



Flexitime!

Our flexible cables save you time and money.



A brand of the

Prysmian
Group

We're flexible so you won't have to be.

With our improved range of flexible cables we've brought flexibility to a completely new level. From now on it'll be a lot easier to get into those tight corners with less equipment, less people and in half the time*. With a 50% decrease in installation time, imagine what you could do with those savings ...

Australian made? Yes, of course.

Prysmian offers a comprehensive range of flexible cable solutions with Class 5 conductors for fixed installations. With Flexible XLPE and Fire Performance cables, Prysmian has a full suite of cables for the entire Construction market.

Cost savings through flexibility

Our cables ...

- Are easy to handle and install
- Are easy to bend and are less stiff
- Require no bending tools
- Require fewer people to install

Meaning electrical contractors are now able to work in tight spaces and complete their projects faster – resulting in significant savings through time and labour costs.

Superior cable management

- Product availability
- Shorter lead times
- Cables can be cut to length
- Reactive local support

Long-life performance

- Australian designed and made
- Cables made from premium components
- Superior performance

Safety – performance that ensures peace of mind

- High flexibility ensures easier handling – reducing the risk of work place injury and fatigue
- Firestop cables exceed the fire & mechanical performance requirements in AS/NZS 3013

Quality – superior manufacturing and support

- Independently certified by a NATA accredited facility
- Exceeds Australian Standards
- Expert quality control
- Quality technical after-sales support and service



*Dependant on job type and in comparison with rigid cables.

All sizes and values without tolerances are reference values. Specifications are for product as supplied by Prysmian Group: any modification or alteration afterwards of product may give different result. The information contained within this document must not be copied, reprinted or reproduced in any form, either wholly or in part, without the written consent of Prysmian Group. The information is believed to be correct at the time of issue. Prysmian Group reserves the right to amend this specification without prior notice. This specification is not contractually valid unless specifically authorised by Prysmian Group.



Flexible Single Core Cables

For mains, submains and subcircuits unenclosed, enclosed in conduit, buried or in underground ducts for building and industrial plants where not subject to mechanical damage. Suitable where space is at a premium and/or where conditions of overload may occur. Green star accredited.

Single core cables

Flexible 90 °C XLPE

- XLPE/PVC (SDI) X-90 Orange 0.6/1kV

Flexible 110 °C

- R-E-110 (SDI) 110 °C Black 0.6/1kV

Flexible 90 °C PVC Earth

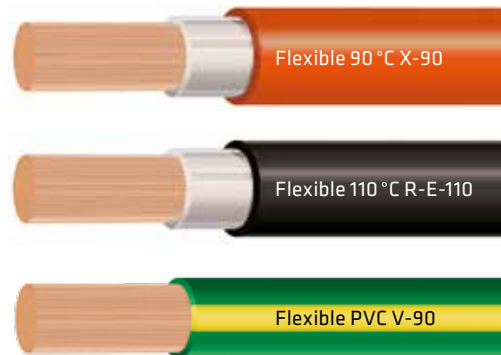
- PVC V-90 Green/Yellow 0.6/1kV

Applicable standards

AS/NZS 5000.1

Product range

Available in the conductor range 10 to 630 mm²,
95 to 630 mm² products available from stock.
Earths available in the range 10 to 630 mm²,
120 to 630 mm² available from stock.



Flexible Firestop

Firestop is easy to install fire safety cable range fully complying with the latest Australian standard AS/NZS 3013 and Building Code of Australia requirements. This range is designed to save lives and help protect property in the event of a fire.

Single core cables

Flexible 110 °C Firestop FS110

- HFS-110 TP Red 0.6/1kV
- Fire performance – AS/NZS 3013 WS52W compliant

Applicable standards

AS/NZS 3013

Product range

Available in the conductor range 10 to 630 mm²,
95 to 630 mm² products available from stock.



WS52W requires the cable to maintain circuit integrity when tested for two hours in a furnace attaining a maximum temperature of 1050 °C, followed by a three minute water spray. The cable is also classified as having moderate mechanical resistance.

