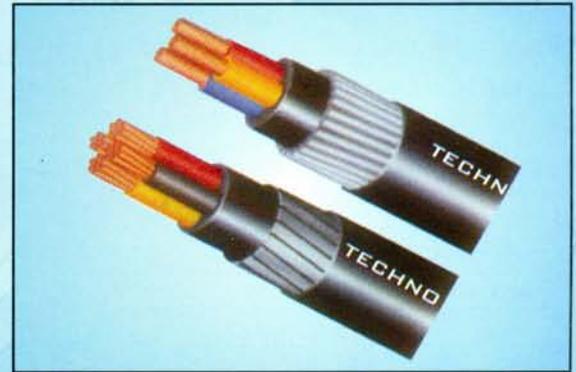


*Techno Flex* manufacture high quality heavy duty power cable confirming to IS : 1554 (Part -1) L.T. 1100 volts grade



Power Cable

**CONSTRUCTION DETAILS :-**

- CONDUCTOR** : Plain bright annealed copper / aluminium, solid / stranded conductor confirming to IS : 8130 : 1984.
- INSULATION** : Type A, B, & C (HR) grade according to IS : 5831 : 1984 amended up dated.
- INNER SHEATH** : Inner sheathing shall done by extrusion or by PVC tape binding that laid up cores shall not loose and prevent to water entering.
- ARMOUR** : GI armour wire / strip provides not only mechanical support but also earthing. The material use an according to IS : 3975 : 1974 amended up dated.  
For single core cable non magnetic material is used that to reduce magnetic losses.
- OUTER SHEATH** : Extruded ST1 / ST2(HR, FRLS, Halogenfree FRLS) type PVC is used according to IS : 5831 : 1984.
- APPLICATION** : In Thermal Power Station; Petrochemical Refineries; Steel & Cement Plant; Distribution System; Digital Control and Monitoring & Information systems; Air Ports; Building Towers; etc.

*Techno Flex* manufacture heavy duty Power Cable comprising of cores Single / Two / Three / Three & Half / Four Of **Copper / Aluminium Conductor**, PVC Insulated cores laid up, PVC Inner Sheathed OR PVC tape binding, GI wire / Strip Armoured & overall PVC sheathed cable confirming to **IS : 1554 : Part-1**.

**POWER CABLE - TWO CORE**

Nominal Cross sectional Area in mm <sup>2</sup> & Cores	Nominal Insulation Thickness mm	Min. Inner Sheath Thickness mm	Armour		Min. Outer Sheath Thickness mm	Overall Diameter Approx. mm	Weight Of Cable Approx. Kg/Km	Max. DC Resist. At 20°C Ω/Km	Current Ratings		
			GI Rd. Wire	GI Flat Strip 4x0.8mm					Direct in Ground Amps	In Ducts Amps.	In Air Amps.
2.5 x 2	0.9	0.30	1.4	---	1.24	13.8	350	12.1	25	21	21
4.0 x 2	1.0	0.30	1.4	---	1.24	15.2	425	7.41	32	27	27
6.0 x 2	1.0	0.30	1.4	---	1.24	16.6	475	4.61	40	34	35
10.0 x 2	1.0	0.30	1.4	---	1.24	18.6	565	3.08	55	45	47
16.0 x 2	1.0	0.30	---	0.8	1.40	17.0	500	1.91	70	58	59
25.0 x 2	1.2	0.30	---	0.8	1.40	19.5	650	1.20	90	76	78
35.0 x 2	1.2	0.30	---	0.8	1.40	21.0	750	0.868	110	92	99
50.0 x 2	1.4	0.30	---	0.8	1.40	24.0	950	0.641	135	115	125
70.0 x 2	1.4	0.30	---	0.8	1.56	26.0	1150	0.443	160	140	150
95.0 x 2	1.6	0.40	---	0.8	1.56	29.5	1460	0.320	190	170	185
120.0 x 2	1.6	0.40	---	0.8	1.56	31.5	1670	0.253	210	190	210
150.0 x 2	1.8	0.40	---	0.8	1.72	34.5	2010	0.206	240	210	240
185.0 x 2	2.0	0.50	---	0.8	1.88	38.5	2450	0.164	275	240	275

