

Section 9 Technical Tables

	Page
AWG to stranded Conductor Conversion table	9.2
Automotive Amp rating and Voltage Drop	9.3
Cable current ratings Single phase/Three phase	9.4-6
Common Industry Terms	9.7-8

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A.W.G. (B+S)		SOLID WIRE EQUIV.		STRANDED WIRE EQUIVALENTS				No. STRANDS/WIRE DIA. = mm ²					
GAUGE	AREA mm ²	SIZE	mm ²		mm ²		mm ²		mm ²		mm ²		mm ²
26	0.128			7/15	0.124	7/16	0.148						
25	0.162												
24	0.205	0.5	0.20	7/20	0.22	14/14	0.22						
23	0.255												
22	0.322	0.64	0.32	7/25	0.34	7/26	0.37	14/20	0.44				
21	0.411												
20	0.516	0.80	0.50	19/18	0.48	16/20	0.50	10/25	0.49	7/30	0.49	7/32	0.56
19	0.653			30/18	0.76	24/20	0.75	9/30	0.64				
18	0.823			19/24	0.81	16/254	0.85	11/30	0.78	11/32	0.88	7/40	0.88
17	1.039	1.13	1.00	32/20	1.00	16/30	1.13	14/32	1.13	7/43	1.00	56/15	0.99
16	1.308			50/18	1.27	19/29	1.25	16/32	1.28	7/50	1.37	26/254	1.31
15	1.652	1.38	1.50	84/15	1.48	30/25	1.47	26/3	1.84				
14	2.088			64/20	2.00	26/32	2.08	41/254	2.08				
13	2.629	1.78	2.50	140/15	2.48	84/20	2.60	50/25	2.48	41/30	2.90	7/67	2.47
12	3.302			41/32	3.30	65/254	3.29	105/2	3.30				
11	4.156			56/3	3.96	65/3	4.59	7/85	3.97	127/2	4.0		
10	5.271			84/3	5.93	65/32	5.22	7/104	5.90	192/2	6.0		
9	6.629												
8	8.350			112/3	7.9	94/32	7.56	100/32	8.0	172/254	8.7		
7	10.544			322/2	10.1	77/4	9.7	7/135	10.0	322/2	10.0		
6	13.292			192/3	13.6	171/32	13.7						
5	16.755			511/2	16.0	126/4	15.8	7/170	15.9	511/2	16.0		
4	21.137			287/3	20.3	247/32	19.8						
3	26.653			792/2	24.9	364/3	25.7	209/4	26.3	792/2	25.0		
2	33.606			1121/2	35.2	455/3	32.1	1121/2	35				
1	42.384			492/32	39.5								
0	53.454			1596/2	50.2	703/3	49.6	612/32	49.2	1596/2	50		
00	67.399			2212/2	69.5	910/3	64.3	988/3	69.8	2212/2	70		
000	84.905			1204/3	85.1	1332/3	94.1	3021/2	94.9				
0000	104.091			1482/3	104.0	3821/2	120						

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SINGLE CORE Automotive Cable

PVC Insulated 50 volt rated

AMP Rating FREE IN AIR based on JASO D609

Voltage Drop based on AS3008.

Please note: derating factors apply according to these specifications

CONDUCTOR AREA mm ²	TYPICAL STRAND NUMBER/ SIZE (mm)	AMP at 30c	VOLTAGE DROP	
			Chasis Grounded @ 20°C	2 wire System @ 40°C
0.3	7/0.26	10	50	125.00
0.5	7/0.32	13	33	83.00
0.85	11/0.32, 16/0.26, 19/0.24	17	22	55.00
1.13	16/0.3	20	16.5	40.00
1.25	16/0.32, 19/0.29	23	14.5	36.80
1.84	26/0.3	28	10.1	25.00
2.0	26/0.32	31	8.8	23.00
2.9	41/0.3	37	6.4	15.50
3.0	41/0.32	42	5.5	13.50
4.59	65/0.3	48	4.1	10.00
5.0	65/0.32	56	3.5	8.50
8.0	112/0.3, 100/0.32	74	2.4	5.80
13.5	192/0.3, 171/0.32	103	1.4	3.40
20.0	287/0.3, 247/0.32	135	.9	2.30
25.0	364/0.3	168	.7	1.80
30.0	455/0.3, 361/0.32	188	.6	1.40
40.0	492/0.32	210	.5	1.16
50.0	611/0.32	246	.4	0.90
60.0		272		0.76
65.0	910/0.3	292	.3	0.71
85.0	1204/0.3	335	.23	0.54
100.0	1482/0.3	399	.18	0.44