FLEXIBLE CABLES 0.6/1 kV

XLPE/PVC (SDI) X-90



Application

Flexible single core X-90 XLPE insulated and PVC sheathed cable for mains, submains and subcircuits unenclosed, enclosed in conduit, buried or in underground ducts for building and industrial plants where not subject to mechanical damage. Suitable where space is at a premium and/or where conditions of overload may occur

Approvals

Suitable for fixed applications only in accordance with AS/NZS 3000 + AS/NZS 5000.1

Behaviour in flame and fire:

Flame propagation - AS/NZS 1660.5.6

Temperature range

Maximum operating temperature: +90°C

Minimum operating temperature: -25°C

Minimum bending radius

Installed cables: 4D

During installation: 6D

Resistance to

Chemical exposure: Occasional

Mechanical impact: Light

Water exposure: Occasional condensation

Solar radiation and

weather exposure: Occasional

Cable design

Conductor:

Flexible bunched annealed copper conductor to AS/NZS 1125 (Class 5).

Insulation:

X-90 XLPE (Flexible XLPE)

Colour: Natural

Sheath:

5V-90 PVC

Colour: Orange

Installation conditions

In free air

In conduit

In trench

In ground with protection

In duct














FLEXIBLE CABLES 0.6/1 kV - XLPE/PVC (SDI) X-90

Physical & electrical characteristics

For fixed installation

Product code	Conductor		Nominal insulation thickness mm	Cable		Approx. mass kg/100 m	Min. installed bending radius mm
	Nominal C.S.A. mm ²	Nominal diameter mm		Overall diameter			
				Minimum mm	Maximum mm		
351CFF90	35	7.7	0.9	11.9	12.7	38.7	55
501CFF90	50	9.3	1.0	13.7	14.5	53.5	60
701CFF90	70	11.1	1.0	15.7	16.5	72.9	70
951CFF90	95	12.8	1.1	17.5	18.4	94.3	75
1201CFF90	120	14.5	1.2	19.4	20.3	118.6	85
1501CFF90	150	16.3	1.4	21.7	22.7	147.4	95
1851CFF90	185	18.0	1.6	23.8	24.8	178.0	100
2401CFF90	240	20.8	1.7	26.9	28.0	231.8	115
3001CFF90	300	23.4	1.8	29.8	30.9	288.3	125
4001CFF90	400	26.8	2.0	33.8	35.0	376.2	145
5001CFF90	500	30.3	2.2	37.8	39.1	474.5	160
6301CFF90	630	35.1	2.4	43.2	44.6	628.9	180

Current ratings

Nominal conductor area mm ²	Unenclosed				Enclosed Wiring enclosure in air	Thermal insulation		Buried direct	Underground wiring enclosure			Three phase voltage drop (@ 50Hz & 90 °C) mV/A.m	
	Spaced	Spaced from surface	Touching	Exposed to sun		Partially surrounded by thermal insulation	Completely surrounded by thermal insulation						
													
35	177	151	141	103	118	96	72	180	134	158	1.24	1.24	
50	223	191	178	128	144	114	-	214	163	190	0.869	0.875	
70	283	241	225	161	183	146	-	262	203	232	0.622	0.630	
95	341	290	271	192	214	176	-	313	237	276	0.483	0.492	
120	406	346	322	226	256	209	-	356	279	320	0.388	0.399	
150	470	400	372	260	291	236	-	400	316	358	0.325	0.338	
185	540	459	427	296	334	268	-	452	357	413	0.280	0.295	
240	651	553	514	352	391	320	-	523	416	477	0.233	0.251	
300	752	637	591	402	458	375	-	589	479	552	0.207	0.227	
400	909	764	709	477	533	427	-	668	554	626	0.183	0.204	
500	1062	884	821	546	630	506	-	752	642	707	0.169	0.192	
630	1256	1030	956	630	719	571	-	843	729	820	0.157	0.181	

Note: Refer to Cable Selection in Technical Cable Guide for more information and data based on AS/NZS 3008.1.1.