**POWER CABLES - THREE CORE**

Nominal Cross sectional Area in mm <sup>2</sup> & Cores	Nominal Insulation Thickness mm	Min. Inner Sheath Thickness mm	Armour		Min. Outer Sheath Thickness mm	Overall Diameter Approx. mm	Weight Of Cable Approx. Kg/Km	Max. DC Resist. At 20°C Ω/Km	Current Ratings		
			GI Rd. Wire	GI Flat Strip 4x0.8mm					Direct in Ground Amps	In Ducts Amps.	In Air Amps.
2.5 x 3	0.9	0.30	1.4	---	1.24	14.6	400	12.1	21	18	18
4.0 x 3	1.0	0.30	1.4	---	1.24	16.0	480	7.41	28	23	23
6.0 x 3	1.0	0.30	1.4	---	1.24	17.6	560	4.61	35	30	30
10.0 x 3	1.0	0.30	1.4	---	1.40	19.5	675	3.08	46	39	40
16.0 x 3	1.0	0.30	---	0.8	1.40	20.0	650	1.91	60	50	51
25.0 x 3	1.2	0.30	---	0.8	1.40	22.5	800	1.20	76	63	70
35.0 x 3	1.2	0.30	---	0.8	1.40	24.5	950	0.868	92	77	86
50.0 x 3	1.4	0.30	---	0.8	1.56	26.5	1200	0.641	110	95	105
70.0 x 3	1.4	0.40	---	0.8	1.56	31.0	1500	0.443	135	115	130
95.0 x 3	1.6	0.40	---	0.8	1.56	35.0	1900	0.320	165	140	155
120.0 x 3	1.6	0.40	---	0.8	1.72	38.0	2240	0.253	185	155	180
150.0 x 3	1.8	0.50	---	0.8	1.88	42.0	2700	0.206	210	175	205
185.0 x 3	2.0	0.50	---	0.8	1.88	46.0	3200	0.164	235	200	240

**POWER CABLES - THREE & HALF CORE**

Nominal Cross sectional Area in mm <sup>2</sup> & Cores	Nominal Insulation Thickness mm	Min. Inner Sheath Thickness mm	Armour		Min. Outer Sheath Thickness mm	Overall Diameter Approx. mm	Weight Of Cable Approx. Kg/Km	Max. DC Resist. At 20°C Ω/Km	Current Ratings		
			GI Rd. Wire	GI Flat Strip 4x0.8mm					Direct in Ground Amps	In Ducts Amps.	In Air Amps.
25.0 x 3.5	1.2 / 1.0	0.30	---	0.8	1.40	25.0	900	1.20/1.91	76	63	70
35.0 x 3.5	1.2 / 1.0	0.30	---	0.8	1.40	27.0	1030	0.868/1.91	92	77	86
50.0 x 3.5	1.4 / 1.2	0.30	---	0.8	1.56	31.0	1350	0.641/1.20	100	95	105
70.0 x 3.5	1.4 / 1.2	0.40	---	0.8	1.56	34.0	1725	0.443/0.868	135	115	130
95.0 x 3.5	1.6 / 1.4	0.40	---	0.8	1.56	39.0	2130	0.320/0.641	165	140	155
120.0 x 3.5	1.6 / 1.4	0.50	---	0.8	1.72	42.0	2580	0.253/0.443	185	155	180
150.0 x 3.5	1.8 / 1.4	0.50	---	0.8	1.88	46.5	3050	0.206/0.443	210	175	205
185.0 x 3.5	2.0 / 1.6	0.50	---	0.8	2.04	51.5	3650	0.164/0.320	285	200	240

**POWER CABLES - FOUR CORE**

Nominal Cross sectional Area in mm <sup>2</sup> & Cores	Nominal Insulation Thickness mm	Min. Inner Sheath Thickness mm	Armour		Min. Outer Sheath Thickness mm	Overall Diameter Approx. mm	Weight Of Cable Approx. Kg/Km	Max. DC Resist. At 20°C Ω/Km	Current Ratings		
			GI Rd. Wire	GI Flat Strip 4x0.8mm					Direct in Ground Amps	In Ducts Amps.	In Air Amps.
2.5 x 4	0.9	0.30	1.4	---	1.24	16.5	480	12.1	21	18	18
4.0 x 4	1.0	0.30	1.4	---	1.24	18.0	550	7.41	28	23	23
6.0 x 4	1.0	0.30	1.4	---	1.24	19.5	650	4.61	35	30	30
10.0 x 4	1.0	0.30	---	0.8	1.40	20.0	660	3.08	46	39	40
16.0 x 4	1.0	0.30	---	0.8	1.40	23.0	750	1.91	60	50	51
25.0 x 4	1.2	0.30	---	0.8	1.40	26.5	950	1.20	76	63	70
35.0 x 4	1.2	0.30	---	0.8	1.40	29.0	1165	0.868	92	77	86
50.0 x 4	1.4	0.40	---	0.8	1.56	33.5	1540	0.641	110	95	105
70.0 x 4	1.4	0.40	---	0.8	1.56	37.0	1800	0.443	135	115	130
95.0 x 4	1.6	0.40	---	0.8	1.72	42.0	2400	0.320	165	140	155
120.0 x 4	1.6	0.50	---	0.8	1.88	46.0	2800	0.253	185	155	180
150.0 x 4	1.8	0.50	---	0.8	1.88	50.5	3350	0.206	210	175	205
185.0 x 4	2.0	0.60	---	0.8	2.04	55.5	4000	0.164	235	200	240

