



افشار نجاد

KHORASAN ELECTRIC IND. CO.



AFSHAR NEJAD



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## About us

Khorasan Electric Industrial company with 40 years of successful history in production of Wire & Cable is a shining star among Iranian cable industries.

We were established in 1966 and our operations started in 1967.

At present the company has 400 workforce strong working in the factory.

The annual production capacity of 20,000 tons which can any wanted. The production process are administered by high level expert engineers and efficient technicians, so we are aquinted with a high level of quality as a well-known and admired wire and cable industrialist.

Production covers a wide variety of standards in low voltage wire and cable including power cables, Control cables, Vehicle wires, Building wires, Coaxial cables, Instrument cables, MDF cables, Halogen-free cables, Fire resistant cable, Over head hard drawn bare copper wires, ACSR wires, etc..., and different pvc granules.

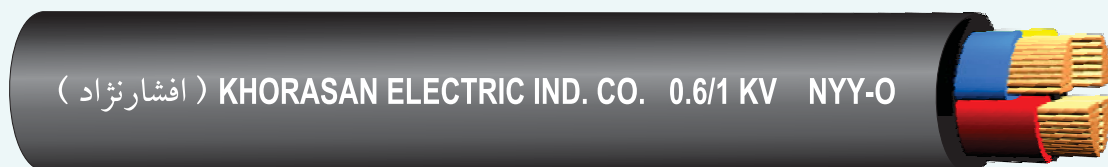
Khorasan Electric Industrial company was awarded the title of best producer of wire and cable in Khorasan province, due to its utilization of up to date technology and machinery, Which upgrade the quality of our products.

The company is authorized to use logo of Institute of Standard and Industrial Research of Iran (ISIRI).

Which is according to IEC 60227 standards and we are capable of production according to all major standards in the world including British Standard (BSI) , German Standard (DIN VDE) and international standard (IEC) .



## Power cable NYY-J and NYY-O 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC
- Copper conductor  
class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply can be installed in underground , in water , indoors ,in cable ducts , power stations ,for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected .

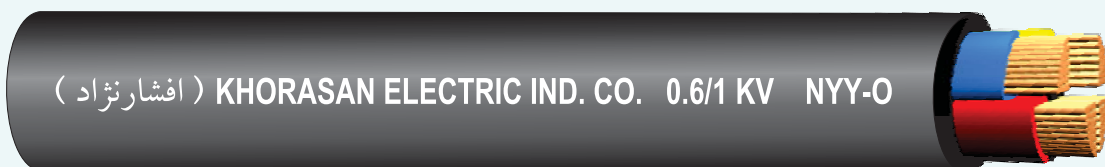
No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x 4	1.0	1.4	7.4	4.61	47	112
1 x 6	1.0	1.4	8.0	3.08	59	136
1 x 10	1.0	1.4	8.9	1.83	81	180
1 x 16	1.0	1.4	10.0	1.15	107	235
1 x 25	1.2	1.4	11.7	0.727	144	365
1 x 35	1.2	1.4	12.8	0.524	176	468
1 x 50	1.4	1.4	14.0	0.387	214	616
1 x 70	1.4	1.4	16.0	0.268	270	814
1 x 95	1.6	1.5	18.2	0.193	334	1120
1 x 120	1.6	1.6	20.2	0.153	389	1372
1 x 150	1.8	1.6	22.0	0.124	446	1660
1 x 185	2.0	1.7	24.5	0.0991	516	2065
1 x 240	2.2	1.8	27.5	0.0754	618	2642
1 x 300	2.4	1.9	30.0	0.0601	717	3220
1 x 400	2.6	2.0	33.5	0.0470	843	4170
1 x 500	2.8	2.1	37.2	0.0366	994	5190
1 x 630	2.8	2.3	43.0	0.0283	1180	6650

2 x 1.5	0.8	1.8	11.6	12.10	19.5	185
2 x 2.5	0.8	1.8	12.5	7.41	25	225
2 x 4	1.0	1.8	14.2	4.61	34	300
2 x 6	1.0	1.8	15.2	3.08	43	370
2 x 10	1.0	1.8	16.9	1.83	59	495
2 x 16	1.0	1.8	19.8	1.15	79	705
2 x 25	1.2	1.8	23.0	0.727	106	960

3 x 1.5re	0.8	1.8	12.0	12.10	19.5	207
3 x 2.5re	0.8	1.8	12.9	7.41	25	255
3 x 4 re	1.0	1.8	14.8	4.61	34	350
3 x 6re	1.0	1.8	15.8	3.08	43	430
3 x 10rm	1.0	1.8	18.6	1.83	59	635
3 x 16rm	1.0	1.8	20.9	1.150	79	870
3 x 25rm	1.2	1.8	24.6	0.727	106	1310
3 x 35rm	1.2	1.8	26.3	0.524	129	1523
3 x 50sm	1.4	1.8	24.5	0.387	157	1860
3 x 70sm	1.4	1.8	28.0	0.268	199	2435
3 x 95sm	1.6	1.9	32.0	0.193	246	3290
3x120sm	1.6	2.0	34.5	0.153	285	4115
3x150sm	1.8	2.1	38.0	0.124	326	4930
3x185sm	2.0	2.2	42.0	0.0991	374	6480
3x240sm	2.2	2.4	47.0	0.0754	445	8270



## Power cable NYY-J and NYY-O 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_n/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC
- Copper conductor  
class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply can be installed in underground , in water , indoors ,in cable ducts , power stations ,for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected .

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
3 x 25/16	1.2/1	1.8	26.5	0.727/1.15	106	1525
3 x 35/16	1.2/1	1.9	28.5	0.524/1.15	129	1740
3 x 50/25	1.4/1.2	1.8	28.5	0.387/0.727	157	2360
3 x 70/35	1.4/1.2	1.9	31.0	0.268/0.524	199	2870
3 x 95/50	1.6/1.4	2.1	36.0	0.193/0.387	246	3855
3x120/70	1.6/1.4	2.1	39.0	0.153/0.268	285	4792
3x150/70	1.8/1.4	2.3	43.2	0.124/0.268	326	5825
3x185/95	2/1.6	2.4	47.0	0.0991/0.193	374	7630
3x240/120	2.2/1.6	2.6	54.0	0.0754/0.153	445	9830
3x300/150	2.4/1.8	2.8	61.0	0.0601/0.124	511	11460

4 x 1.5re	0.8	1.8	12.8	12.1	19.5	239
4 x 2.5re	0.8	1.8	13.8	7.41	25	300
4 x 4 re	1.0	1.8	15.9	4.61	34	413
4 x 6 re	1.0	1.8	17.1	3.08	43	520
4 x 10 rm	1.0	1.8	20.2	1.83	59	772
4 x 16 rm	1.0	1.8	22.7	1.15	79	1068
4 x 25 rm	1.2	1.8	26.9	0.727	106	1650
4 x 35 rm	1.2	1.9	29.0	0.524	129	1910
4 x 50sm	1.4	1.8	29.0	0.387	157	2340
4 x 70sm	1.4	2.0	33.0	0.268	199	3090
4 x 95sm	1.6	2.1	38.0	0.193	246	4260
4x120sm	1.6	2.2	41.0	0.153	285	5315
4x150sm	1.8	2.3	46.0	0.124	326	6395
4x185sm	2.0	2.5	50.0	0.0991	374	8483
4x240sm	2.2	2.7	56.5	0.0754	445	11020

5 x 1.5	0.8	1.8	13.7	12.1	14.6	272
5 x 2.5	0.8	1.8	14.8	7.41	18.5	350
5 x 4	1.0	1.8	17.1	4.61	25.5	490
5 x 6	1.0	1.8	18.5	3.08	32.0	608
5 x 10	1.0	1.8	22.0	1.83	44.0	915
5 x 16	1.0	1.8	22.8	1.15	59.0	1280
5 x 25	1.2	1.9	29.6	0.727	79.0	1950
5 x 35	1.2	2.0	32.5	0.524	97.0	2390
5 x 50	1.4	2.1	38.0	0.387	118.0	3480



## Light PVC sheathed cables NYM 300/500 V

(افشار تراد) KHORASAN ELECTRIC IND. CO. 300/500 V NYM

### Technical data :

- PVC sheathed cable to VDE 0250 , IEC 60227 and ISIRI 607-10
- Temperature range : flexing -5°C to +50°C fixed installation -30°C to +70°C
- Nominal voltage :  $U_n/U=300/500$  V
- Test voltage a.c. ,50Hz : 2000V

### Cable structure :

- Cu / PVC / PVC
- Copper conductor class1 or 2 acc. to IEC 60228
- Insulation PVC/C
- Sheath PVC/ST4

### Application :

- For industrial and wiring purposes, usable in the open ,in dry ,damp and wet environments in the open and concealed, as well as in masonry and in beton ,not suitable for imbedding in solidified or compressed-concrete. Outdoor usage is only possible, as long as the cable is protected against direct sunlight.