FLEXIBLE CABLES 0.6/1 kV

R-E-110 (SDI) 110°C



Application

Flexible single core R-E-110 insulated and HFS-110-TP sheathed cable for mains, submains and subcircuits unenclosed, enclosed in conduit, buried or in underground ducts for building and industrial plants where not subject to mechanical damage. Suitable where space is at a premium and/or where conditions of overload may occur.

Approvals

Suitable for fixed applications only in accordance with AS/NZS 3000 + AS/NZS 5000.1

Behaviour in flame and fire:

Flame propagation - AS/NZS 1660.5.6

Temperature range

Maximum operating temperature: +110°C

Minimum operating temperature: -25°C

Minimum bending radius

Installed cables: 4D

During installation: 6D

Resistance to

Chemical exposure: Occasional

Mechanical impact: Light

Water exposure: Occasional condensation

Solar radiation and

weather exposure: Occasional

Cable design

Conductor:

Flexible bunched annealed copper conductor to AS/NZS 1125 (Class 5).

Insulation:

R-E-110

Colour: Natural

Sheath:

HFS-110-TP

Colour: Black

Installation conditions

In free air

In conduit

In trench














In ground with protection

In duct

FLEXIBLE CABLES 0.6/1 kV - R-E-110 (SDI) 110°C

Physical & electrical characteristics

For fixed installation							
Product code	Conductor		Nominal insulation thickness mm	Cable		Approx. mass kg/100 m	Min. installed bending radius mm
	Nominal C.S.A. mm ²	Nominal diameter mm		Overall diameter			
				Minimum mm	Maximum mm		
351CFF110	35	7.7	1.2	12.5	13.3	40.3	55
501CFF110	50	9.3	1.4	14.5	15.3	55.9	65
701CFF110	70	11.1	1.4	16.3	17.2	75.0	70
951CFF110	95	12.8	1.6	18.5	19.4	97.9	80
1201CFF110	120	14.5	1.6	20.2	21.1	122.0	85
1501CFF110	150	16.3	1.8	22.5	23.6	151.1	95
1851CFF110	185	18.0	2.0	24.8	25.8	183.1	105
2401CFF110	240	20.8	2.2	28.1	29.2	239.0	120
3001CFF110	300	23.4	2.4	31.2	32.4	296.7	130
4001CFF110	400	26.8	2.6	35.1	36.4	386.0	150
5001CFF110	500	30.3	2.8	39.1	40.5	485.2	165
6301CFF110	630	35.1	2.8	44.0	45.5	637.0	185

Current ratings													
Nominal conductor area mm ²	Unenclosed				Enclosed	Thermal insulation		Buried direct	Underground wiring enclosure			Three phase voltage drop (@ 50Hz & 110 °C) mV/A.m	
	Spaced	Spaced from surface	Touching	Exposed to sun	Wiring enclosure in air	Partially surrounded by thermal insulation	Completely surrounded by thermal insulation						
													
35	214	184	172	143	148	121	88	201	151	176	1.31	1.31	
50	270	233	217	179	190	146	-	237	188	212	0.921	0.926	
70	340	292	273	224	234	187	-	291	229	259	0.658	0.665	
95	410	353	329	269	277	228	-	348	268	315	0.509	0.518	
120	487	418	390	317	331	269	-	396	316	357	0.408	0.419	
150	562	482	450	365	378	306	-	445	357	400	0.340	0.353	
185	644	553	516	417	438	359	-	503	404	461	0.293	0.307	
240	775	665	620	499	538	439	-	583	481	533	0.242	0.259	
300	895	766	714	572	612	501	-	657	542	617	0.213	0.232	
400	1079	918	855	682	757	575	-	746	648	700	0.187	0.208	
500	1260	1064	990	786	864	692	-	843	729	815	0.172	0.194	
630	1493	1240	1154	913	993	787	-	947	828	920	0.159	0.182	

Note: Refer to Cable Selection in Technical Cable Guide for more information and data based on AS/NZS 3008.1.1.