NOTE : We also manufacture XLPE (Cross Link Polyethylene) Cable for LT grade according to ISI : 7098 Part-1

**Techno Flex Cables** Shielded Armoured / Unarmoured & Instrumentation Cable Specialist

PDX

Techno Flex Control Cables conforming to **IS : 1554 : Part-1**, by using bright annealed **Copper conductor**, PVC insulated, PVC inner sheathed unarmoured / armoured PVC sheathed cable for 1100V

### Control Cable - 1.5 sq.mm

No of cores	Nominal Insulation Thickness mm	Min. Inner Sheath Thickness mm	Armour		Nominal Sheath Thickness Unarm. mm	Min. Sheath Thickness Arm. mm	Overall Dia Approx.		Weight Of Cables Approx.		Max. DC Resist. At 20°C Ω/Km	Current Ratings		
			GI Rd. Wire	GI Flat Strip 4x0.8			Unarm	Arm	Unarm	Arm		In Grd Amp	In Ducts Amp	In Air Amp
2	0.80	0.30	1.4	---	1.80	1.24	10.6	13.0	130	350	12.1	23	20	20
3	0.80	0.30	1.4	---	1.80	1.24	11.2	14.0	160	400	12.1	21	17	17
4	0.80	0.30	1.4	---	1.80	1.24	12.0	14.8	190	450	12.1	21	17	17
5	0.80	0.30	1.4	---	1.80	1.24	13.0	15.7	225	500	12.1	21	17	17
6	0.80	0.30	1.4	---	1.80	1.24	14.0	16.6	250	550	12.1	15	13	13
7	0.80	0.30	1.4	---	1.80	1.24	14.0	16.6	265	565	12.1	14	13	13
10	0.80	0.30	1.4	---	1.80	1.40	17.0	20.0	350	750	12.1	13	11	11
12	0.80	0.30	---	0.80	1.80	1.40	17.6	19.5	400	650	12.1	12	10	10
14	0.80	0.30	---	0.80	1.80	1.40	18.5	20.0	450	760	12.1	11	10	10
16	0.80	0.30	---	0.80	1.80	1.40	19.5	21.0	500	800	12.1	11	09	09
19	0.80	0.30	---	0.80	2.00	1.40	20.8	22.0	600	850	12.1	10	09	09
24	0.80	0.30	---	0.80	2.00	1.40	24.0	25.6	725	1050	12.1	09	08	08
30	0.80	0.30	---	0.80	2.00	1.40	25.5	27.0	860	1200	12.1	09	07	07
37	0.80	0.30	---	0.80	2.00	1.40	27.0	28.6	1050	1400	12.1	08	07	07
61	0.80	0.40	---	0.80	2.20	1.56	33.5	35.5	1650	2100	12.1	07	06	06

### Control Cable - 2.5 sq.mm

No of cores	Nominal Insulation Thickness mm	Min. Inner Sheath Thickness mm	Armour		Nominal Sheath Thickness Unarm. mm	Min. Sheath Thickness Arm. mm	Overall Dia Approx.		Weight Of Cables Approx.		Max. DC Resist. At 20°C Ω/Km	Current Ratings		
			GI Rd. Wire	GI Flat Strip 4x0.8			Unarm	Arm	Unarm	Arm		In Grd Amp	In Ducts Amp	In Air Amp
2	0.90	0.30	1.4	---	1.80	1.24	11.8	14.5	160	425	7.41	32	27	27
3	0.90	0.30	1.4	---	1.80	1.24	12.5	15.5	225	475	7.41	27	24	24
4	0.90	0.30	1.4	---	1.80	1.24	13.5	16.3	250	530	7.41	27	24	24
5	0.90	0.30	1.4	---	1.80	1.24	14.5	17.4	300	600	7.41	27	24	24
6	0.90	0.30	1.4	---	1.80	1.24	16.0	18.4	340	675	7.41	20	18	18
7	0.90	0.30	1.4	---	1.80	1.24	16.0	18.4	375	700	7.41	20	17	17
10	0.90	0.30	---	0.80	1.80	1.40	19.5	21.3	500	780	7.41	18	15	15
12	0.90	0.30	---	0.80	2.00	1.40	20.5	22.1	600	850	7.41	17	14	14
14	0.90	0.30	---	0.80	2.00	1.40	21.5	23.0	650	950	7.41	16	13	13
16	0.90	0.30	---	0.80	2.00	1.40	22.5	24.0	750	1050	7.41	15	13	13
19	0.90	0.30	---	0.80	2.00	1.40	23.5	25.1	850	1150	7.41	14	12	12
24	0.90	0.30	---	0.80	2.00	1.40	27.5	29.0	1050	1400	7.41	13	11	11
30	0.90	0.30	---	0.80	2.00	1.56	29.0	30.5	1250	1700	7.41	12	10	10
37	0.90	0.30	---	0.80	2.20	1.56	31.5	33.0	1550	2000	7.41	11	10	10
61	0.90	0.40	---	0.80	2.20	1.56	39.0	40.5	2450	3100	7.41	09	08	08