No. cores xNominal cross section mm <sup>2</sup>	No. of strands x dia mm	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 1.5	1 x 1.38	0.7	1.2	9.5	12.1	19.5	135
	7 x 0.50			10.5	13.3		150
2 x 2.5	1 x 1.78	0.8	1.2	11.0	7.4	26.0	175
	7 x 0.67			11.5	8.0		200
2 x 4	1 x 2.25	0.8	1.2	12.0	4.6	35.0	232
	7 x 0.85			12.6	5.0		248
2 x 6	1 x 2.76	0.8	1.2	12.9	3.1	46.0	295
	7 x 1.04			13.6	3.3		315
2 x 10	1 x 3.57	1.0	1.4	16.0	1.8	63.0	455
	7 x 1.35			17.0	1.9		490
2 x 16	7 x 1.70	1.0	1.4	19.0	1.2	87.0	670
2 x 25	7 x 2.14	1.2	1.4	22.5	0.8	115.0	985
2 x 35	7 x 2.25	1.2	1.6	25.3	0.6	143.0	1290
3 x 1.5	1 x 1.38	0.7	1.2	10.0	12.1	19.5	160
	7 x 0.50			10.6	13.3		171
3 x 2.5	1 x 1.78	0.8	1.2	11.3	7.4	26.0	215
	7 x 0.67			12.0	8.0		235
3 x 4	1 x 2.25	0.8	1.2	12.4	4.6	35.0	275
	7 x 0.85			13.1	5.0		300
3 x 6	1 x 2.76	0.8	1.4	14.0	3.1	46.0	370
	7 x 1.04			14.8	3.3		398
3 x 10	1 x 3.57	1.0	1.4	16.8	1.8	63.0	550
	7 x 1.35			17.8	1.9		600
3 x 16	7 x 1.70	1.0	1.4	20.0	1.2	87.0	840
3 x 25	7 x 2.14	1.2	1.6	24.0	0.8	115.0	1260
3 x 35	7 x 2.25	1.2	1.6	26.8	0.6	143.0	1620



## Light PVC sheathed cables NYM 300/500 V

(افشارتراد) KHORASAN ELECTRIC IND. CO. 300/500 V NYM



### Technical data :

- PVC sheathed cable to VDE 0250 , IEC 60227 and ISIRI 607-10
- Temperature range : flexing -5°C to +50°C fixed installation -30°C to +70°C
- Nominal voltage :  $U_n/U=300/500$  V
- Test voltage a.c. ,50Hz : 2000V

### Cable structure :

- Cu / PVC / PVC
- Copper conductor class1 or 2 acc. to IEC 60228
- Insulation PVC/C
- Sheath PVC/ST4

### Application :

- For industrial and wiring purposes, usable in the open ,in dry ,damp and wet environments in the open and concealed, as well as in masonry and in beton ,not suitable for imbedding in solidified or compressed-concrete. Outdoor usage is only possible, as long as the cable is protected against direct sunlight.

No. cores xNominal cross section mm <sup>2</sup>	No. of strands x dia mm	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
4 x 1.5	1 x 1.38	0.7	1.2	10.8	12.1	17.5	190
	7 x 0.50			11.1	13.3		200
4 x 2.5	1 x 1.78	0.8	1.2	12.2	7.4	24.0	255
	7 x 0.67			12.7	8.0		275
4 x 4	1 x 2.25	0.8	1.4	13.5	4.6	32.0	350
	7 x 0.85			14.5	5.0		370
4 x 6	1 x 2.76	0.8	1.4	15.1	3.1	41.0	450
	7 x 1.04			16.0	3.3		480
4 x 10	1 x 3.57	1.0	1.4	18.0	1.8	57.0	685
	7 x 1.35			19.2	1.9		735
4 x 16	7 x 1.70	1.0	1.4	21.9	1.2	76.0	1030
4 x 25	7 x 2.14	1.2	1.6	26.5	0.8	96.0	1560
4 x 35	7 x 2.25	1.2	1.6	29.2	0.6	135.0	2030
5 x 1.5	1 x 1.38	0.7	1.2	11.3	12.1	17.5	220
	7 x 0.50			12.0	13.3		230
5 x 2.5	1 x 1.78	0.8	1.2	13.0	7.4	24.0	300
	7 x 0.67			13.6	8.0		322
5 x 4	1 x 2.25	0.8	1.4	15.0	4.6	32.0	412
	7 x 0.85			16.0	5.0		440
5 x 6	1 x 2.76	0.8	1.4	16.3	3.1	41.0	532
	7 x 1.04			17.2	3.3		570
5 x 10	1 x 3.57	1.0	1.4	19.6	1.8	57.0	810
	7 x 1.35			21.0	1.9		876
5 x 16	7 x 1.70	1.0	1.6	24.4	1.2	76.0	1260
5 x 25	7 x 2.14	1.2	1.6	29.0	0.8	96.0	1875
5 x 35	7 x 2.25	1.2	1.6	32.6	0.6	135.0	2485



## Control cable NYY (PVC insulated , PVC sheathed) 0.6/1 KV



( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYY

### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC
- Copper conductor  
class1 & 2 acc. to IEC 60228
- Insulation PVC/A
- Sheath PVC/ST2 90°C

### Application :

- As control and connecting cable in machines , conveyor belts ,production lines ,machine tool industries , progressive assembly lines , automatic handling apparatus for medium mechanical stress and for fixed installation but not suitable for open air.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
7 x 1.5	0.8	1.8	14.5	12.1	12.5	330
8 x 1.5	0.8	1.8	15.7	12.1	11.7	360
10x 1.5	0.8	1.8	18.0	12.1	10.5	485
12x 1.5	0.8	1.8	18.5	12.1	10	520
14x 1.5	0.8	1.8	19.2	12.1	9.7	555
16x 1.5	0.8	1.8	20.0	12.1	9.1	590
19x 1.5	0.8	1.8	21.0	12.1	8.5	690
21x 1.5	0.8	1.8	22.5	12.1	8.3	750
24x 1.5	0.8	1.8	24.0	12.1	7.6	910
30x 1.5	0.8	1.8	25.5	12.1	7.2	1036
40x 1.5	0.8	1.8	28.0	12.1	6.5	1400
52x 1.5	0.8	1.9	32.0	12.1	6.2	1655
61x 1.5	0.8	2.0	35.0	12.1	5.8	1940

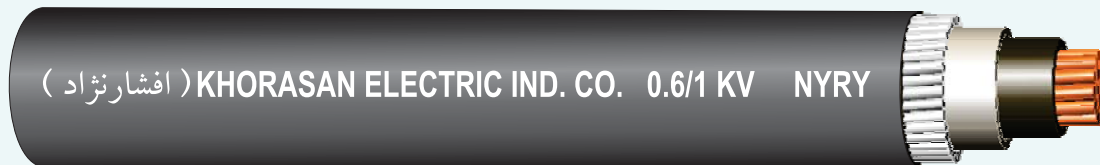
7 x 2.5	0.8	1.8	16.0	7.41	16.9	420
8 x 2.5	0.8	1.8	16.8	7.41	15.6	450
10x 2.5	0.8	1.8	19.5	7.41	14.3	580
12x 2.5	0.8	1.8	20.0	7.41	13.5	650
14x 2.5	0.8	1.8	21.0	7.41	13	750
16x 2.5	0.8	1.8	22.0	7.41	12.2	820
19x 2.5	0.8	1.8	23.0	7.41	11.7	905
21x 2.5	0.8	1.8	23.8	7.41	11.4	1060
24x 2.5	0.8	1.8	26.5	7.41	10.4	1280
30x 2.5	0.8	1.8	28.0	7.41	9.6	1450
40x 2.5	0.8	1.9	31.3	7.41	9.1	1910
52x 2.5	0.8	2.1	37.0	7.41	8.3	2400
61x 2.5	0.8	2.1	38.0	7.41	7.8	2720





## Power cable NYRY (wire armoured) 0.6/1 KV

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYRY



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range : flexing -5°C to +50°C fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC / SWA / PVC
- Copper conductor class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Galvanised steel or aluminium wire armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply can be installed in underground , in water , indoors ,in cable ducts , power stations, for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected ., for better mechanical protection armoured cables are used. For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour $\phi$ mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x 10	1.0	0.9	1.8	14.5	1.83	81	340
1 x 16	1.0	0.9	1.8	15.5	1.15	107	415
1 x 25	1.2	1.25	1.8	18.0	0.727	144	600
1 x 35	1.2	1.25	1.8	19.0	0.524	176	690
1 x 50	1.4	1.25	1.8	20.2	0.387	214	850
1 x 70	1.4	1.6	1.8	22.7	0.268	270	1160
1 x 95	1.6	1.6	1.8	25.0	0.193	334	1460
1 x 120	1.6	1.6	1.8	27.0	0.153	389	1750
1 x 150	1.8	1.6	1.8	28.5	0.124	446	2100
1 x 185	2.0	1.6	1.9	31.0	0.0991	516	2500
1 x 240	2.2	2.0	2.0	35.0	0.0754	618	3280
1 x 300	2.4	2.0	2.1	38.0	0.0601	717	4000
1 x 400	2.6	2.0	2.2	42.0	0.047	843	4900
1 x 500	2.8	2.0	2.4	45.0	0.0366	994	6100

Approx. weights for single core cables are basis of aluminium wire armouring

Available armouring with galvanised steel on request ( for D.C systems )

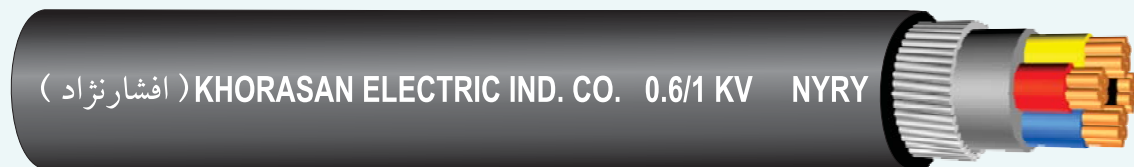
No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour $\phi$ mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx weight kg/km
2 x 1.5	0.8	0.90	1.8	14.2	12.1	19.5	385
2 x 2.5	1.0	0.90	1.8	15.0	7.41	26	440
2 x 4	1.0	1.25	1.8	17.5	4.61	34	645
2 x 6	1.0	1.25	1.8	18.5	3.08	44	735
2 x 10	1.0	1.25	1.8	20	1.83	60	900
2 x 16	1.0	1.25	1.8	21.2	1.15	80	970
2 x 25	1.2	1.60	1.8	27.5	0.727	108	1770

Approx. weights for multi core cables are basis of galvanised steel wire armouring



## Power cable NYRY (wire armoured) 0.6/1 KV

( افشار تراژ ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYRY



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range : flexing -5°C to +50°C fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC / SWA / PVC
- Copper conductor class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Galvanised steel or aluminium wire armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply can be installed in underground , in water , indoors ,in cable ducts , power stations, for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected ., for better mechanical protection armoured cables are used. For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour $\phi$ mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
3 x 1.5	0.8	0.9	1.8	15	12.1	19.5	415
3 x 2.5	0.8	0.9	1.8	15.5	7.41	26	480
3 x 4	1.0	1.25	1.8	18.0	4.61	34	705
3 x 6	1.0	1.25	1.8	19.1	3.08	44	815
3 x 10	1.0	1.25	1.8	21.0	1.83	60	1020
3 x 16	1.0	1.6	1.8	25.0	1.15	80	1530
3 x 25	1.2	1.6	1.9	29.0	0.727	108	2070
3 x 35	1.2	1.6	1.9	30.5	0.524	132	2380
3 x 50sm	1.4	1.6	1.9	31.0	0.387	160	2550
3 x 70sm	1.4	2.0	2.0	35.0	0.268	202	3600
3 x 95sm	1.6	2.0	2.1	39.0	0.193	249	4550
3x120sm	1.6	2.0	2.2	41.5	0.153	289	5400
3x150sm	1.8	2.0	2.3	45.0	0.124	329	6400
3x185sm	2.0	2.5	2.5	50.0	0.0991	377	8150
3x240sm	2.2	2.5	2.6	55.0	0.0754	443	10200
3x300sm	2.4	2.5	3.0	65.0	0.0601	504	12900