FLEXIBLE PVC EARTH CABLES 0.6 / 1 kV

1C FLEXIBLE PVC GREEN/YELLOW V-90



Cable description

Flexible PVC insulated only earth cable to AS/NZS 5000.1

Application

For use as protective earth in electrical installations. For use where improved aging properties to those of 75°C PVC are required because of higher ambient temperatures. Suitable for glanding.

Approvals

Suitable for fixed applications only in accordance with AS/NZS 3000 + AS/NZS 5000.1

Behaviour in flame and fire:

Flame propagation = AS/NZS 1660.5.6

Temperature range

Maximum operating temperature: +90°C
Minimum operating temperature: 0 °C

Minimum bending radius

Installed cables: 4D
During installation: 6D

Resistance to

Chemical exposure: Occasional
Mechanical impact: Light
Water exposure: Occasional condensation
Solar radiation and
weather exposure: Occasional

Cable design

Conductor:

Flexible bunched annealed copper conductor to AS/NZS 1125 (Class 5)

Insulation:

V-90 PVC

Colour: Green/yellow

Installation conditions

Industrial equipment
In conduit
Machines
Internal wiring

FLEXIBLE PVC EARTH CABLES 0.6 / 1 kV – 1C FLEXIBLE PVC G/Y V-90

Physical & electrical characteristics

For fixed installation

Product code	Conductor		Cable				Min. installed bending radius mm
	Nominal C.S.A. mm ²	Nominal diameter mm	Nominal insulation thickness mm	Overall diameter		Approx. mass kg/100 m	
				Minimum mm	Maximum mm		
1.0FFEW	1.0	1.3	0.8	2.9	3.0	1.6	12
1.5FFEW	1.5	1.5	0.8	3.1	3.2	2.0	13
2.5FFEW	2.5	2.0	0.8	3.6	3.7	3.0	15
4FFEW	4	2.7	1.0	4.6	4.7	5.4	19
6FFEW	6	3.5	1.0	5.4	5.6	8.0	22
10FFEW	10	4.2	1.0	6.1	6.3	11	25
16FFEW	16	5.3	1.0	7.2	7.4	16	30
25FFEW	25	6.7	1.2	8.9	9.1	25	40
35FFEW	35	7.9	1.2	10.1	10.3	34	45
50FFEW	50	9.5	1.4	12.1	12.3	49	50
70FFEW	70	11.3	1.4	13.9	14.2	67	60
95FFEW	95	13.0	1.6	16.0	16.2	89	65
120FFEW	120	14.7	1.6	17.6	17.9	112	75
150FFEW	150	16.5	1.8	19.8	20.2	140	85
185FFEW	185	18.2	2.0	21.9	22.2	170	90

Electrical characteristics

Conductor nominal C.S.A. mm ²	Maximum D.C. resistance at 20°C Ω/km	Reactance per core (Trefoil, Touching) Ω/km
1.0	19.5	0.116
1.5	13.3	0.109
2.5	7.98	0.101
4	4.95	0.100
6	3.30	0.0954
10	1.91	0.0876
16	1.21	0.0835
25	0.780	0.0829
35	0.554	0.0801
50	0.386	0.0799
70	0.272	0.0773
95	0.206	0.0771
120	0.161	0.0753
150	0.129	0.0755
185	0.106	0.0754

FLEXIBLE CABLES 0.6/1 kV

FIRESTOP FS110



Application

Flexible single core cable. Power supply to essential circuits such as mains, sub mains and other areas where circuit integrity is essential in the event of a fire.

- Classified (WS52W) meaning the scope of testing is designed to confirm performance when installed in a wiring system.
- Circuit integrity up to an extreme temperature of 1050°C at the end of 2 hours.
- LSZH - Suitable for confined and high people density areas such as airports and other public buildings.

Approvals

Suitable for fixed applications only in accordance with AS/NZS 3000 + AS/NZS 5000.1. Certification to AS/NZS 3013 by a NATA accredited facility.