Amp Derating Factors for Bundling of Cables								
No of Cables	1	2	3	4	5	6-7	8-10	11-12
Derating Factor	1.0	0.8	0.7	0.6	0.55	0.5	0.45	0.4

Temperature Derating Factors (Amp)					
Temp ° C	30	40	50	60	70
Derating Factor	1.0	0.9	0.8	0.65	0.45

Current Ratings 0.6/1 KV V75, V90 & V90HT Cables Single Phase Circuits

Two Single Core PVC or PVC PVC Cables

CURRENT CARRYING CAPACITY A - Based on AS3008 Table 8.

Cond Size	Unenclosed		Touching	Buried Direct	Underground Ducts		Single Phase Volt Drop mV/A.m
	Spaced	Space from Surface					
mm2	Cu	Cu	Cu	Cu	Cu	Cu	Cu
1	16	16	13	24	18	21	44.7
1.5	21	21	16	31	24	27	28.6
2.5	30	29	23	43	33	37	15.6
4	40	39	31	56	42	48	9.71
6	51	49	40	71	53	60	6.49
10	69	67	54	94	71	79	3.86
16	92	89	72	120	91	100	2.43
25	125	120	97	160	120	135	1.55
35	155	145	120	190	145	160	1.12
50	185	175	145	225	170	190	0.84
70	240	225	185	275	210	235	0.597
95	295	275	230	330	260	285	0.449
120	345	320	265	380	295	320	0.371

One two Core PVC PVC Cable

CURRENT CARRYING CAPACITY A

Cond Size	Unenclosed		Enclosed Conduit in Air Round Cable	Buried Direct	Underground Ducts	Single Phase Voltage Drop mV/A.m
	Spaced	Touching				
mm2	Cu	Cu	Cu	Cu	Cu	Cu
1	15	14	11	22	17	57.6
1.5	19	18	14	28	22	33.0
2.5	27	26	20	40	31	18.0
4	37	34	26	52	40	11.2
6	46	44	34	65	51	7.50
10	64	60	47	87	68	4.46
16	85	80	63	115	88	2.81
25	115	105	88	145	115	1.78
35	140	130	105	180	140	1.28
50	170	160	125	210	165	0.957

Note: Amperage ratings are those specified in AS 3008.1.
Derating factors may apply in some conditions, refer AS 3008.1 for details.

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Current Ratings 0.6/1 KV V75, V90 & V90HT Cables Three Phase Circuits

Three Single Core PVC or PVC/PVC Cables

CURRENT CARRYING CAPACITY A							
Cond Size	Unenclosed		Enclosed Conduit In Air	Buried Direct	U/Ground Ducts	Three Phase Voltage Drop mV/A.m	
	Spaced from Surface	Touching					
mm2	Cu	Cu	Cu	Cu	Cu	Cu	Cu
1	14	13	11	21	16	44.7	44.7
1.5	17	16	14	27	20	28.6	28.6
2.5	25	23	20	37	28	15.6	15.6
4	33	31	26	49	37	9.71	9.71
6	42	40	34	61	46	6.49	6.49
10	58	54	47	81	61	3.86	3.86
16	77	72	62	105	80	2.43	2.43
25	105	97	87	135	105	1.54	1.55
35	125	120	100	160	125	1.12	1.12
50	155	145	125	190	150	0.834	.84
70	195	185	155	235	185	0.589	0.597
95	245	230	185	280	225	0.439	0.449
120	285	265	220	315	260	0.351	0.371

Three & Four Core PVC/PVC Cables

CURRENT CARRYING CAPACITY A						
Cond. Size	Unenclosed		Enclosed Conduit in Air Round Cable	Buried Direct	U/Ground Ducts	Three Phase Voltage Drop mV/A.m
	Spaced from Surface	Touching				
mm2	Cu	Cu	Cu	Cu	Cu	Cu
1	13	12	10	19	15	44.7
1.5	16	15	13	24	19	28.6
2.5	23	22	18	34	26	15.6
4	31	29	24	44	34	9.71
6	40	37	31	55	43	6.49
10	54	51	42	74	57	3.86
16	72	68	56	96	74	2.43
25	97	91	79	125	96	1.54
35	120	110	92	150	115	1.12
50	145	135	110	180	140	0.829
70	185	170	140	220	175	0.583
95	230	215	165	265	210	0.431
120	265	245	195	300	240	0.351

Note: Amperage ratings are those specified in AS 3008.1.
Derating factors may apply in some conditions, refer AS 3008.1 for details.