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## Basic assumptions for Current ratings

- (1) Max. Conductor Temp. : 70°C
- (2) Thermal resistivity soil : 150°C CM/W
- (3) Thermal resistivity of PVC : 650°C CM/W
- (4) Ground temperature : 30°C
- (5) Amb. air temperature : 40°C
- (6) Depth of laying : 75 cm  
(highest pt. of cable laid)

## Rating Factors

### 1. Rating Factor for depth of laying Twin & Multicore Cables

Depth Of laying cm	Upto 25mm <sup>2</sup>	Above 25mm <sup>2</sup> & 300mm <sup>2</sup>	Above 300mm <sup>2</sup>	Multicore
75	1	1	1	1
90	0.99	0.98	0.97	0.99
105	0.98	0.97	0.96	0.98
120	0.97	0.96	0.95	0.97
150	0.96	0.94	0.92	0.96
180 OR More	0.95	0.93	0.91	0.95

### 2. Rating Factor for the Single Core Cables (AC) in the formation in Air applied to the corresponding ratings for trefoil groups in air.

Nominal Area Of Conductor mm <sup>2</sup>	Rating Factor
Upto & Including 185	1.07
240	1.10
300	1.08
400	1.04
500	1.00
630	1.00

### 3. Rating Factor for variation in Underground temperature for Cables laid direct in ground & laid in duct.

Ground Temperature °C	15	20	25	30	35	40	45
Rating Temperature	1.17	1.12	1.06	1.0	0.94	0.87	0.79

### 4. Rating Factor for variation in Ambient Air temperature for Cables laid direct in ground & laid in duct.

Ambient Temperature °C	20	25	30	35	40	45	50
Rating Temperature	1.33	1.25	1.16	1.09	1.0	0.90	0.83

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## Short Circuit Rating Of Alluminium Conductor Cable :-

Techno Flex cables manufacturing method based on quality assurance plan & use of high standard raw material, therefore it withstand high Magnitude of short circuit rating. It is calculated as under :

$$I_{sh} = \frac{75.8 \times A}{\sqrt{t}}$$

where  $I_{sh}$  → short circuit ratings in r.m.s. amp.  
 $t$  → duration of short circuit in seconds  
 $A$  → Area of conductor in sq.mm

Tabulated The Constants For Different Duration Of Short Circuits :-

Duration of Short Circuit in sec.	1 Cycle = 0.02 sec	2 Cycle = 0.04 sec	5 Cycle = 0.1 sec	10 Cycle = 0.2 sec	25 Cycle = 0.5 sec	50 Cycle = 1.0 sec	2 sec	3 sec	4 sec	5 sec
Short Circuit constant Per unit area	536	378	239	169	107	75.7	53.0	43.6	37.8	34

Example : Short Circuit rating of 70 sq.mm area of conductor with short duration 0.5 sec =  $70 \times 107 = 7490A$

## Recommendations For Installation :

Cables are the most important asset of any organization. Any damage to it will result in break down of the complete plant & machinery, hence proper attention should be paid while handling and laying them. So for its salient features which should be kept in view during installation as under :-

1. Before laying the installation of the cable, It should be checked by meggar as a preliminary check against any probable fault.
2. The drum should be always rolled in the direction of the arrow or opposite to the outside cable end.
3. Avoid the possibility cable twist which will brutally damage the cable because cable have itself twisting force.
4. Properly check the sequence of cores & no crossing of cores while connecting, also decide the direction in which the cable is to be pulled.
5. Possible bending radius should be 12 times the overall diameter of the cable to be maintained. But at any case it should not be less than 8 times.
6. In low temperature area the bending should not be very small radius because PVC compound become stiff & brittle and it shall get crack.
7. All joints terminations armour wires & external metallic bonding should be connected to the earth, wherever possible armour at one end of the cable should be connected to main earth system at the supplying end by employing metallic connectors.  
 Precautions should be taken to eliminate the chemical & by metallic corrosion of the earth connector.
8. The design of the box & composition of the filling compound should provide an effective sealing against entry of moisture to conductor & armour connector.
9. If hot pouring protective compounds are used, the temperature of the compound while pouring should not exceed 150°C.
10. Where the cables are crossing the roads, the same should be laid in concrete ducts & avoid the sharp edges of concrete ducts in other hand cable may be damaged.
11. We strongly recommend the user that after installation, 2KV DC voltage test should be carried out, through the each core before earthing.