Behaviour in flame and fire:

Fire performance rating WS52W - AS/NZS 3013
Flame propagation - AS/NZS 1660.5.6
Halogen free/Low smoke emission - AS/NZS 4507

Temperature range

Maximum operating temperature: +110°C
Minimum operating temperature: -25°C

Minimum bending radius

Installed cables: 8D
During installation: 12D

Resistance to

Chemical exposure: Occasional
Mechanical impact: Moderate
Water exposure: Spray
Solar radiation and weather exposure: Occasional

Cable design

Conductor:
Flexible bunched plain annealed copper (Class 5).
Insulation:
Mica glass tape fire barrier, XHF-110
Colour: Natural
Sheath:
HFS-110-TP
Colour: Red

Installation conditions

In free air
In duct
Internal wiring
External building

FLEXIBLE CABLES 0.6/1 kV – FIRESTOP FS110

Physical & electrical characteristics

For fixed installation

Product code	Nominal C.S.A. mm ²	Nominal Cable O.D.	Approx. mass kg/100 m	Minimum installed bending radius mm	AS/NZS 3013 WS rating
251CFFFS110	25	14.1	35.1	115	WS52W
351CFFFS110	35	14.9	44.6	120	WS52W
501CFFFS110	50	16.5	59.7	135	WS52W
701CFFFS110	70	18.2	79.1	150	WS52W
951CFFFS110	95	20.2	101.0	165	WS52W
1201CFFFS110	120	21.9	126.0	180	WS52W
1501CFFFS110	150	24.2	155.0	195	WS52W
1851CFFFS110	185	26.2	186.0	210	WS52W
2401CFFFS110	240	29.4	241.0	240	WS52W
3001CFFFS110	300	32.4	298.0	260	WS52W
4001CFFFS110	400	36.4	388.0	295	WS52W
5001CFFFS110	500	40.5	496.0	325	WS52W
6301CFFFS110	630	46.0	655.0	370	WS52W

Cable selection – For fixed installation

Nominal C.S.A. mm ²	Resistance Ω/km		Reactance at 50Hz trefoil Ω/km	Voltage drop three phase mV/A.m	
	D.C. at 20°C	A.C. at 110°C		Lay flat touching	Trefoil touching
25	0.780	1.06	0.0973	1.85	1.84
35	0.554	0.750	0.0930	1.31	1.31
50	0.386	0.523	0.0901	0.926	0.921
70	0.272	0.369	0.0869	0.665	0.658
95	0.206	0.280	0.0849	0.518	0.509
120	0.161	0.219	0.0828	0.419	0.408
150	0.129	0.176	0.0830	0.353	0.340
185	0.106	0.145	0.0821	0.307	0.293
240	0.0801	0.111	0.0808	0.259	0.242
300	0.0641	0.0898	0.0800	0.232	0.213
400	0.0486	0.0699	0.0788	0.208	0.187
500	0.0384	0.0571	0.0780	0.194	0.172
630	0.0287	0.0489	0.0777	0.182	0.159

FLEXIBLE CABLES 0.6/1 kV – FIRESTOP FS110

Physical & electrical characteristics

Current carrying capacity (a)							
Nominal C.S.A. mm ²	Unenclosed			Enclosed metallic wiring enclosure in air A	Underground ducts		
	Spaced A	Spaced from surface A	Touching A		One duct A	Two duct A	Three duct A
Two (2) Single Core Firestop Flexible Cables FS110							
25	178	170	139	133	143	163	-
35	221	210	172	167	176	195	-
50	279	263	218	207	215	236	-
70	351	329	273	263	266	288	-
95	422	395	329	312	312	352	-
120	500	466	390	364	359	400	-
150	577	536	450	426	414	448	-
185	660	611	516	481	464	517	-
240	794	732	621	583	548	600	-
300	916	841	716	-	631	694	-
400	1105	1006	860	-	734	790	-
500	1290	1164	999	-	855	921	-
630	1529	1359	1168	-	977	1045	-
Three (3) Single Core Firestop Flexible Cables FS110							
25	173	149	139	121	125	-	148
35	214	184	172	148	151	-	176
50	270	233	217	190	188	-	212
70	340	292	273	234	229	-	259
95	410	353	329	277	268	-	315
120	487	418	390	331	316	-	357
150	562	482	450	378	357	-	400
185	644	553	516	438	404	-	461
240	775	665	620	538	481	-	533
300	895	766	714	612	542	-	617
400	1079	918	855	757	648	-	700
500	1260	1064	990	864	729	-	815
630	1493	1240	1154	993	828	-	920