### 3.5 cores

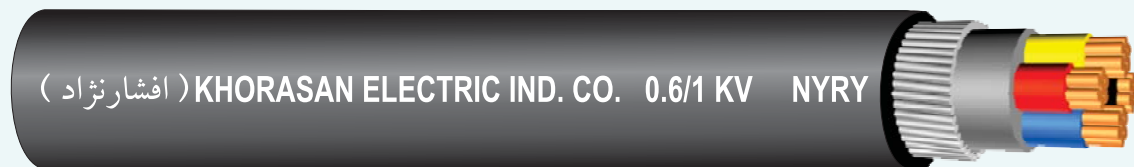
3x25/16	1.2/1	1.6	1.9	32.5	0.727/1.15	108	2250
3x35/16	1.2/1	1.6	2.0	34.5	0.524/1.15	132	2650
3x50/25	1.4/1.2	2.0	2.0	36.0	0.387/0.727	160	3300
3x70/35	1.4/1.2	2.0	2.1	39.0	0.268/0.524	202	4100
3x95/50	1.6/1.4	2.0	2.3	44.0	0.193/0.387	249	5300
3x120/70	1.6/1.4	2.5	2.4	48.0	0.153/0.268	289	6800
3x150/70	1.8/1.4	2.5	2.6	52.0	0.124/0.268	329	7980
3x185/95	2/1.6	2.5	2.7	56.5	0.0991/0.193	377	9600
3x240/120	2.2/1.6	2.5	2.9	63.5	0.0754/0.153	443	12100
3x300/150	2.4/1.8	2.5	3.1	70.0	0.0601/0.124	504	14500

Approx. weights for multi core cables are basis of galvanised steel wire armouring



## Power cable NYRY (wire armoured) 0.6/1 KV

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYRY



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range : flexing -5°C to +50°C fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC / SWA / PVC
- Copper conductor class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Galvanised steel or aluminium wire armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply can be installed in underground , in water , indoors ,in cable ducts , power stations, for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected ., for better mechanical protection armoured cables are used. For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour $\phi$ mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
4 x 1.5re	0.8	0.90	1.8	15.6	12.1	19.5	460
4 x 2.5re	0.8	1.25	1.8	17.2	7.41	26	640
4 x 4 re	1.0	1.25	1.8	19.5	4.61	34	820
4 x 6 re	1.0	1.25	1.8	21.0	3.08	44	950
4 x 10 rm	1.0	1.6	1.8	24.5	1.83	60	1450
4 x 16 rm	1.0	1.6	1.8	27.0	1.15	80	1820
4 x 25 rm	1.2	1.6	1.8	31.5	0.727	108	2500
4 x 35 rm	1.2	2.0	2.0	34.5	0.524	132	3100
4 x 50sm	1.4	2.0	2.1	36.0	0.387	160	3550
4 x 70sm	1.4	2.0	2.2	41.0	0.268	202	4550
4 x 95sm	1.6	2.0	2.3	45.5	0.193	249	4800
4x120sm	1.6	2.5	2.5	49.5	0.153	289	7350
4x150sm	1.8	2.5	2.6	54.0	0.124	329	8800
4x185sm	2.0	2.5	2.8	58.8	0.0991	377	1066
4x240sm	2.2	2.5	3.0	65.0	0.0754	443	13500
4x300sm	2.4	2.5	3.1	70.5	0.0601	504	16100

5 x 1.5	0.8	1.25	1.8	17.0	12.1	14.6	600
5 x 2.5	0.8	1.25	1.8	18.2	7.41	19.5	700
5 x 4	1.0	1.25	1.8	20.5	4.61	25.5	900
5 x 6	1.0	1.6	1.8	22.5	3.08	33	1200
5 x 10	1.0	1.6	1.8	24.8	1.83	45	1510
5 x 16	1.0	1.6	1.9	29.5	1.15	60	2090
5 x 25	1.2	2.0	2.1	35.5	0.727	99	3150

Approx. weights for multi core cables are basis of galvanised steel wire armouring



## Power cable NYBY (tape armoured) 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu /PVC /PVC /DTA /PVC
- Copper conductor  
class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Double tape Galvanised steel armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations , for industry and distribution boards as well as in subscriber networks .where mechanical damages are not to be expected, for better mechanical protection armoured cables are used. For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Tape Armour thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 1.5	0.8	0.2	1.8	13.0	12.1	19.5	260
2 x 2.5	1.0	0.2	1.8	13.5	7.41	26	305
2 x 4	1.0	0.2	1.8	15.5	4.61	34	395
2 x 6	1.0	0.2	1.8	16.5	3.08	44	510
2 x 10	1.0	0.2	1.8	18	1.83	60	615
2 x 16	1.0	0.2	1.8	21	1.15	80	845
2 x 25	1.2	0.2	1.8	25	0.727	108	1200

3 x 1.5	0.8	0.2	1.8	13.5	12.1	19.5	300
3 x 2.5	0.8	0.2	1.8	14.2	7.41	26	350
3 x 4	1.0	0.2	1.8	16.0	4.61	34	457
3 x 6	1.0	0.2	1.8	17.5	3.08	44	575
3 x 10	1.0	0.2	1.8	19.5	1.83	60	740
3 x 16	1.0	0.2	1.8	22.0	1.15	80	1020
3 x 25	1.2	0.2	1.8	26.0	0.727	108	1480
3 x 35	1.2	0.2	1.8	28.0	0.524	132	1730
3x50sm	1.4	0.2	1.8	28.5	0.387	160	2050
3x70sm	1.4	0.2	1.9	32.0	0.268	202	2740
3x95sm	1.6	0.2	2.0	36.0	0.193	249	3800
3x120sm	1.6	0.5	2.1	39.0	0.153	289	4780
3x150sm	1.8	0.5	2.2	43.0	0.124	329	5860
3x185sm	2.0	0.5	2.3	46.0	0.0991	377	7150
3x240sm	2.2	0.5	2.5	52.0	0.0754	443	9190
3x300sm	2.4	0.5	2.9	61.0	0.0601	504	11200

### 3.5 cores

3 x 25/16	1.2/1	0.2	1.8	29.0	0.727/1.15	108	1650
3 x 35/16	1.2/1	0.2	1.9	41.5	0.524/1.15	132	2020
3 x 50/25	1.4/1.2	0.2	1.9	32.0	0.387/0.727	160	2400
3 x 70/35	1.4/1.2	0.2	2.0	35.0	0.268/0.524	202	3170
3 x 95/50	1.6/1.4	0.5	2.2	41.0	0.193/0.387	249	4520
3x 120/70	1.6/1.4	0.5	2.3	44.0	0.153/0.268	289	5530
3x 150/70	1.8/1.4	0.5	2.4	48.0	0.124/0.268	329	6600
3x 185/95	2/1.6	0.5	2.6	53.0	0.0991/0.193	377	8200
3x240/120	2.2/1.6	0.5	2.8	59.0	0.0754/0.153	443	10450
3x300/150	2.4/1.8	0.5	3.0	65.0	0.0601/0.124	504	12800

Approx. weights for multi core cables are basis of galvanised steel tape armouring .



## Power cable NYBY (tape armoured) 0.6/1 KV



( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYBY

### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu /PVC /PVC /DTA /PVC
- Copper conductor  
class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Double tape Galvanised steel armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations , for industry and distribution boards as well as in subscriber networks .where mechanical damages are not to be expected, for better mechanical protection armoured cables are used. For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Tape Armour thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
4 x 1.5re	0.8	0.2	1.8	13.9	12.1	19.5	350
4 x 2.5re	0.8	0.2	1.8	14.9	7.41	26	410
4 x 4 re	1.0	0.2	1.8	17.0	4.61	34	550
4 x 6 re	1.0	0.2	1.8	18.1	3.08	44	670
4 x 10 rm	1.0	0.2	1.8	21.3	1.83	60	940
4 x 16 rm	1.0	0.2	1.8	24.0	1.15	80	1260
4 x 25 rm	1.2	0.2	1.8	28.0	0.727	108	1780
4 x 35 rm	1.2	0.2	1.9	30.0	0.524	132	2150
4 x 50sm	1.4	0.2	1.9	32.5	0.387	160	2530
4 x 70sm	1.4	0.5	2.1	38.0	0.268	202	3750
4 x 95sm	1.6	0.5	2.2	42.5	0.193	249	4990
4x120sm	1.6	0.5	2.3	45.5	0.153	289	6020
4x150sm	1.8	0.5	2.5	50.0	0.124	329	7380
4x185sm	2.0	0.5	2.6	54.5	0.0991	377	9020
4x240sm	2.2	0.5	2.8	61.0	0.0754	443	11610

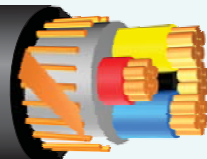
5 x 1.5	0.8	0.2	1.8	14.7	12.1	14.6	380
5 x 2.5	0.8	0.2	1.8	16.0	7.41	19.5	470
5 x 4	1.0	0.2	1.8	18.3	4.61	25.5	640
5 x 6	1.0	0.2	1.8	19.6	3.08	33	790
5 x 10	1.0	0.2	1.8	23.1	1.83	45	1100
5 x 16	1.0	0.2	1.8	26.0	1.15	60	1550
5 x 25	1.2	0.2	1.9	31.0	0.727	81	2230

Approx. weights for multi core cables are basis of galvanised steel tape armouring .