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Current Rating Capacity

Two Single-Core 0.6/1kv Sheathed and Unsheathed Non-Armoured Cables with R-E-110 and X-HF-110 Insulation.

Cond Size mm ²	Unenclosed			Enclosed			Buried Direct	Underground Non-metallic wiring enclosure	
	Spaced	Spaced from Surface	Touching	Metallic wiring enclosure in air	In metallic wiring enclosure or unenclosed partially surrounded by thermal insulation	Completely surrounded by thermal insulation			
1	25	24	20	20	16	10	31	24	27
1.5	32	31	25	25	20	13	39	30	34
2.5	45	44	36	35	28	18	55	42	47
4	59	58	47	46	37	23	71	55	61
6	75	73	59	58	46	30	89	68	76
10	105	99	81	78	62	40	120	90	100
16	135	130	105	105	83	53	155	120	130
25	185	175	145	135	110	72	200	150	170
35	225	215	175	165	130	88	240	185	200
50	275	260	215	205	165	-	280	220	240
70	350	330	270	255	205	-	345	270	295
95	435	405	340	320	255	-	415	330	360
120	510	470	395	370	295	-	475	375	410

Three Single-Core 0.6/1kv Sheathed and Unsheathed Non-Armoured Cables with R-E-110 and X-HF-110 Insulation.

1	24	21	20	17	14	10	27	21	25
1.5	31	27	25	22	18	13	34	26	31
2.5	43	38	36	32	25	18	47	37	43
4	57	50	47	41	33	23	61	47	55
6	73	63	59	51	41	30	76	59	69
10	99	86	81	71	57	40	100	79	90
16	130	115	105	93	74	53	130	100	120
25	175	155	145	125	100	72	170	135	150
35	220	190	175	150	120	88	200	160	180
50	265	230	215	180	145	-	235	190	215
70	340	290	270	235	185	-	290	235	265
95	420	365	340	285	230	-	350	285	320
120	490	420	395	335	270	-	395	330	365

Common Industry Terminology

Aerial Cable	A conductor or cable suspended under tension between support structures. Conductor is hard drawn.
Attenuation (Loss)	The decrease in magnitude of a wave or signal as it travels through a transmitting medium such as cable. Useful measure of signal loss in coaxial and LAN cables. Generally expressed in decibels (dB).
Ambient Temperature	The temperature surrounding the cable prior to energising the cable.
Annealed Copper	Copper which is softened by heat treatment to improve its flex life and conductivity.
Air Gap	Air voids are created by the use of a webbed (spoked) insulation construction in coaxial cables to improve the signal retention properties of the cable. (Also see Cellular Insulation.)
Austel	Authority regulating Australia's telecommunications network. Cables connecting to the network must comply with S008 specification, be approved by Austel and carry a certified component listing (CCL).
AWG	American Wire Gauge. A system of sizing wire, equivalent to B&S. The smaller the gauge, the larger the wire.
Balanced Pair	Two identical insulated conductors twisted together having the same but opposite electromagnetic characteristics so that they cancel each other out.
B&S	Brown & Sharpe. A system of wire sizing. (Equivalent to AWG.)
Braid	An interwoven covering used as the second conductor in coaxial cables and as a flexible screen. Braid Coverage: The percentage of surface area covered by the braid.
Capacitance	A measure of the performance of an insulant to protect the integrity of the signal. The lower the capacitance, the more accurate the signal.
Capacitance Unbalance	Difference in capacitance between one circuit or pair and another circuit or pair.
Cellular Insulation	(Foam) Air is introduced into the insulation to reduce the material dielectric. (See Air Gap)
Current Carrying Capacity	The maximum current a conductor can carry without heating the insulation beyond its safe operating limit.
Conductor(s)	Constructed from solid, stranded or flexible wires, a conductor is the physical path along which the signal or electrical energy flows. (a) Solid – Single strand conductor ($1/1.78 = 2.5\text{mm}^2$) (b) Stranded – A number of smaller single strand conductors twisted together to reduce rigidity for the same cross sectional area ($7/0.67 = 2.5\text{mm}^2$) (c) Flexible – A larger number of smaller wires to further increase conductor flexibility ($50/0.25 = 2.5\text{mm}^2$)
Connecting Wire	Low current, low voltage (under 1000V) wire used within electrical equipment.
Core	Generally refers to an insulated conductor which can be a single wire product or grouped to form a multi-core cable.
CSA (a)	Cross Sectional Area of a conductor (end surface area).
CSA (b)	Canadian Standards Association. Operates a listing approvals service for electronic/electrical equipment and materials. Counterpart of Underwriters Laboratories (UL) USA.
Dekoron	Olex proprietary name for their range of instrumentation cables.
Derating Factor	A factor applied to a current rating which takes into account environmental and installation conditions which can effect the performance of the cable (see AS3008.1).
Dielectric Constant	The material characteristic which determines relevant electronic performance, e.g. capacitance.
Drain Wire	An uninsulated tinned copper conductor designed to allow easy termination of an aluminium foil shield in data cables.
Duty Cycle	The percentage of time a cable carries current. Generally relates to welding cables (AS1995). 100% duty cycle is based on a cycle time of one hour, other duty cycles on a five minute cycle.
Duty Rating	AS3191, flexible cords. Light, ordinary and heavy duty (250/250V, 250/440V, 0.6/1KV).
Flame Retardant	The ability of a material to resist combustion. Polyethylene burns freely and will continue to burn when the flame source is removed whereas PVC will self extinguish. PVC can be given enhanced flame retardant properties through the addition of special additives.