(a) Based on 90°C conductor temperature, 40°C ambient air temperature and where applicable, burial depth of 0.5m, soil temperature of 25°C and soil thermal resistivity of 1.2°C.m/W. Refer to AS/NZS 3008.1 for other installation conditions.



Only the best for True Blue Aussies.

Australian made quality cables.



We've been producing tailor-made cables in Australia since 1944. And we will continue to do so. Our great staff of highly skilled and experienced people know what it takes to make cables that withstand everything from termites to hazardous mine sites. Just fair dinkum cables, mate.

Australian made? Yes, of course.

A brand of the
Prysmian
Group

FLEXIBLE CABLES 0.6/1 kV

Technical information

Voltage drop										
Conductor size mm ²	Three phase voltage drop (Vc) at 50hz, mV/A.m									
	Conductor temperature °C									
	45		60		75		90		110	
	Max.	0.8 p.f.	Max.	0.8 p.f.	Max.	0.8 p.f.	Max.	0.8 p.f.	Max.	0.8 p.f.
0.5	74.2	-	78.2	-	82.2	-	86.1	-	91.4	-
0.75	49.5	-	52.1	-	54.8	-	57.4	-	61.0	-
1	37.1	-	39.1	-	41.1	-	43.1	-	45.7	-
1.5	25.3	-	26.7	-	28.0	-	29.4	-	31.2	-
2.5	15.2	-	16.0	-	16.8	-	17.6	-	18.7	-
4	9.42	-	9.92	-	10.4	-	10.9	-	11.6	-
6	6.28	-	6.62	-	6.95	-	7.29	-	7.74	-
10	3.64	-	3.83	-	4.03	-	4.22	-	4.48	-
16	2.31	-	2.43	-	2.56	-	2.68	-	2.84	-
25	1.50	-	1.57	-	1.65	-	1.73	-	1.84	-
35	1.07	-	1.12	-	1.18	-	1.24	-	1.31	-
50	0.754	-	0.792	-	0.831	-	0.869	-	0.921	-
70	0.543	-	0.569	-	0.596	-	0.622	-	0.658	-
95	0.425	-	0.443	-	0.463	-	0.483	-	0.509	-
120	0.344	-	0.358	-	0.373	-	0.388	-	0.408	-
150	0.291	-	0.302	-	0.313	-	0.325	-	0.340	-
185	0.254	-	0.263	-	0.272	-	0.280	-	0.293	-
240	0.215	0.214	0.221	0.221	0.227	0.227	0.233	0.233	0.242	0.242
300	0.194	0.190	1.098	0.195	0.203	0.200	0.207	0.205	0.213	0.212
400	0.175	0.166	0.178	0.170	0.180	0.174	0.183	0.178	0.187	0.183
500	0.164	0.151	0.165	0.154	0.167	0.157	0.169	0.160	0.172	0.164
630	0.154	0.137	0.155	0.139	0.156	0.141	0.157	0.143	0.159	0.146

Note: These Vc values apply to a balanced three phase circuit in which no current flows in the neutral conductor.
 To determine the single phase Vc the current in the neutral conductor needs to be considered by multiplying the three phase value $\frac{2}{\sqrt{3}} = 1.155$.
 Ref: AS/NZS 3008.11