## Power cable NYCY (with concentric copper conductor) 0.6/1 KV

( افشارنژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYCY



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC / Cu / PVC
- Copper conductor  
class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Concentric conductor in inner layer of round copper wires , outer layer with copper tape.
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are used for industry and distribution boards , power stations and house connecting boxes. Overall, where increased electrical are required.
- These cables are installed in underground, in water, indoors and in cable ducts .
- The concentric conductor (c) is allowed to use an neutral, protective or earthed conductor.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x6 + 6	1.0	1.4	9.2	3.08	46.0	203
1 x10+10	1.0	1.4	10.8	1.83	62.0	305
1 x16+16	1.0	1.4	12.1	1.15	83.0	440
1 x25+25	1.2	1.5	16.5	0.73	111.0	740

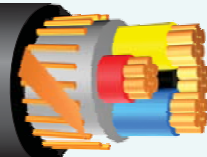
2x1.5+1.5	0.8	1.8	12.8	12.10	20	207
2x2.5+2.5	0.8	1.8	13.6	7.41	26	260
2 x 4 + 4	1.0	1.8	15.5	4.61	34	355
2 x 6 + 6	1.0	1.8	17.0	3.08	44	435
2 x10+10	1.0	1.8	20.0	1.83	60	635
2 x16+16	1.0	1.8	22.3	1.15	80	880

3x1.5+1.5	0.8	1.8	13.1	12.1	18.5	230
3x2.5+2.5	0.8	1.8	14.2	7.4	25.0	290
3 x4 + 4	1.0	1.8	16.3	4.6	32.0	400
3 x 6 + 6	1.0	1.8	17.5	3.1	41.0	505
3 x10+10	1.0	1.8	21.0	1.8	57.5	770
3 x16+16	1.0	1.8	23.5	1.15	75	1050
3 x25+16	1.2	1.8	26.8	0.727/1.15	100	1450
3 x25+25	1.2	1.8	27.5	0.727	100	1615
3 x35+16	1.2	1.9	28.7	0.524/1.15	132	1720
3 x35+35	1.2	1.9	30.2	0.524	132	2060
3 x50+25	1.4	1.9	29.2	0.387/0.727	160	2100
3 x50+50	1.4	1.9	30	0.387	160	2300
3 x70+35	1.4	2.0	32.6	0.268/0.524	202	2850
3 x70+70	1.4	2.0	34	0.268	202	3200
3 x95+50	1.6	2.1	37.8	0.193/0.387	249	3900
3 x95+95	1.6	2.1	38.4	0.193	249	4290
3x120+70	1.6	2.2	41	0.153/0.268	289	4750
3x120+120	1.6	2.2	41.2	0.153	289	5250
3x150+70	1.8	2.3	44.5	0.124/0.268	329	5900
3x150+150	1.8	2.3	45	0.124	329	6600
3x185+95	2.0	2.4	49.0	0.0991/0.193	377	7320
3x240+120	2.2	2.6	55.0	0.0754/0.153	443	9460



## Power cable NYCY (with concentric copper conductor) 0.6/1 KV

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYCY



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :**  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :**  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz :** 4 KV

### Cable structure :

- Cu / PVC / PVC / Cu / PVC
- Copper conductor  
class1 or 2 acc. to IEC 60228
- Insulation PVC/A
- Concentric conductor in inner layer of round copper wires , outer layer with copper tape.
- Sheath PVC/ST2 90°C

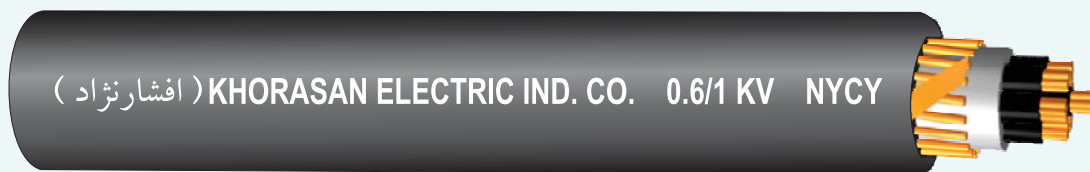
### Application :

- Power cables for energy supply are used for industry and distribution boards , power stations and house connecting boxes. Overall, where increased electrical are required.
- These cables are installed in underground, in water, indoors and in cable ducts .
- The concentric conductor (c) is allowed to use an neutral, protective or earthed conductor.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
4x1.5+1.5	0.8	1.8	14.0	12.1	18.5	262
4x2.5+2.5	0.8	1.8	15.1	7.41	25	340
4 x 4 + 4	1.0	1.8	17.1	4.61	33	470
4 x 6 + 6	1.0	1.8	18.6	3.08	42	590
4 x10+10	1.0	1.8	22.0	1.83	57	890
4 x16+16	1.0	1.8	25.0	1.15	75	1300
5x1.5+1.5	0.8	1.8	14.9	12.1	14.5	300
5x2.5+2.5	0.8	1.8	16.0	7.41	19.5	400
5 x 4 + 4	1.0	1.8	18.5	4.61	25.5	550
5 x 6 + 6	1.0	1.8	20.5	3.08	33	708
5 x10+10	1.0	1.8	23	1.83	45	1000
5 x16+16	1.0	1.8	27	1.15	60	1500
7 x 4 + 4	1.0	1.8	20	4.61	22	630
7 x 6 + 6	1.0	1.8	22	3.08	28.5	795



## Control cable NYCY (with concentric copper conductor) 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / PVC / PVC
- Copper conductor  
class1 & 2 acc. to IEC 60228
- Insulation PVC/A
- Sheath PVC/ST2 90°C

### Application :

- As control and connecting cable in machines , conveyor belts ,production lines ,machine tool industries , progressive assembly lines , automatic handling apparatus for medium mechanical stress and for fixed installation but not suitable for open air.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
7x1.5+1.5	0.8	1.8	15.6	12.1/12.1	12.6	345
7x1.5+2.5	0.8	1.8	15.8	12.1/7.41	12.6	360
8x1.5+1.5	0.8	1.8	16.0	12.1/12.1	11.7	380
8x1.5+2.5	0.8	1.8	16.3	12.1/7.41	11.7	390
10x1.5+2.5	0.8	1.8	18.5	12.1/7.41	10.7	475
12x1.5+2.5	0.8	1.8	19.0	12.1/7.41	10.1	530
14x1.5+2.5	0.8	1.8	19.7	12.1/7.41	9.7	582
16x1.5+4	0.8	1.8	20.8	12.1/4.61	9.1	650
19x1.5+4	0.8	1.8	22.0	12.1/4.61	8.7	735
21x1.5+6	0.8	1.8	23.0	12.1/3.08	8.3	810
24x1.5+6	0.8	1.8	25.4	12.1/3.08	7.8	985
30x1.5+6	0.8	1.8	27.0	12.1/3.08	7.2	1135
40x1.5+10	0.8	1.9	30.0	12.1/1.83	6.7	1415
52x1.5+10	0.8	2.0	32.5	12.1/1.83	6.2	1750
61x1.5+10	0.8	2.1	35.0	12.1/1.83	5.8	2050

7x2.5+2.5	0.8	1.8	17.0	7.41/7.41	16.9	450
8x2.5+2.5	0.8	1.8	18.0	7.41/7.41	15.6	490
10x2.5+4	0.8	1.8	20.5	7.41/4.61	14.3	675
12x2.5+4	0.8	1.8	21.0	7.41/4.61	13.5	735
14x2.5+4	0.8	1.8	22.0	7.41/4.61	13	810
14x2.5+6	0.8	1.8	22.4	7.41/3.08	13	855
16x2.5+6	0.8	1.8	23.0	7.41/3.08	12.7	920
19x2.5+6	0.8	1.8	24.5	7.41/3.08	11.7	1100
21x2.5+10	0.8	1.8	26.0	7.41/1.83	11.4	1190
24x2.5+10	0.8	1.8	28.3	7.41/1.83	10.4	1400
30x2.5+10	0.8	1.9	30.0	7.41/1.83	9.6	1625
40x2.5+10	0.8	2.0	33.5	7.41/1.83	9.1	2020
52x2.5+10	0.8	2.1	37.2	7.41/1.83	8.3	2530
61x2.5+10	0.8	2.2	39.3	7.41/1.83	7.8	2810





# Power cable NYCYRY (wire armoured with concentric conductor)

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYCYRY

## Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

## Cable structure :

- Cu /PVC /PVC /Cu /PVC /SWA /PVC
- Copper conductor  
class1 & 2 acc. to IEC 60228
- Insulation PVC/A
- Concentric conductor in inner layer of round copper wires ,outer layer with copper tape.
- Galvanised steel or aluminium wire armoured.
- Sheath PVC/ST2 90°C

## Application :

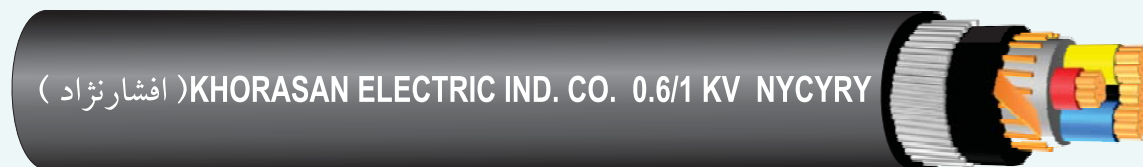
- Power cables for energy supply are used for industry and distribution boards , power stations and house connecting boxes. Overall , where increased electrical and mechanical protection are required. Those cables are installed in underground ,in water, indoors and in cable ducts. The concentric conductor (c) is allowed to use an neutral, protective or earthed conductor. For single core cables aluminum armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour φmm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2x1.5+1.5	0.8	1.25	1.8	18.0	12.1/12.1	19.5	625
2x2.5+2.5	0.8	1.25	1.8	19.0	7.41/7.41	26	710
2 x 4 + 4	1.0	1.25	1.8	21.0	4.61/4.61	34	870
2 x 6 + 6	1.0	1.25	1.8	21.7	3.08/3.08	44	970
2x10+10	1.0	1.6	1.8	25.0	1.83/1.83	60	1360
2x16+16	1.0	1.6	1.8	28.4	1.15/1.15	80	1770

