Tri-rated Cables

Circuit applications

These cables are designed for the internal wiring of appliances and also the wiring of switch, control, metering and instrument panels of power switchgear.

Construction

Flexible plain copper conductors, heat-resisting PVC insulated only, 600/1000V, meeting the requirements of BS 6231 for type CK, Canadian Standards Association standard CSA (TEW) and Underwriters Laboratories UL-83.
Maximum operating temperature: 105ºC according to CSA and UL.

Identification

Tri-rated cables can be manufactured black, brown, red, orange, yellow, green, blue, violet, white, pink, grey and green/yellow. (Subject to our M.O.Q.)
- and in addition are indented/printed with the following:
General Cable 1 Size AWG (ó MCM)
AWM STYLE (nº style) 105ºC600 V VW-I CSA TEW 105º
CFTI BS 6231 Size mm^2 + BASEC

Range and dimensions

Conductor			UL Style number	Nominal overall diameter *mm*
code Nº	size *mm^2*	size *AWG*		
16.30.103	0.50	22	1015	2.5
16.30.104	0.75	20	1015	2.7
16.30.105	1	18	1015	2.9
16.30.106	1.5	16	1015	3.1
16.30.107	2.5	14	1015	3.5
16.30.108	4	12	1015	4.1
16.30.109	6	10	1015	4.6
16.30.110	10	8	1028	6.4
16.30.111	16	6	1283	8.2
16.30.112	25	4	1283	9.4
16.30.113	35	2	1283	10.5
16.30.114	50	1	1284	12.9
16.30.115	70	2/0	1284	14.8
16.30.116	95	3/0	1284	16.4
16.30.117	120	4/0	1284	18.2

Current ratings

The table below lists the full thermal current ratings which will raise the conductor temperature to 85º C when one cable is installed in free air at an ambient temperature of 45ºC. These ratings are applicable for installations which ensure that the operation of the protective device is not greater than 1.45 times the continuous current carrying capacity of the cable. Where protections is by means of semi-enclosed fuses to BS 3036 the rating must be multiplied by a factor of 0.76.

Conductor Size *mm2*	Resistance at 20ºC *ohm/km*	Current Rating *amp*	Approximate Volt drop Constant *mV/A/m*
0.50	39.0	11	46.0
0.75	26.0	14	31.0
1	19.5	17	22.0
1.5	13.3	21	15.0
2.5	7.98	30	9.1
4	4.95	41	5,7
6	3.30	53	3.8
10	1.91	75	2.2
16	1.21	100	1.4
25	0.780	136	0.89
35	0.554	167	0.64
50	0.386	204	0.45
70	0.272	259	0.32
95	0.206	321	0.24
120	0.161	374	0.19

The voltage drop figures are for one cable only. For other circuit arrangement they should be adjusted as follows:

single phase 50Hz ac or 2-wire de circuits	*x2*
three phase 50Hz ac circuits	*x1.732*

Rating factors

For ambient temperatures other than 45°C the multiplying factors given below should be applied, and similarly where cables are to be grouped together.

Due consideration and allowance should be made for radiated or conducted heat and for restrictions to ventilation in each case.

There may also be additional limitations to the ratings of the smaller sizes for reasons of mechanical strength, short circuit capacity and voltage drop.

These limitations apply particularly to the 0.5mm2 and 0.75mm^2 conductors. Where it is desirable to limit the temperature rise of the cable so as to avoid overheating enclosures, the rating factors below may be applied in order to obtain any given temperature rise, provided that this will not produce a conductor temperature greater than 85°C.

For example, if the conductor temperature rise is to be limited to 15°C, this is subtracted from 85°C to give a fictitious ambient temperature of 70°C. The rating factor corresponding to 70°C (0.63 or 0.83 according to the type of protection) will then give the required temperature rise.

Ambient temperature (°C)	45	50	55	60	65	70	75
Close protection (1.45 x overload protection)	1.00	0.97	0.90	0.82	0.73	0.63	0.52
Fuses to BS 3036	1.00	0.98	0.95	0.92	0.89	0.83	0.68
Number of cables grouped and touching	2	3	4	5	6	7	8
Rating factor	0.80	0.70	0.65	0.60	0.56	0.63	0.50