FLEXIBLE CABLES 0.6/1 kV

Technical information

Cable selection – Safe working force

Cables subjected to straight tension without significant bending or flexing - Safety factor 4:1					
Nominal conductor area mm ²	Single core kN	Two core kN	Three core kN	Four core kN	More than four cores kN
0.5	0.015	0.030	0.045	0.060	0.015 x N
0.75	0.023	0.045	0.068	0.090	0.023 x N
1.0	0.030	0.060	0.090	0.12	0.030 x N
1.5	0.045	0.090	0.14	0.18	0.045 x N
2.5	0.075	0.15	0.23	0.30	0.075 x N
4	0.12	0.24	0.36	0.48	0.12 x N
6	0.18	0.36	0.54	0.72	0.18 x N
10	0.30	0.60	0.90	1.2	0.30 x N
16	0.48	0.96	1.4	1.9	0.48 x N
25	0.75	1.5	2.3	3.0	0.75 x N
35	1.1	2.1	3.2	4.2	1.1 x N
50	1.5	3.0	4.5	6.0	1.5 x N
70	2.1	4.2	6.3	8.4	2.1 x N
95	2.9	5.7	8.6	11	2.9 x N
120	3.6	7.2	11	14	3.6 x N
150	4.5	9	14	18	4.5 x N
185	5.6	11	17	22	-
240	7.2	14	22	-	-
300	9	18	-	-	-

*Where N equals the number of cores of the same size.

Cable Selection – 3-phase formulae

Desired data	Single phase	Three phase
When kVA is known	$\frac{kVA * 1000}{E_o}$	$\frac{kVA * 1000}{\sqrt{3} * E}$
When kW is known	$\frac{kW * 1000}{(E_o * pf)}$	$\frac{kW * 1000}{\sqrt{3} * E * pf}$
When hp is known	$\frac{hp * 746}{(E_o * pf)}$	$\frac{hp * 746}{\sqrt{3} * E * pf}$
kVA	$\frac{I * E_o}{1000}$	$\frac{I * E * \sqrt{3}}{1000}$
kW	$\frac{I * E_o * pf}{1000}$	$\frac{I * E * \sqrt{3} * pf}{1000}$
hp	$\frac{I * E_o * pf}{746}$	$\frac{I * E * \sqrt{3} * pf}{746}$

Table lists formulae commonly used for determining various parameters of an electrical system.

Where:

- E_o = Single phase voltage, in volts. E.g. 240V
- E = Three phase line voltage, in volts. E.g. 415V (E = √3 x E_o)
- I = Current in amperes
- %Eff = Percent efficiency in decimals (varies from 85 % for small motors to 90 % and over in large motors)
- pf = Power factor in decimals
- kVA = Kilovolt-ampere
- hp = Horsepower
- kW = Kilowatts
- Power Output = Power Input x %Eff
- √3 = 1.732

General information

Cable selection

The following are some simplified procedures for cable selection. Refer to the Wiring Rules and AS/NZS 3008.1.1 for detailed information.

The four main electrical criteria for cable selection are:

1. Current rating
2. Voltage drop
3. Earth loop impedance
4. Short-circuit capacity

Generally speaking, for:

Short route length, current-carrying capacity requirement will dictate the cable size selection.

Long route length, voltage drop or earth loop impedance requirement will dictate the cable size selection.

The short-circuit capacity of a cable shall be such that all short-circuit current occurring at any point of a circuit shall not cause the cable conductor temperature to exceed the maximum permissible limit.

Current rating

Current rating of a cable depends on:

1. Installation method, e.g., In air or ground, enclosed or unenclosed, etc.
2. Installation environment, e.g., ambient temperature, depth of laying, presence of other cables or circuits nearby, etc.
3. Limiting temperatures of the cables for normal use, e.g., PVC and XLPE insulated cables are 75 °C and 90 °C respectively.
4. Type of overcurrent protective device used, appropriate derating factor:
 - 0.8 for semi-enclosed (rewireable) fuses
 - 0.9 for fuses, e.g. AS 2005 series fuses, with $I_2 = 1.6 \times I_N$
 - No derating is required for circuit breakers, e.g. AS/NZS 4898 circuit breakers, with $I_2 = 1.45 \times I_N$

Where:

I_2 = conventional overcurrent fusing or tripping current.