3x1.5+1.5	0.8	1.25	1.8	18.5	12.1/12.1	19.5	661
3x2.5+2.5	0.8	1.25	1.8	19.5	7.41/7.41	26	760
3 x 4 + 4	1.0	1.25	1.8	21.5	4.61/4.61	34	935
3 x 6 + 6	1.0	1.6	1.8	23.1	3.08/3.08	44	1200
3x10+10	1.0	1.6	1.8	25.5	1.83/1.83	60	1490
3x16+16	1.0	1.6	1.9	30.0	1.15/1.15	80	1985
3x25+16	1.2	2.0	2.0	34.0	0.727/1.15	108	2770
3x25+25	1.2	2.0	2.1	35.0	0.727/0.727	108	2910
3x35+16	1.2	2.0	2.1	36.0	0.524/1.15	132	3110
3x35+35	1.2	2.0	2.1	37.5	0.524/0.524	132	3380
3x50+25	1.4	2.0	2.1	37.5	0.387/0.727	160	3450
3x50+50	1.4	2.0	2.1	39	0.387/0.387	160	3750
3x70+35	1.4	2.0	2.2	41	0.268/0.524	202	4350
3x70+70	1.4	2.0	2.3	43	0.268/0.268	202	4800
3x95+50	1.6	2.0	2.3	46	0.193/0.387	249	5600
3x95+95	1.6	2.0	2.3	46.2	0.193/0.193	249	6000
3 x 120+70	1.6	2.5	2.4	49	0.153/0.268	289	7000
3x120+120	1.6	2.5	2.5	50.5	0.153/0.153	289	7550
3 x 150+70	1.8	2.5	2.6	55	0.124/0.268	329	8250
3x150+150	1.8	2.5	2.6	56	0.124/0.124	329	9000
3 x 185+95	2.0	2.5	2.7	59.0	0.0991/0.193	377	9850
3x240+120	2.2	2.5	2.9	65.0	0.0754/0.153	443	12220



## Power cable NYCYRY (wire armoured with concentric conductor)



### Technical data :

- Power cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu /PVC /PVC /Cu /PVC /SWA /PVC
- Copper conductor  
class1 & 2 acc. to IEC 60228
- Insulation PVC/A
- Concentric conductor in inner layer of round copper wires ,outer layer with copper tape.
- Galvanised steel or aluminium wire armoured.
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are used for industry and distribution boards , power stations and house connecting boxes. Overall , where increased electrical and mechanical protection are required. Those cables are installed in underground ,in water, indoors and in cable ducts. The concentric conductor (c) is allowed to use an neutral, protective or earthed conductor. For single core cables aluminum armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour φmm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
4x1.5+1.5	0.8	1.25	1.8	19.2	12.1	19.5	720
4x2.5+2.5	0.8	1.25	1.8	20.5	7.41	26	840
4 x 4 + 4	1.0	1.6	1.8	23.3	4.61	34	1170
4 x 6 + 6	1.0	1.6	1.8	25.0	3.08	44	1350
4x10+10	1.0	1.6	1.8	27.5	1.83	60	1690
4x16+16	1.0	1.6	1.9	31.5	1.15	80	2250
5x1.5+1.5	0.8	1.25	1.8	20.0	12.1	14.6	790
5x2.5+2.5	0.8	1.25	1.8	21.5	7.41	19.5	910
5 x 4 + 4	1.0	1.6	1.8	25.0	4.61	25.5	1280
5 x 6 + 6	1.0	1.6	1.8	26.4	3.08	33	1500
5x10+10	1.0	1.6	1.9	29	1.83	45	1900
5x16+16	1.0	2.0	2.0	34.7	1.15	60	2800
7 x 4 + 4	1.0	1.6	1.8	26	4.61	22.1	1400
7 x 6 + 6	1.0	1.6	1.8	28	3.08	28.6	1670



## Control cable NYCYRY (wire armoured with concentric conductor) 0.6/1 KV



( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV NYCYRY

### Technical data :

- Control cable according to IEC 60502-1 , DIN VDE 0271 and ISIRI 3569
- Temperature range :  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu /PVC /PVC /Cu /PVC /SWA /PVC
- Copper conductor  
class1 & 2 acc. to IEC 60228
- Insulation PVC/A
- Concentric conductor in inner layer of copper wires ,outer layer with copper tape.
- Galvanised steel or aluminium wire armoured.
- Sheath PVC/ST2 90°C

### Application :

- As control and connecting cable in machines ,conveyor belts , production lines , machine tool industries , progressive assembly lines , automatic handling apparatus where increased electrical and mechanical protection are required.
- The copper screening assures a disturbance-free data and signal transmission for measuring and control systems.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour φmm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
7x1.5 +1.5	0.8	1.25	1.8	21.0	12.1/12.1	12.6	900
7x1.5 +2.5	0.8	1.25	1.8	21.3	12.1/7.41	12.6	920
8x1.5 +2.5	0.8	1.6	1.8	22.7	12.1/7.41	11.7	1110
10x1.5+2.5	0.8	1.6	1.8	25.0	12.1/7.41	10.7	1320
12x1.5+2.5	0.8	1.6	1.8	25.5	12.1/7.41	10.1	1390
14x1.5+2.5	0.8	1.6	1.8	26.0	12.1/7.41	9.7	1450
16x1.5 + 4	0.8	1.6	1.8	27.0	12.1/4.61	9.1	1550
19x1.5 + 4	0.8	1.6	1.8	28.0	12.1/4.61	8.7	1700
21x1.5 + 6	0.8	1.6	1.9	29.5	12.1/3.08	8.3	1780
24x1.5 + 6	0.8	1.6	1.9	31.7	12.1/3.08	7.8	2050
30x1.5 + 6	0.8	1.6	2.0	33.0	12.1/3.08	7.2	2250
40x1.5+10	0.8	2.0	2.1	37.0	12.1/1.83	6.7	2950
52x1.5+10	0.8	2.0	2.2	40.5	12.1/1.83	6.2	3450
61x1.5+10	0.8	2.0	2.3	43.0	12.1/1.83	5.8	3850

7x2.5+2.5	0.8	1.6	1.8	23.0	7.41/7.41	16.9	1260
8x2.5+2.5	0.8	1.6	1.8	24.3	7.41/7.41	15.6	1300
10x2.5 +4	0.8	1.6	1.8	27.0	7.41/4.61	14.3	1550
12x2.5 +4	0.8	1.6	1.8	27.5	7.41/4.61	13.5	1660
14x2.5 +4	0.8	1.6	1.8	28.2	7.41/4.61	13	1760
14x2.5 +6	0.8	1.6	1.8	28.5	7.41/3.08	13	1780
16x2.5 +6	0.8	1.6	1.9	30.0	7.41/3.08	12.2	1920
19x2.5 +6	0.8	1.6	1.9	31.0	7.41/3.08	11.7	2070
21x2.5+10	0.8	1.6	2.0	32.8	7.41/1.83	11.4	2300
24x2.5+10	0.8	2.0	2.1	36.0	7.41/1.83	10.4	2810
30x2.5+10	0.8	2.0	2.1	37.5	7.41/1.83	9.6	3110
40x2.5+10	0.8	2.0	2.2	41.0	7.41/1.83	9.1	3520
52x2.5+10	0.8	2.0	2.4	45.0	7.41/1.83	8.3	4330
61x2.5+10	0.8	2.5	2.5	48.5	7.41/1.83	7.8	5220



## Light PVC flat cable with protective conductor 300/500 V

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 300/500 V



### Technical data :

- PVC insulated, PVC sheathed flat cables with circuit protective conductor as BS 6004
- Nominal voltage :  $U_n/U=300/500$  V
- Colors for core identification :  
**Single** : red or black  
**Twin** : red and black  
**3-Core** :red ,yellow(center core) and blue

### Cable structure :

- Cu / PVC / PVC
- Plain annealed copper conductor class 1 or 2 as IEC 60228
- PVC insulation type TI 1
- Parallel circuit protective bare conductor
- sheath :gray or white PVC  
 (with two cores, the earth conductor is placed between black and red cores and for three cores the earth is placed between blue and yellow cores)

### Application :

- These cables are used in internal wiring for power and lighting .
- Permanent installation can be under and over and also within plaster.
- Laying in the ground is not permissible .

No. cores xNominal cross section mm <sup>2</sup>	Class of conductors	Insulation thickness mm	Sheath thickness mm	Overall dimensions mm	Approx. weight kg/km	Current capacity (A) in air 30°C
1x1.0+1.0	1	0.6	0.9	4.1x5.3	40	25
1x1.5+1.0	1	0.7	0.9	4.6x5.7	49	40
2x1.0+1.0	1	0.6	0.9	4.2x7.6	68	16
2x1.5+1.0	1	0.7	0.9	4.6x8.5	85	25
2x2.5+1.5	1	0.8	1.0	5.4x9.9	127	35
2x4+1.5	2	0.8	1.0	5.6x11.7	170	45
2x6+2.5	2	0.8	1.1	7.0x13.5	235	56
2x10+4	2	1.0	1.2	8.5x17.1	382	75
2x16+6	2	1.0	1.3	9.7x20	545	100
3x1.0+1.0	1	0.6	0.9	4.2x10.5	90	16
3x1.5+1.0	1	0.7	0.9	4.6x11.5	115	25
3x2.5+1.0	1	0.8	1.0	5.4x13.6	171	35
3x4+1.5	2	0.8	1.1	6.4x16.3	241	45
3x6+2.5	2	0.8	1.1	7x18.5	325	56
3x10+4	2	1.0	1.2	8.5x23.5	525	75
3x16+6	2	1.0	1.3	9.7x27.5	762	100



## Power cable N2XY (with XLPE insulation) 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271, BS 5467 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / XLPE / PVC
- Copper conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply  
are installed in underground , in  
water , indoors , in cable ducts ,  
power stations , for industry and  
distribution boards as well as in  
subscriber networks .

