

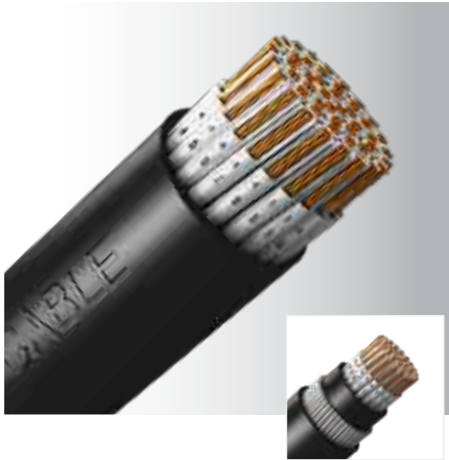
PVC Insulated Cables

0.6/1kV Multi-Core

PVC Insulated, Unarmoured & Armoured, PVC Sheathed Auxiliary Cable

Description: CU/PVC/PVC or CU/PVC/PVC/SWA/PVC-AT

Model Code: PP or PPSP-AT



Application :	This auxiliary cable is used in supervisory electrical equipment and station control circuits, as well as in light, ordinary, or heavy duty industry where power distribution device is needed to transmit control signals or measure signal operations.
Voltage rating :	0.6/1kV
Construction :	Plain annealed copper (IEC 60228 Class 2), PVC insulated, unarmoured or galvanized steel wires armoured, PVC or anti-termite PVC (for armoured cable only) sheathed cable
Insulation colour :	White (With black numbering)
Sheath colour :	Black
Specification :	IEC 60502-1, IEC 60332-1-2
Operating temperature :	70°C

No. of Core	Conductor	Insulation	Unarmoured Cable			Armoured Cable		
	Nominal Area (mm ²)	Thickness (mm)	Part No.	Approx. Overall Diam. (mm)	Approx. Weight (kg/km)	Part No.	Approx. Overall Diam. (mm)	Approx. Weight (kg/km)
5	1.5	0.8	07053009	13.3	229	07053021	17.2	538
7			07073009	14.3	282	07073021	18.2	620
10			07103009	17.5	395	07103021	22.2	932
12			07123009	18.1	438	07123021	22.7	996
19			07193009	20.8	632	07193021	26.2	1434
27			07273009	24.6	878	07273021	29.9	1801
37			07373009	28.0	1164	07373021	32.9	2180
48			07483009	32.0	1491	07483021	37.7	2910
5	2.5	0.8	08053009	14.4	292	08053021	18.3	627
7			08073009	15.5	366	08073021	20.1	847
10			08103009	19.2	516	08103021	23.8	1100
12			08123009	19.8	577	08123021	24.4	1185
19			08193009	22.9	845	08193021	28.3	1725
27			08273009	27.2	1159	08273021	32.7	2215
37			08373009	31.0	1575	08373021	36.1	2721
48			08483009	35.6	2042	08483021	42.4	3720
5	4	1.0	09053009	17.0	421	09053021	21.6	935
7			09073009	18.4	536	09073021	23.0	1103
10			09103009	23.1	764	09103021	28.4	1631
12			09123009	23.8	860	09123021	29.1	1765
19			09193009	28.3	1296	09193021	33.2	2351
27			09273009	33.9	1802	09273021	40.5	3330
37			09373009	38.3	2428	09373021	44.5	4213
48			09483009	43.9	3111	09483021	52.3	5773

Current rating and voltage drop

For Unarmoured Cable, please refer to Table 4 & 5 (Page 52)

For Armoured Cable, please refer to Table 6 & 7 (Page 53)

For Rating Factors, please refer to Table 26 (Page 63)

Current Rating and Voltage Drop

PVC Insulated Cables
Multi-Core, Unarmoured



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Multi-Core Cables with PVC Insulation, Unarmoured, PVC Outersheath 0.6/1kV

Table 4 : Current-Carrying Capacities (Amp)
[CU/PVC/PVC Cables]

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

IEC 60502-1 (BS 6346)