I_N = nominal current of the fuse or circuit breaker.

Current ratings in this technical manual are extracted from AS/NZS 3008.1.1

Voltage drop

Wiring Rules stipulate a maximum voltage drop of 5% of the nominal voltage between the point of supply and any point in the installation when the conductors are carrying maximum demand.

Voltage drops in this technical manual are based on:

1. Maximum conductor temperatures of 75 °C, 90 °C and 110 °C as indicated.
2. Load power factor to give maximum voltage drop.
3. Single core cables are touching in trefoil or flat formation.
4. Supply frequency of 50Hz.

An Equation to determine minimum required cable size due to voltage drop is:

$$V_c = V_d \times 1000 / I \times L \text{ millivolts/ampere metre}$$

Where:

V_c = Millivolts drop/ampere metre as given in the tables

V_d = Maximum permissible voltage drop in volts

I = Current in Amperes

L = Route length in metres

A Cable can now be selected such that V_c is equal to or less than calculated, and check that it will carry the current

Earth loop impedance and short circuit capacity

When relevant information on calculating these values is required please consult the Prysmian "Technical Cable Guide".

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Glossary of terms

Ambient temperature for current - carrying capacity:	The temperature of the medium in the immediate neighbourhood of the installed cable: 1. including any increase in temperature due to materials or equipment to which the cables are connected, or are to be connected; but 2. excluding any increase in temperature which may be due to the heat arising from the cables at that point.
AS/NZS 1125:	Conductors in insulated electric cables and flexible cords.
AS/NZS 1995:	Welding Cables
AS/NZS 3000:	Australian/New Zealand Wiring Rules
AS/NZS 3008.1.1:	Australian/New Zealand Standard - Electrical installations - Selection of cables Part 1.1: Cables for alternating voltages up to and including 0.6/1kV - Typical Australian installation conditions
AS/NZS 3191:	Electric flexible cords
AS 3147:	Superseded by AS/NZS 5000
AS/NZS 3198:	Superseded by AS/NZS 5000
AS/NZS 5000:	Australian/New Zealand Standard • Electric Cables • Polymeric insulated Part 1: For working voltages up to and including 0.6/1kV Part 2: For working voltages up to and including 450/750V
Bending radius, installed:	Refers to minimum bending radius to which the cable can be subjected to in its final position or location.
Bending radius, installing:	Refers to minimum bending radius to which the cable can be subjected to during the installation process.
Conductor:	That portion of a cable which has specific function of carrying current.
Cu:	Copper conductor, usually refers to plain annealed copper.
Elastomer:	Synthetic Rubber Thermosetting Polymer
LV:	Low voltage: • A.C. = 50V and = 1000V; • D.C. = >120V and =1500V
Overcurrent:	A current exceeding the rated value.
PACW:	Plain annealed copper wire.
PE:	Polyethylene (see thermoplastic material)
Point of Supply:	The junction of the electricity distributor's conductors with the consumers mains (formerly known as consumer terminals).
PVC:	Polyvinyl Chloride
R-EP-90:	A cross-linked compound based on ethylene propylene copolymer or terpolymer, suitable for a maximum continuous operating temperature of 90°C.
Short-circuit current:	A fault current resulting from a fault of negligible impedance between live conductors having a difference in potential under normal operating conditions.
TACW:	Tinned annealed copper wire
TCu:	Tinned copper conductor
Thermoplastic material:	A material that can be readily softened and re softened by repeated heating e.g. PVC and PE.
Thermosetting material:	A material which cures by chemical reaction and when cured, or crosslinked, cannot be melted and reshaped e.g. XLPE.
XLPE:	Cross linked polyethylene. For LV application, usually refers to X-90 grade (see thermosetting material).

Linking the future



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