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x 4	0.7	1.4	6.5	4.61	60	77
1 x 6	0.7	1.4	7.0	3.08	75	100
1 x 10	0.7	1.4	7.9	1.83	96	140
1 x 16	0.7	1.4	9.5	1.15	128	210
1 x 25	0.9	1.4	11.2	0.727	173	315
1 x 35	0.9	1.4	12.0	0.524	212	390
1 x 50	1.0	1.4	13.2	0.387	258	520
1 x 70	1.1	1.4	15.2	0.268	328	720
1 x 95	1.1	1.5	17.1	0.193	404	980
1 x120	1.2	1.6	19.3	0.153	471	1230
1 x150	1.4	1.6	21.0	0.124	541	1500
1 x185	1.6	1.7	23.4	0.0991	626	1880
1 x240	1.7	1.8	26.5	0.0754	750	2440
1 x300	1.8	1.9	28.8	0.0601	864	3050
1 x400	2.0	2.0	32.5	0.047	1020	3850
1 x500	2.2	2.1	36.0	0.0366	1173	4950

2 x1.5	0.7	1.8	11.5	12.1	24	170
2 x2.5	0.7	1.8	12.2	7.41	32	210
2 x 4	0.7	1.8	13.2	4.61	42	260
2 x 6	0.7	1.8	14.1	3.08	53	320
2 x10	0.7	1.8	16.0	1.83	73	440
2 x16	0.7	1.8	19.0	1.15	96	640
2 x25	0.9	1.8	22.5	0.727	130	940

3x1.5re	0.7	1.8	11.8	12.1	24	190
3x2.5re	0.7	1.8	12.7	7.41	32	240
3 x 4 re	0.7	1.8	13.7	4.61	42	305
3 x 6 re	0.7	1.8	14.8	3.08	53	380
3 x 10rm	0.7	1.8	16.6	1.83	73	535
3 x 16rm	0.7	1.8	19.8	1.15	96	790
3 x 25rm	0.9	1.8	23.7	0.727	130	1170
3 x 35rm	0.9	1.8	25.5	0.524	160	1430
3 x 50sm	1.0	1.8	26.0	0.387	195	1600
3 x 70sm	1.1	1.8	28.5	0.268	247	2250
3 x 95sm	1.1	1.9	31.5	0.193	305	3200
3x120sm	1.2	2.0	36.0	0.153	355	3950
3x150sm	1.4	2.1	38.0	0.124	407	4860
3x185sm	1.6	2.2	41.0	0.0991	469	6050
3x240sm	1.7	2.3	47.0	0.0754	551	8020
3x300sm	1.8	2.6	55.0	0.0601	638	10030



## Power cable N2XY (with XLPE insulation) 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271, BS 5467 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / XLPE / PVC
- Copper conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply  
are installed in underground , in  
water , indoors , in cable ducts ,  
power stations , for industry and  
distribution boards as well as in  
subscriber networks .

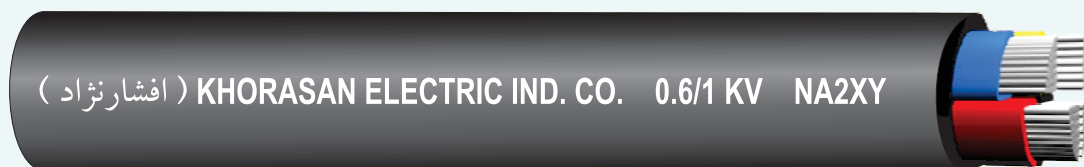
No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
3 x 25/16	0.9/0.7	1.8	25.0	0.727/1.15	130	1280
3 x 35/16	0.9/0.7	1.8	27.0	0.524/1.15	160	1590
3 x 50/25	1.0/0.9	1.8	27.5	0.387/0.727	195	1830
3 x 70/35	1.1/0.9	1.9	31.0	0.268/0.524	247	2540
3 x 95/50	1.1/1.0	2.0	35.3	0.193/0.387	305	3452
3 x 120/70	1.2/1.1	2.1	38.2	0.153/0.268	355	4385
3 x 150/70	1.4/1.1	2.3	42.5	0.124/0.268	407	5250
3 x 185/95	1.6/1.1	2.4	47.0	0.0991/0.193	469	6640
3x240/120	1.7/1.2	2.6	53.0	0.0754/0.153	551	8580
3x300/150	1.8/1.4	2.8	58.3	0.0601/0.124	638	10700

4 x 1.5re	0.7	1.8	12.5	12.1	24	220
4 x 2.5re	0.7	1.8	13.5	7.41	32	275
4 x 4 re	0.7	1.8	14.6	4.61	42	350
4 x 6 re	0.7	1.8	15.8	3.08	53	450
4 x 10 rm	0.7	1.8	17.8	1.83	73	640
4 x 16 rm	0.7	1.8	21.5	1.15	96	960
4 x 25 rm	0.9	1.8	25.7	0.727	130	1490
4 x 35 rm	0.9	1.8	27.6	0.524	160	1850
4 x 50sm	1.0	1.8	28.5	0.387	195	2000
4 x 70sm	1.1	2.0	33.0	0.268	247	2820
4 x 95sm	1.1	2.1	37.0	0.193	305	3920
4x120sm	1.2	2.2	40.5	0.153	355	4860
4x150sm	1.4	2.3	44.8	0.124	407	6030
4x185sm	1.6	2.5	49.0	0.0991	469	7450
4x240sm	1.7	2.6	55	0.0754	551	9740

5 x 1.5	0.7	1.8	13.3	12.1	18	250
5 x 2.5	0.7	1.8	14.3	7.41	24	315
5 x 4	0.7	1.8	15.7	4.61	31.5	410
5 x 6	0.7	1.8	17.0	3.08	40	530
5 x 10	0.7	1.8	19.3	1.83	55	760
5 x 16	0.7	1.8	23.5	1.15	72	1160
5 x 25	0.9	1.8	28.2	0.727	98	1790
5 x 35	0.9	1.9	30.8	0.524	120	2230
5 x 50	1.0	2.1	35.1	0.387	146	3020



## Power cable NA2XY (Aluminium conductor with XLPE insulation) 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- AL / XLPE / PVC
- Aluminium conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations , for industry and distribution boards as well as in subscriber networks .

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x 16	0.7	1.4	9.6	1.91	70	117
1 x 25	0.9	1.4	11.3	1.20	120	162
1 x 35	0.9	1.4	12.4	0.868	163	200
1 x 50	1.0	1.4	14.0	0.641	200	263
1 x 70	1.1	1.4	16.0	0.443	254	347
1 x 95	1.1	1.5	18.0	0.320	313	442
1 x 120	1.2	1.6	19.7	0.253	366	553
1 x 150	1.4	1.6	21.9	0.206	420	666
1 x 185	1.6	1.7	24.2	0.164	486	841
1 x 240	1.7	1.8	27.0	0.125	585	1039
1 x 300	1.8	1.9	29.6	0.100	675	1311
1 x 400	2.0	2.0	33.2	0.0778	798	1602
1 x 500	2.2	2.1	36.8	0.0605	926	2050

3 x 50sm	1.0	1.8	26.0	0.641	147	715
3 x 70sm	1.1	1.8	28.0	0.443	189	970
3 x 95sm	1.1	1.9	31.0	0.320	232	1250
3x120sm	1.2	2.0	36.0	0.253	270	1540
3x150sm	1.4	2.1	38.0	0.206	308	1865
3x185sm	1.6	2.2	41.0	0.164	357	2332
3x240sm	1.7	2.3	47.0	0.125	435	2975
3x300sm	1.8	2.6	55.0	0.100	501	3666

3 x 50/25	1.0/0.9	1.8	27.0	0.641/1.20	147	873
3 x 70/35	1.1/0.9	1.9	30.8	0.443/0.868	189	1200
3 x 95/50	1.1/1.0	2.0	35.0	0.320/0.641	232	1522
3x120/70	1.2/1.1	2.1	38.0	0.253/0.443	270	1915
3x150/70	1.4/1.1	2.3	42.1	0.206/0.443	308	2280
3x185/95	1.6/1.1	2.4	46.8	0.164/0.320	357	2875
3x240/120	1.7/1.2	2.6	52.5	0.125/0.253	435	3664
3x300/150	1.8/1.4	2.8	58.0	0.100/0.206	501	4452

4 x 50sm	1.0	1.8	28.0	0.641	147	953
4 x 70sm	1.1	2.0	33.0	0.443	189	1258
4 x 95sm	1.1	2.1	37.0	0.320	232	1653
4x120sm	1.2	2.2	40.0	0.253	270	2075
4x150sm	1.4	2.3	44.2	0.206	308	2511
4x185sm	1.6	2.5	49.0	0.164	357	3136
4x240sm	1.7	2.6	55.0	0.125	435	4016
4x300sm	1.8	2.8	60.0	0.100	501	4942



## Power cable NA2XBY

(Aluminium conductor with XLPE insulation and tape armour) 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- AL / XLPE / PVC / DTA / PVC
- Aluminium conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Double tape Galvanised steel armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations , for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected , for better mechanical protection armoured cables are used.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Tape Armour thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
3 x 50sm	1.0	0.2	1.8	27.0	0.641	147	1000
3 x 70sm	1.1	0.2	1.9	30.4	0.443	189	1210
3 x 95sm	1.1	0.2	2.0	34.2	0.320	232	1650
3x120sm	1.2	0.2	2.1	38.0	0.253	270	2250
3x150sm	1.4	0.5	2.2	41.0	0.206	308	2770
3x185sm	1.6	0.5	2.3	45.0	0.164	357	3350
3x240sm	1.7	0.5	2.5	51.0	0.125	435	4280
3x300sm	1.8	0.5	2.8	59.0	0.100	501	5020

3 x 50/25	1.0/0.9	0.2	1.9	31.0	0.641/1.20	147	1200
3 x 70/35	1.1/0.9	0.2	2.0	34.0	0.443/0.868	189	1550
3 x 95/50	1.1/1.0	0.5	2.2	40.0	0.320/0.641	232	1970
3 x 120/70	1.2/1.1	0.5	2.3	43.0	0.253/0.443	270	2410
3 x 150/70	1.4/1.1	0.5	2.4	47.0	0.206/0.443	308	3290
3 x 185/95	1.6/1.1	0.5	2.5	51.2	0.164/0.320	357	3980
3x240/120	1.7/1.2	0.5	2.7	58.0	0.125/0.253	435	4910
3x300/150	1.8/1.4	0.5	2.9	63.0	0.100/0.206	501	5920