Conductor Cross-sectional Area	Reference Method 4 (enclosed in an insulated wall etc)		Reference Method 3 (enclosed in conduit on a wall or ceiling, or in trunking)		Reference Method 1 (clipped direct)		Reference Method 11 (on perforated cable tray), or Reference Method 13 (in free air)	
	one 2-core cable*, 1-phase a.c. or d.c.	one 3-core* or 4-core cable, 3-phase a.c.	one 2-core cable*, 1-phase a.c. or d.c.	one 3-core* or 4-core cable, 3-phase a.c.	one 2-core cable*, 1-phase a.c. or d.c.	one 3-core* or 4-core cable, 3-phase a.c.	one 2-core cable*, 1-phase a.c. or d.c.	one 3-core* or 4-core cable, 3-phase a.c.
1	2	3	4	5	6	7	8	9
mm ²	A	A	A	A	A	A	A	A
1	11	10	13	11.5	15	13.5	17	14.5
1.5	14	13	16.5	15	19.5	17.5	22	18.5
2.5	18.5	17.5	23	20	27	24	30	25
4	25	23	30	27	36	32	40	34
6	32	29	38	34	46	41	51	43
10	43	39	52	46	63	57	70	60
16	57	52	69	62	85	76	94	80
25	75	68	90	80	112	96	119	101
35	92	83	111	99	138	119	148	126
50	110	99	133	118	168	144	180	153
70	139	125	168	149	213	184	232	196
95	167	150	201	179	258	223	282	238
120	192	172	232	206	299	259	328	276
150	219	196	258	225	344	299	379	319
185	248	223	294	255	392	341	434	364
240	291	261	344	297	461	403	514	430
300	334	298	394	339	530	464	593	497
400	-	-	470	402	634	557	715	597

*With or without protective conductor

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 23 (Page 62)

Table 5 : Voltage Drop (Per Amp Per Meter)
[CU/PVC/PVC Cables]

Conductor Operating Temperature : 70°C

IEC 60502-1 (BS 6346)

Conductor Cross- sectional Area	2-core cable, d.c.	2-core cable, 1-phase a.c.			3-core or 4-core cable, 3-phase a.c.		
1	2	3			4		
mm ²	mV/A/m	mV/A/m			mV/A/m		
1	44	44			38		
1.5	29	29			25		
2.5	18	18			15		
4	11	11			9.5		
6	7.3	7.3			6.4		
10	4.4	4.4			3.8		
16	2.8	2.8			2.4		
		r	x	z	r	x	z
25	1.75	1.75	0.170	1.75	1.50	0.145	1.50
35	1.25	1.25	0.165	1.25	1.10	0.145	1.10
50	0.93	0.93	0.165	0.94	0.80	0.140	0.81
70	0.63	0.63	0.160	0.65	0.55	0.140	0.57
95	0.46	0.47	0.155	0.50	0.41	0.135	0.43
120	0.36	0.38	0.155	0.41	0.33	0.135	0.35
150	0.29	0.30	0.155	0.34	0.26	0.130	0.29
185	0.23	0.25	0.150	0.29	0.21	0.130	0.25
240	0.180	0.190	0.150	0.24	0.165	0.130	0.21
300	0.145	0.155	0.145	0.21	0.135	0.130	0.185
400	0.105	0.115	0.145	0.185	0.100	0.125	0.160

Note : r = resistive component; x = reactive component; z = impedance value

Current Rating and Voltage Drop

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Multi-Core, Armoured



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Multi-Core Cables with PVC Insulation, Armoured, PVC Outersheath 0.6/1kV

Table 6 : Current-Carrying Capacities (Amp)
[CU/PVC/PVC/SWA/PVC Cables]

Conductor Operating Temperature : 70°C

IEC 60502-1 (BS 6346)

Ambient Temperature : 30°C

Ground Temperature : 15°C

Depth of Laying : 0.5m

Soil Thermal Resistivity : 1.2 k•m/W

Conductor Cross-sectional Area	Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated horizontal cable tray) or Reference Method 13 (in free air)		Direct in ground		In single way ducts	
	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.
1	2	3	4	5	6	7	8	9
mm ²	A	A	A	A	A	A	A	A
1.5	21	18	22	19	32	27	26	22
2.5	28	25	31	26	41	35	34	29
4	38	33	41	35	55	47	45	38
6	49	42	53	45	69	59	57	48
10	67	58	72	62	92	78	76	64
16	89	77	97	83	119	101	98	83
25	118	102	128	110	158	132	129	107
35	145	125	157	135	190	159	154	126
50	175	151	190	163	225	188	183	153
70	222	192	241	207	277	233	225	190
95	269	231	291	251	332	279	271	228
120	310	267	336	290	377	317	309	260
150	356	306	386	332	422	355	346	292
185	405	348	439	378	478	401	393	331
240	476	409	516	445	551	462	455	382
300	547	469	592	510	616	517	510	428
400	621	540	683	590	693	580	574	490