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Flex Life	The ability of a cable to resist failure under repeated flexing.
Figure 8	Parallel webbed. Two cables running parallel and joined together by an extruded web.
Filler	Material laid up with cable cores to fill voids between the cores or to circularise the cable for sheathing.
Foam Insulation	See Cellular Foam.
Hook Up	See Connecting Wire
Hygroscopic	(Paper Fillers) Will absorb moisture. Non-Hygroscopic does not (PVC, Polypropylene).
Impedance	The total opposition a circuit, cable or component offers to alternating current. It includes both resistance and reactance and is generally expressed in ohms.
Impedance Match	Where the impedance of the equipment or system is matched to the impedance of the connecting cable, e.g. Radio – 50 ohms, TV/Video – 75 ohms, Computer/Data – 100 ohms.
LSTA	Low smoke toxicity and acid. A range of non halogenated compounds which exhibit enhanced flame retardant properties and liberate minimum smoke, acid and toxic vapors when burnt.
LAN	Local Area Network. A data system providing information transfer over a small geographic area, e.g. a factory site. Other networks are MAN, Metropolitan Area Network, and WAN, Wide Area Networks, which connect national and international communication systems.
Low Loss	See Attenuation
MIL SPEC	US Military Specification. MIL-C-17 is the base construction for RG series coaxial cable.
Minimum Bending Radius	The recommended minimum radius that a cable can be bent around without detrimental effect to the cable.
Multi-Core	A cable with two or more cores, overall sheathed and generally circular in shape.
Nylon Jacket	An abrasion resistant thermoplastic with good chemical resistance. Used as a termite (white ant) barrier.
Patchlead	A flexible UTP cable used for interconnection of circuits on or to a patchboard.
Oxygen Index	A measure of the percentage of oxygen required to support combustion. The higher the OI the more flame retardant. Normal PVC OI = 25, flame retardant = 30 plus.
Polyethylene (PE)	A thermoplastic material with superior electrical characteristics – breakdown voltage and dielectric constant. Poor flame retardance.
Polypropylene	Similar to PE but harder, stiffer and a higher softening point.
Pair	See Balanced Pair.
Resistance	DC resistance is the measurement of opposition to current flow in ohms per unit length and varies with the type of conductor. The larger the conductor area, the lower the resistance.
RG/U	Military designation for coaxial cables (see MIL SPEC).
Shield (screen)	A barrier to prevent signal leakage or interference. Aluminium foil with drain wire, woven copper braid or combination of both. (a) Overall screen – cable is screened overall (b) Individual screen – pairs are individually screened (c) Individual and overall screen – pairs are individually screened, laid up and overall screened
STP	Screened Twisted Pair/s (LAN cables).
Tinned Copper	A protective coating applied to copper, tinning provides a barrier between materials, resists corrosion, improves solderability and contact properties.
UL	Underwriters Laboratories (USA). Operates an internationally recognised approvals listing service for electrical and electronic equipment and materials.
UTP	Unscreened Twisted Pair/s (LAN applications).
UV Stabilised	A compound stabilised against degradation by UV rays.
Velocity of Propagation	The ratio of time for a signal to travel through a transmission line compared to the time taken in air. Varies with insulant type.
Voltage Drop	The decrease in voltage from the point of supply to the point of application. Voltage drop varies with the conductor area, route length, total amp load and supply voltage.
Voltage Rating	The voltage a cable can withstand in constant operation without failure.