4 x 50sm	1.0	0.2	1.9	32.0	0.641	147	1290
4 x 70sm	1.1	0.2	2.1	37.0	0.443	189	1750
4 x 95sm	1.1	0.5	2.2	41.0	0.320	232	2540
4x120sm	1.2	0.5	2.3	44.5	0.253	270	3020
4x150sm	1.4	0.5	2.5	49.0	0.206	308	3670
4x185sm	1.6	0.5	2.6	53.6	0.164	357	4380
4x240sm	1.7	0.5	2.8	60.0	0.125	435	5430
4x300sm	1.8	0.5	3.0	65.0	0.100	501	6510





## Power cable N2XRY (wire armoured with XLPE insulation) 0.6/1 KV

( افشارنژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV N2XRY

### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271, BS 5467 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / XLPE / PVC / SWA / PVC
- Copper conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Galvanised steel or aluminium wire armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations ,for industry and distribution boards as well as in subscriber networks .
- where mechanical damages are not to be expected, for better mechanical protection armoured cables are used.
- For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour φmm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x 4	0.7	0.9	1.8	12.0	4.61	60	207
1 x 6	0.7	0.9	1.8	12.5	3.08	75	236
1 x 10	0.7	0.9	1.8	13.3	1.83	95	290
1 x 16	0.7	0.9	1.8	14.8	1.15	128	385
1 x 25	0.9	1.25	1.8	17.2	0.727	173	550
1 x 35	0.9	1.25	1.8	18.0	0.524	212	640
1 x 50	1.0	1.25	1.8	19.3	0.387	258	790
1 x 70	1.1	1.25	1.8	21.3	0.268	328	1020
1 x 95	1.1	1.6	1.8	23.7	0.193	404	1350
1 x 120	1.2	1.6	1.8	25.7	0.153	471	1630
1 x 150	1.4	1.6	1.8	27.3	0.124	541	1920
1 x 185	1.6	1.6	1.9	29.7	0.0991	626	2330
1 x 240	1.7	1.6	2.0	32.6	0.0754	750	2960
1 x 300	1.8	2.0	2.1	35.8	0.0601	864	3680
1 x 400	2.0	2.0	2.2	39.5	0.0470	1020	4550
1 x 500	2.2	2.0	2.3	43.0	0.0366	1173	5690

Approx. weights for single core cables are basis of aluminium wire armouring  
Available armouring with galvanised steel on request (for D.C systems)

2 x1.5	0.7	0.9	1.8	13.9	12.1	24	360
2 x2.5	0.7	0.9	1.8	14.7	7.41	32	610
2 x 4	0.7	0.9	1.8	15.7	4.61	42	480
2 x 6	0.7	1.25	1.8	17.3	3.08	53	650
2 x10	0.7	1.25	1.8	19.0	1.83	73	810
2 x16	0.7	1.6	1.8	22.8	1.15	96	1220
2 x25	0.9	1.6	1.8	26.2	0.727	130	1625

3 x 1.5re	0.7	0.9	1.8	14.3	12.1	24	390
3 x 2.5re	0.7	0.9	1.8	15.2	7.41	32	450
3 x 4 re	0.7	1.25	1.8	16.9	4.61	42	624
3 x 6 re	0.7	1.25	1.8	18.0	3.08	53	730
3 x 10rm	0.7	1.25	1.8	20.8	1.83	73	990
3 x 16rm	0.7	1.6	1.8	23.8	1.15	96	1400
3 x 25rm	0.9	1.6	1.8	27.5	0.727	130	1890
3 x 35rm	0.9	1.6	1.9	29.3	0.524	160	2300
3 x 50sm	1.0	1.6	1.9	30.0	0.387	195	2510
3 x 70sm	1.1	1.6	2.0	32.5	0.268	247	3250
3 x 95sm	1.1	2.0	2.1	38.0	0.193	305	4390
3x120sm	1.2	2.0	2.2	41.0	0.153	355	5250
3x150sm	1.4	2.0	2.3	44.0	0.124	407	6400
3x185sm	1.6	2.5	2.4	49.0	0.0991	469	8020
3x240sm	1.7	2.5	2.6	53.7	0.0754	551	10150
3x300sm	1.8	2.5	2.9	64.0	0.0601	638	12350



## Power cable N2XRY (wire armoured with XLPE insulation) 0.6/1 KV

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV N2XRY

### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271, BS 5467 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / XLPE / PVC / SWA / PVC
- Copper conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Galvanised steel or aluminium wire armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations ,for industry and distribution boards as well as in subscriber networks .
- where mechanical damages are not to be expected, for better mechanical protection armoured cables are used.
- For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Wire Armour φmm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
3 x 25/16	0.9/0.7	1.6	1.9	31.0	0.727/1.15	130	2080
3 x 35/16	0.9/0.7	1.6	1.9	32.5	0.524/1.15	160	2450
3 x 50/25	1.0/0.9	1.6	2.0	34.2	0.387/0.727	195	2860
3 x 70/35	1.1/0.9	2.0	2.1	38.0	0.268/0.524	247	3890
3 x 95/50	1.1/1.0	2.0	2.2	42.5	0.193/0.387	305	4950
3 x120/70	1.2/1.1	2.0	2.3	45.5	0.153/0.268	355	5600
3 x150/70	1.4/1.1	2.5	2.5	51.0	0.124/0.268	407	7520
3 x185/95	1.6/1.1	2.5	2.7	56.0	0.0991/0.193	469	9100
3x240/120	1.7/1.2	2.5	2.9	62.0	0.0757/0.153	551	11450
3x300/150	1.8/1.4	2.5	3.0	67.0	0.0601/0.124	638	13800

4 x1.5 re	0.7	0.9	1.8	15.0	12.1	24	430
4 x2.5 re	0.7	0.9	1.8	16.0	7.41	32	500
4 x 4 re	0.7	1.25	1.8	17.8	4.61	42	700
4 x 6 re	0.7	1.25	1.8	19.0	3.08	53	830
4 x 10 rm	0.7	1.6	1.8	22.8	1.83	73	1270
4 x 16 rm	0.7	1.6	1.8	25.4	1.15	96	1630
4 x 25 rm	0.9	1.6	1.9	30.0	0.727	130	2247
4 x 35 rm	0.9	1.6	2.0	31.9	0.524	160	2800
4 x 50 sm	1.0	2.0	2.0	35.5	0.387	195	3300
4 x 70 sm	1.1	2.0	2.2	40.5	0.268	247	4300
4 x 95 sm	1.1	2.0	2.3	44.5	0.193	305	5450
4x120 sm	1.2	2.5	2.4	49.0	0.153	355	7100
4x150 sm	1.4	2.5	2.6	53.0	0.124	407	8460
4x185 sm	1.6	2.5	2.7	57.5	0.0991	469	10130
4x240 sm	1.7	2.5	2.9	63.7	0.0754	551	13020
4x300 sm	1.8	2.5	3.1	70.0	0.0601	638	15500

5 x 1.5	0.7	0.9	1.8	15.8	12.1	18	475
5 x 2.5	0.7	1.25	1.8	17.7	7.41	24	660
5 x 4	0.7	1.25	1.8	18.9	4.61	31.5	785
5 x 6	0.7	1.25	1.8	20.3	3.08	40	935
5 x 10	0.7	1.6	1.8	24.5	1.83	55	1445
5 x 16	0.7	1.6	1.8	27.5	1.15	72	1880
5 x 25	0.9	1.6	2.0	32.5	0.727	98	2630
5 x 35	0.9	2.0	2.1	35.8	0.524	120	3360

Approx. weights for multi core cables are basis of galvanised steel wire armouring



## Power cable N2XBY (tape armoured with XLPE insulation) 0.6/1 KV



### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / XLPE / PVC / DTA / PVC
- Copper conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Double tape Galvanised steel armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations , for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected , for better mechanical protection armoured cables are used. For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Tape Armour thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x 10	0.7	0.5	1.8	12.7	1.83	96	285
1 x 16	0.7	0.5	1.8	14.2	1.15	128	375
1 x 25	0.9	0.5	1.8	16.0	0.727	173	500
1 x 35	0.9	0.5	1.8	17.0	0.524	212	590
1 x 50	1.0	0.5	1.8	18.2	0.387	258	740
1 x 70	1.1	0.5	1.8	20.0	0.268	328	965
1 x 95	1.1	0.5	1.8	21.8	0.193	404	1240
1 x120	1.2	0.5	1.8	23.8	0.153	471	1520
1 x150	1.4	0.5	1.8	25.5	0.124	541	1820
1 x185	1.6	0.5	1.8	27.7	0.0991	626	2200
1 x240	1.7	0.5	1.9	30.6	0.0754	750	2820
1 x300	1.8	0.5	2.0	33.2	0.0601	864	3470
1 x400	2.0	0.5	2.1	36.7	0.0470	1020	4350
1 x500	2.2	0.5	2.2	40.5	0.0366	1173	5500

Approx. weights for single core cables are basis of aluminium tape armouring  
Available armouring with galvanised steel on request (for D.C systems)

2x1.5	0.7	0.2	1.8	12.6	12.1	24	252
2x2.5	0.7	0.2	1.8	13.3	7.41	32	300
2 x 4	0.7	0.2	1.8	14.2	4.61	42	360
2 x 6	0.7	0.2	1.8	15.2	3.08	53	430
2 x10	0.7	0.2	1.8	17.0	1.83	73	555
2 x16	0.7	0.2	1.8	20.0	1.15	96	795
2 x25	0.9	0.2	1.8	23.5	0.727	130	1120