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 23 (Page 62)
For rating factors of ground temperature other than 15°C, please refer to Table 24 (Page 62)

Table 7 : Voltage Drop (Per Amp Per Meter)
[CU/PVC/PVC/SWA/PVC Cables]

Conductor Operating Temperature : 70°C

IEC 60502-1 (BS 6346)

Conductor Cross-sectional Area	2-core cable, d.c.	2-core cable, 1-phase a.c.	3-core or 4-core cable, 3-phase a.c.			Direct in ground		In single way ducts	
						2-core cable, 1-phase a.c.	3-core or 4-core cable, 3-phase a.c.	2-core cable, 1-phase a.c.	3-core or 4-core cable, 3-phase a.c.
1	2	3	4	5	6	7	8	7	8
mm ²	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m	mV/A/m
1.5	29	29	25	29	25	29	25	29	25
2.5	18	18	15	18	15	18	15	18	15
4	11	11	9.5	11	9.5	11	9.5	11	9.5
6	7.3	7.3	6.4	7.4	6.4	7.4	6.4	7.4	6.4
10	4.4	4.4	3.8	4.4	3.8	4.4	3.8	4.4	3.8
16	2.8	2.8	2.4	2.8	2.4	2.8	2.4	2.8	2.4
		r	x	z	r	x	z		
25	1.75	1.75	0.17	1.75	1.5	0.145	1.5	1.7	1.5
35	1.25	1.25	0.165	1.25	1.1	0.145	1.1	1.3	1.1
50	0.93	0.93	0.165	0.94	0.8	0.14	0.81	0.94	0.82
70	0.63	0.63	0.16	0.65	0.55	0.14	0.57	0.66	0.57
95	0.46	0.47	0.155	0.5	0.41	0.135	0.43	0.49	0.42
120	0.36	0.38	0.155	0.41	0.33	0.135	0.35	0.4	0.35
150	0.29	0.30	0.155	0.34	0.26	0.13	0.29	0.34	0.29
185	0.23	0.25	0.15	0.29	0.21	0.13	0.25	0.29	0.25
240	0.18	0.19	0.15	0.24	0.165	0.13	0.21	0.24	0.21
300	0.145	0.155	0.145	0.21	0.135	0.13	0.185	0.21	0.18
400	0.105	0.115	0.145	0.185	0.1	0.125	0.16	0.19	0.17

Note : r = resistive component; x = reactive component; z = impedance value

Table 23 : Correction Factor for Ambient Air Temperature Other Than 30°C to be Applied to the Current-Carrying Capacities for Cables in Free Air

Ambient Temperature (°C)	Insulation				
	PVC (70°C)	XLPE (90°C)	HT-PVC (90°C)	Rubber (85°C)	Rubber (60°C)
10	1.22	1.15	-	-	-
15	1.17	1.12	-	-	-
20	1.12	1.08	-	-	-
25	1.06	1.04	1.03	1.02	-
30	1.00	1.00	1.00	1.00	1.00
35	0.94	0.96	0.97	0.95	0.91
40	0.87	0.91	0.94	0.90	0.82
45	0.79	0.87	0.91	0.85	0.71
50	0.71	0.82	0.87	0.80	0.58
55	0.61	0.76	0.84	0.74	0.41
60	0.50	0.71	0.80	0.67	-
65	0.35	0.65	0.76	0.60	-
70	-	0.58	0.71	0.52	-
75	-	0.50	0.61	0.43	-
80	-	0.41	0.50	0.30	-
85	-	0.29	0.35	-	-

Table 24 : Correction Factor for Ambient Ground Temperature Other Than 15°C to be Applied to the Current-Carrying Capacities for Cables in Ducts or in Ground

Ground Temperature (°C)	Insulation	
	PVC (70°C)	XLPE (90°C)
10	1.04	1.03
15	1.00	1.00
20	0.95	0.97
25	0.90	0.93
30	0.85	0.89
35	0.80	0.86
40	0.74	0.82
45	0.67	0.77
50	0.60	0.73
55	-	0.68
60	-	0.63
65	-	0.58

