
10	160	1,600.00	23	14	3	-	-	-	-
10	200	2,000.00	18	9	-	-	-	-	-
10	250	2,500.00	14	5	-	-	-	-	-
10	300	3,000.00	11	2	-	-	-	-	-
16	32	320.00	198	184	166	131	96	60	25
16	40	400.00	158	144	126	91	55	20	-
16	50	500.00	125	111	94	58	23	-	-
16	63	630.00	99	85	67	32	-	-	-
16	80	800.00	77	63	45	10	-	-	-
16	100	1,000.00	61	47	29	-	-	-	-
16	125	1,250.00	48	34	16	-	-	-	-
16	160	1,600.00	37	23	5	-	-	-	-
16	200	2,000.00	29	15	-	-	-	-	-
16	250	2,500.00	22	8	-	-	-	-	-
16	300	3,000.00	18	4	-	-	-	-	-
25	32	320.00	311	289	261	206	150	95	40
25	40	400.00	248	226	198	142	87	32	-
25	50	500.00	197	175	147	92	36	-	-
25	63	630.00	155	133	105	50	-	-	-
25	80	800.00	121	99	71	16	-	-	-
25	100	1,000.00	96	74	46	-	-	-	-
25	125	1,250.00	76	53	26	-	-	-	-
25	160	1,600.00	58	36	8	-	-	-	-
25	200	2,000.00	45	23	-	-	-	-	-
25	250	2,500.00	35	13	-	-	-	-	-
25	300	3,000.00	28	6	-	-	-	-	-
35	32	320.00	427	397	359	283	206	130	54
35	40	400.00	340	310	272	196	120	43	-
35	50	500.00	271	240	202	126	50	-	-
35	63	630.00	213	183	145	69	-	-	-
35	80	800.00	166	136	98	22	-	-	-
35	100	1,000.00	132	101	63	-	-	-	-
35	125	1,250.00	104	73	35	-	-	-	-
35	160	1,600.00	79	49	11	-	-	-	-
35	200	2,000.00	62	32	-	-	-	-	-
35	250	2,500.00	48	18	-	-	-	-	-
35	300	3,000.00	39	8	-	-	-	-	-
70	32	320.00	811	753	681	537	392	248	103
70	40	400.00	646	588	516	371	227	82	-
70	50	500.00	514	456	384	239	95	-	-
70	63	630.00	405	347	275	130	-	-	-
70	80	800.00	316	258	186	41	-	-	-
70	100	1,000.00	250	192	120	-	-	-	-
70	125	1,250.00	197	139	67	-	-	-	-
70	160	1,600.00	151	93	21	-	-	-	-
70	200	2,000.00	118	60	-	-	-	-	-
70	250	2,500.00	91	33	-	-	-	-	-
70	300	3,000.00	74	16	-	-	-	-	-



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with NZM...2...VE

Wire size S [mm ²]	Rated current NZM...2...	Response value I _{imax} at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
10	100	200.00	201	192	181	159	137	114	92
10	160	320.00	125	116	105	83	60	38	16
10	250	500.00	79	70	59	37	15	-	-
16	100	200.00	319	305	287	252	217	181	146
16	160	320.00	198	184	166	131	96	60	25
16	250	500.00	125	111	94	58	23	-	-
25	100	200.00	501	479	451	396	340	285	230
25	160	320.00	311	289	261	206	150	95	40
25	250	500.00	197	175	147	92	36	-	-
35	100	200.00	688	658	620	543	467	391	315
35	160	320.00	427	397	359	283	206	130	54
35	250	500.00	271	240	202	126	50	-	-
70	100	200.00	1307	1249	1176	1032	887	743	598
70	160	320.00	811	753	681	537	392	248	103
70	250	500.00	514	456	384	239	95	-	-



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with NZM...3...A

Wire size S [mm ²]	Rated current NZM12	Response value I _{imax} at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Zv						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
16	320	3,200.00	17	3	-	-	-	-	-
16	400	4,000.00	13	-	-	-	-	-	-
16	500	5,000.00	9	-	-	-	-	-	-
25	320	3,200.00	26	-	-	-	-	-	-
25	400	4,000.00	20	-	-	-	-	-	-
25	500	5,000.00	15	-	-	-	-	-	-
35	320	3,200.00	36	-	-	-	-	-	-
35	400	4,000.00	27	-	-	-	-	-	-
35	500	5,000.00	20	-	-	-	-	-	-
70	320	3,200.00	68	-	-	-	-	-	-
70	400	4,000.00	52	-	-	-	-	-	-
70	500	5,000.00	38	-	-	-	-	-	-
95	320	3,200.00	92	-	-	-	-	-	-
95	400	4,000.00	69	-	-	-	-	-	-
95	500	5,000.00	52	-	-	-	-	-	-
120	320	3,200.00	112	-	-	-	-	-	-
120	400	4,000.00	85	-	-	-	-	-	-
120	500	5,000.00	63	-	-	-	-	-	-
150	320	3,200.00	135	-	-	-	-	-	-
150	400	4,000.00	103	-	-	-	-	-	-
150	500	5,000.00	76	-	-	-	-	-	-
185	320	3,200.00	159	-	-	-	-	-	-
185	400	4,000.00	121	-	-	-	-	-	-
185	500	5,000.00	90	-	-	-	-	-	-
240	320	3,200.00	190	-	-	-	-	-	-
240	400	4,000.00	144	-	-	-	-	-	-
240	500	5,000.00	107	-	-	-	-	-	-

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with NZM...3...A



Wire size S [mm ²]	Rated current NZM12	Response value $I_{i,max}$ at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z_v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
16	320	1,920.00	30	16	-	-	-	-	-
16	400	2,400.00	23	9	-	-	-	-	-
16	500	3,000.00	18	4	-	-	-	-	-
25	320	1,920.00	47	25	-	-	-	-	-
25	400	2,400.00	37	15	-	-	-	-	-
25	500	3,000.00	28	6	-	-	-	-	-
35	320	1,920.00	65	34	-	-	-	-	-
35	400	2,400.00	50	20	-	-	-	-	-
35	500	3,000.00	39	8	-	-	-	-	-
70	320	1,920.00	123	65	-	-	-	-	-
70	400	2,400.00	96	38	-	-	-	-	-
70	500	3,000.00	74	16	-	-	-	-	-
95	320	1,920.00	166	88	-	-	-	-	-
95	400	2,400.00	129	51	-	-	-	-	-
95	500	3,000.00	99	21	-	-	-	-	-
120	320	1,920.00	202	107	-	-	-	-	-
120	400	2,400.00	157	62	-	-	-	-	-
120	500	3,000.00	121	26	-	-	-	-	-
150	320	1,920.00	245	130	-	-	-	-	-
150	400	2,400.00	190	75	-	-	-	-	-
150	500	3,000.00	146	31	-	-	-	-	-
185	320	1,920.00	288	153	-	-	-	-	-
185	400	2,400.00	224	88	-	-	-	-	-
185	500	3,000.00	172	37	-	-	-	-	-
240	320	1,920.00	344	182	-	-	-	-	-
240	400	2,400.00	267	106	-	-	-	-	-
240	500	3,000.00	205	44	-	-	-	-	-



Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with NZM...3...AE

Wire size S [mm ²]	Rated current NZM12	Response value I_{tmax} at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z_v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
16	250	1,875.00	31	17	-	-	-	-	-
16	400	3,000.00	18	4	-	-	-	-	-
16	630	4,725.00	10	-	-	-	-	-	-
25	250	1,875.00	49	26	-	-	-	-	-
25	400	3,000.00	28	6	-	-	-	-	-
25	630	4,725.00	16	-	-	-	-	-	-
35	250	1,875.00	67	36	-	-	-	-	-
35	400	3,000.00	39	8	-	-	-	-	-
35	630	4,725.00	22	-	-	-	-	-	-
70	250	1,875.00	126	69	-	-	-	-	-
70	400	3,000.00	74	16	-	-	-	-	-
70	630	4,725.00	41	-	-	-	-	-	-
95	250	1,875.00	170	92	-	-	-	-	-
95	400	3,000.00	99	21	-	-	-	-	-
95	630	4,725.00	56	-	-	-	-	-	-
120	250	1,875.00	207	113	-	-	-	-	-
120	400	3,000.00	121	26	-	-	-	-	-
120	630	4,725.00	68	-	-	-	-	-	-
150	250	1,875.00	251	137	-	-	-	-	-
150	400	3,000.00	146	31	-	-	-	-	-
150	630	4,725.00	82	-	-	-	-	-	-
185	250	1,875.00	296	161	-	-	-	-	-
185	400	3,000.00	172	37	-	-	-	-	-
185	630	4,725.00	97	-	-	-	-	-	-
240	250	1,875.00	353	192	-	-	-	-	-
240	400	3,000.00	205	44	-	-	-	-	-
240	630	4,725.00	116	-	-	-	-	-	-

Protection of PVC- or rubber-insulated copper cables, maximum permissible cable length if protected with NZM...3...AE(VE)



Wire size S [mm ²]	Rated current NZM...1...	Response value $I_{i_{max}}$ at t = 5 sec [A]	Maximum cable length [m], if the loop impedance up to the protective device is Z_v						
			10 mOhm	50 mOhm	100 mOhm	200 mOhm	300 mOhm	400 mOhm	500 mOhm
16	250	500.00	125	111	94	58	23	-	-
16	400	800.00	77	63	45	10	-	-	-
16	630	1,260.00	48	34	16	-	-	-	-
25	250	500.00	197	175	147	92	36	-	-
25	400	800.00	121	99	71	16	-	-	-
25	630	1,260.00	75	53	25	-	-	-	-
35	250	500.00	271	240	202	126	50	-	-
35	400	800.00	166	136	98	22	-	-	-
35	630	1,260.00	103	72	34	-	-	-	-
70	250	500.00	514	456	384	239	95	-	-
70	400	800.00	316	258	186	41	-	-	-
70	630	1,260.00	195	137	65	-	-	-	-
95	250	500.00	692	614	517	322	128	-	-
95	400	800.00	425	347	250	56	-	-	-
95	630	1,260.00	263	185	88	-	-	-	-
120	250	500.00	843	748	630	393	156	-	-
120	400	800.00	518	423	305	68	-	-	-
120	630	1,260.00	320	225	107	-	-	-	-
150	250	500.00	1022	907	763	476	189	-	-
150	400	800.00	628	513	369	82	-	-	-
150	630	1,260.00	388	273	130	-	-	-	-
185	250	500.00	1202	1066	897	560	222	-	-
185	400	800.00	738	603	434	96	-	-	-
185	630	1,260.00	456	321	152	-	-	-	-
240	250	500.00	1434	1273	1071	668	265	-	-
240	400	800.00	881	720	518	115	-	-	-
240	630	1,260.00	545	383	182	-	-	-	-

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