Table 25 : Correction Factors for Ambient Temperature & Group Installation

Correction for groups of more than one circuit of single-core cables, or more than one multi-core cable

Reference Methods of Installation		Correction Factor (Cg)													
		Number of Circuits or Multi-Core Cables													
		2	3	4	5	6	7	8	9	10	12	14	16	18	20
Enclosed (Method 3 or 4) or bunched and clipped to a non-metallic surface (Method 1)		0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.48	0.45	0.43	0.41	0.39	0.38
Single layer clipped to a non-metallic surface (Method 1)	Touching	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.70	-	-	-	-	-	-
	Spaced*	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Single layer multi-core on a perforated metal cable tray (Method 11)	Touching	0.86	0.81	0.77	0.75	0.74	0.73	0.73	0.72	0.71	0.70	-	-	-	-
	Spaced*	0.91	0.89	0.88	0.87	0.87	-	-	-	-	-	-	-	-	-
Single layer single-core on a perforated metal cable tray, touching (Method 11)	Horizontal	0.90	0.85	-	-	-	-	-	-	-	-	-	-	-	-
	Vertical	0.85	-	-	-	-	-	-	-	-	-	-	-	-	-
Single layer multi-core touching on ladder supports		0.86	0.82	0.80	0.79	0.78	0.78	0.78	0.77	-	-	-	-	-	-

* Space means a clearance between adjacent surfaces of at least one cable Diam. (D_e). Where the horizontal clearance between adjacent cables exceeds 2 D_e, no correction factor need be applied

Note : 1 The factors in the table are applicable to a group of cables all of the same sizes. The value of the current derived from application of the appropriate factors is the maximum continuous current to be carried by any of the cables in the group.

2 If, due to known operating conditions, a cable is expected to carry not more than 30% of its grouped rating, it may be ignored for the purpose of obtaining the rating factor for the rest of the group.

For example, a group of N loaded cables would normally require a group reduction factor of C_g applied to the tabulated I_t. However, if M cables in the group carry loads which are not greater than 0.3C_g I_t amperes, the other cables can be sized by using the group rating factor corresponding to (N-M) cables.

Table 26 : Correction Factor for Cables with More Than 4 Loaded Cores

No. of Loaded Cores	5	6	7	10	12	14	19
Correction Factor	0.72	0.67	0.63	0.56	0.53	0.51	0.45
No. of Loaded Cores	24	27	30	37	44	46	48
Correction Factor	0.42	0.40	0.39	0.36	0.34	0.33	0.33

- Note:
- The current-carrying capacity for a cable in the size range 1.5 to 4mm², having more than 4 loaded cores, is obtained by multiplying the current-carrying capacity of a 2-core, having the same installation type, by the factor selected from this table. The current-carrying for the 2-core cable is that for the installation condition to be used for the multi-core cable.
 - If due to known operating conditions, a core is expected to carry not more than 30% of its current-carrying capacity in the multi-core cable, it may be ignored for the purpose of obtaining the correction factor for the number of loaded cores.
 - If due to known operating conditions, a core is expected to carry not more than 30% of its rating, after applying the correction factor for the total number of current-carrying cores, it may be ignored for the purpose of obtaining the correction factor for the number of loaded cores.

For example, the current-carrying capacity of a cable having N loaded cores would normally be obtained by multiplying the current-carrying capacity of a 2-core, having the same insulation type, by the factor selected from this table for N cores. That is $I_{z1c} = I_{z2c} \times C_{gN}$ where:

I_{z1c} is the current-carrying capacity for the multi-core cable after applying the correction factor for the total number of current-carrying cores.

I_{z2c} is the tabulated current-carrying capacity of a 2-core cable, having the same insulation type as the multi-core cable.

C_{gN} is the correction factor from Table 26 for the total number of current-carrying cores.

However, if M cores in the cable carry loads which are not greater than $0.3 \times I_{z2c} \times C_{gN}$, the current-carrying capacity can be obtained by using the correction factor corresponding to (N-M) cores.

The 'not greater than $0.3 \times I_{z2c} \times C_{gN}$ ' calculation should be applied before the adjacent multi-core cable grouping factor, if applicable, from Table 23 from BS 7671. The 30% rule should not be further applied to any adjacent cable grouping factor calculations.

I_{z1c} should be greater than or equal to I_n or I_b as appropriate, divided by the relevant correction factor(s) C, that is $I_{z1c} \geq I_n$ or I_b / C