3x1.5 re	0.7	0.2	1.8	13.0	12.1	24	285
3x2.5 re	0.7	0.2	1.8	13.8	7.41	32	335
3 x 4 re	0.7	0.2	1.8	14.8	4.61	42	410
3 x 6 re	0.7	0.2	1.8	15.9	3.08	53	500
3 x10 rm	0.7	0.2	1.8	17.6	1.83	73	660
3 x16 rm	0.7	0.2	1.8	21.0	1.15	96	950
3 x25 rm	0.9	0.2	1.8	24.8	0.727	130	1350
3 x35 rm	0.9	0.2	1.8	26.4	0.524	160	1640
3 x50 sm	1.0	0.2	1.8	27.2	0.387	195	1850
3 x70 sm	1.1	0.2	1.9	31.2	0.268	247	2540
3 x95 sm	1.1	0.2	2.0	34.0	0.193	305	3420
3x120 sm	1.2	0.2	2.1	37.0	0.153	355	4300
3x150 sm	1.4	0.5	2.2	41.0	0.124	407	5500
3x185 sm	1.6	0.5	2.3	44.8	0.0991	469	6800
3x240 sm	1.7	0.5	2.5	50.0	0.0754	551	8700
3x300 sm	1.8	0.5	2.8	60.0	0.0601	638	10630

Approx. weights for multi core cables are basis of galvanised steel tape armouring



## Power cable N2XBY (tape armoured with XLPE insulation) 0.6/1 KV



( افشارتراد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV N2XBY

### Technical data :

- Power cable according to IEC 60502-1 ,  
DIN VDE 0271 and ISIRI 3569
- Temperature range :  
during installation up to -5°C
- Operating temperature : max. 90°C
- Short circuit temperature : 250°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / XLPE / PVC / DTA / PVC
- Copper conductor  
class 1 or 2 acc. to IEC 60228
- Insulation XLPE (cross-linked polyethylene)
- Double tape Galvanised steel armoured
- Sheath PVC/ST2 90°C

### Application :

- Power cables for energy supply are installed in underground , in water , indoors , in cable ducts , power stations , for industry and distribution boards as well as in subscriber networks ,where mechanical damages are not to be expected , for better mechanical protection armoured cables are used. For single core cables aluminium armour is recommended.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Tape Armour thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C ( $\Omega$ /KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
3 x 25 / 16	0.9/0.7	0.2	1.8	26.2	0.727/1.15	130	1500
3 x 35 / 16	0.9/0.7	0.2	1.8	28.0	0.524/1.15	160	1850
3 x 50 / 25	1.0/0.9	0.2	1.9	31.0	0.387/0.727	195	2200
3 x 70 / 35	1.1/0.9	0.2	2.0	34.4	0.268/0.524	247	2900
3 x 95 / 50	1.1/1.0	0.5	2.2	39.8	0.193/0.387	305	4200
3 x 120/70	1.2/1.1	0.5	2.3	43.0	0.153/0.268	355	5200
3 x 150/70	1.4/1.1	0.5	2.4	47.2	0.124/0.153	407	6200
3 x 185/95	1.6/1.1	0.5	2.5	50.5	0.0991/0.193	469	7600
3x240/120	1.7/1.2	0.5	2.7	57.7	0.0754/0.153	551	9800
3x300/150	1.8/1.4	0.5	2.9	63.2	0.0601/0.124	638	12050

4x1.5 re	0.7	0.2	1.8	13.5	12.1	24	305
4x2.5 re	0.7	0.2	1.8	14.5	7.41	32	372
4 x 4 re	0.7	0.2	1.8	15.7	4.61	42	460
4 x 6 re	0.7	0.2	1.8	16.9	3.08	53	570
4 x 10 rm	0.7	0.2	1.8	18.9	1.83	73	780
4 x 16 rm	0.7	0.2	1.8	22.8	1.15	96	1135
4 x 25 rm	0.9	0.2	1.8	27.0	0.727	130	1640
4 x 35 rm	0.9	0.2	1.9	28.9	0.524	160	2000
4 x 50 sm	1.0	0.2	1.9	31.8	0.387	195	2400
4 x 70 sm	1.1	0.2	2.1	36.6	0.268	247	3270
4 x 95 sm	1.1	0.5	2.2	41.4	0.193	305	4660
4x120 sm	1.2	0.5	2.3	44.7	0.153	355	5700
4x150 sm	1.4	0.5	2.5	49.3	0.124	407	6980
4x185 sm	1.6	0.5	2.6	53.5	0.0991	469	8520
4x240 sm	1.7	0.5	2.8	59.8	0.0754	551	11000
4x300 sm	1.8	0.5	3.0	65.3	0.0601	638	13500

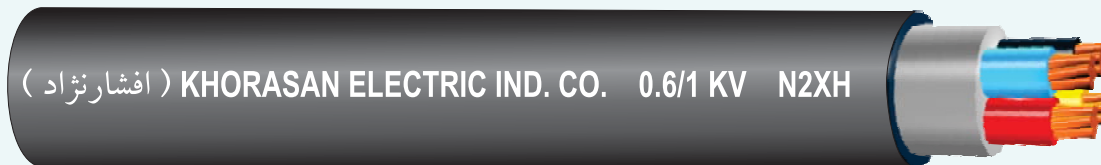
5x1.5	0.7	0.2	1.8	14.4	12.1	18	350
5x2.5	0.7	0.2	1.8	15.5	7.41	24	420
5 x 4	0.7	0.2	1.8	16.8	4.61	31.5	525
5 x 6	0.7	0.2	1.8	18.1	3.08	40	650
5x10	0.7	0.2	1.8	20.5	1.83	55	910
5x16	0.7	0.2	1.8	24.6	1.15	72	1330
5x25	0.9	0.2	1.9	29.5	0.727	98	1950
5x35	0.9	0.2	2.0	32.0	0.524	120	2410

Approx. weights for multi core cables are basis of galvanised steel tape armouring



## Halogen free power cable N2XH 0.6/1 KV

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV N2XH



### Technical data :

- Power cable according to DIN VDE 0276 part 604,hd 604 S1 part 1 and part 5G
- Temperature range :** during installation up to -5°C
- Operating temperature :** max. 90°C
- Short circuit temperature :** 250°C
- Nominal voltage :**  $U_n/U=0.6/1$  KV
- Test voltage a.c. ,50Hz :** 4 KV

### Cable structure :

- Cu/XLPE/Thermoplastic polyolefine
- Copper conductor class1 and 2 acc. to IEC 60228 or VDE 0295
- Halogen free core insulation XLPE (cross-linked polyethylene)
- Overall filled inner sheath, covered by filling compound or wrapped tape
- Outer sheath of thermoplastic polyolefine compound HM4, to HD604 S1, halogen free. (colour black)

### Application :

- Halogen free power cables with enhanced characteristics in case of fire are used for applications where harm to human life and damage to property must be prevented in the event of fire , e.g. in industrial installations ,communal establishments ,hotels ,airports ,under grounds ,railway stations ,hospitals department stores ,banks ,schools theaters ,multi storey buildings ,process control centers and etc.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
1 x 4	0.7	1.8	8.0	4.61	60	85
1 x 6	0.7	1.8	8.5	3.08	75	105
1 x 10	0.7	1.8	10.0	1.83	96	165
1 x 16	0.7	1.8	11.0	1.15	128	205
1 x 25	0.9	1.8	12.2	0.727	173	310
1 x 35	0.9	1.8	13.5	0.524	212	410
1 x 50	1.0	1.8	15.0	0.387	258	600
1 x 70	1.1	1.8	17.0	0.268	328	800
1 x 95	1.1	1.8	19.0	0.193	404	1080
1 x 120	1.2	1.8	21.0	0.153	471	1320
1 x 150	1.4	1.8	22.5	0.124	541	1600
1 x 185	1.6	1.8	24.8	0.0991	626	1950
1 x 240	1.7	1.8	28.0	0.0754	750	2500
1 x 300	1.8	1.9	31.0	0.0601	864	3150

2 x 1.5	0.7	1.8	11.7	12.1	24	165
2 x 2.5	0.7	1.8	12.2	7.41	32	200
2 x 4	0.7	1.8	13.2	4.61	42	270
2 x 6	0.7	1.8	14.0	3.08	53	320
2 x 10	0.7	1.8	16.0	1.83	73	430
2 x 16	0.7	1.8	19.0	1.15	96	635
2 x 25	0.9	1.8	22.5	0.727	130	930

3 x 1.5 re	0.7	1.8	11.8	12.1	24	185
3 x 2.5 re	0.7	1.8	12.7	7.41	32	230
3 x 4 re	0.7	1.8	13.7	4.61	42	280
3 x 6 re	0.7	1.8	14.8	3.08	53	350
3 x 10 rm	0.7	1.8	17.0	1.83	73	525
3 x 16 rm	0.7	1.8	19.8	1.15	96	740
3 x 25 rm	0.9	1.8	23.7	0.727	130	1120
3 x 35 rm	0.9	1.8	25.5	0.524	160	1390
3 x 50 sm	1.0	1.8	25.0	0.387	195	1530
3 x 70 sm	1.1	1.8	28.5	0.268	247	2150
3 x 95 sm	1.1	1.9	31.5	0.193	305	3100
3 x 120sm	1.2	2.0	36.0	0.153	355	3800
3 x 150sm	1.4	2.1	38.0	0.124	407	4700
3 x 180sm	1.6	2.2	41.0	0.0991	469	5900
3 x 240sm	1.7	2.3	47.0	0.0754	551	7800
3 x 300sm	1.8	2.6	55.0	0.0601	638	9700



## Halogen free power cable N2XH 0.6/1 KV

( افشارنژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV N2XH

### Technical data :

- Power cable according to DIN VDE 0276 part 604,hd 604 S1 part 1 and part 5G
- Temperature range :**  
during installation up to -5°C
- Operating temperature :** max. 90°C
- Short circuit temperature :** 250°C
- Nominal voltage :**  $U_n/U=0.6/1$  KV
- Test voltage a.c. ,50Hz :** 4 KV

### Cable structure :

- Cu/XLPE/Thermoplastic polyolefine
- Copper conductor class1 and 2 acc. to IEC 60228 or VDE 0295
- Halogen free core insulation XLPE (cross-linked polyethylene)
- Overall filled inner sheath, covered by filling compound or wrapped tape
- Outer sheath of thermoplastic polyolefine compound HM4, to HD604 S1, halogen free. (colour black)

### Application :

- Halogen free power cables with enhanced characteristics in case of fire are used for applications where harm to human life and damage to property must be prevented in the event of fire , e.g. in industrial installations ,communal establishments ,hotels ,airports ,under grounds ,railway stations ,hospitals department stores ,banks ,schools theaters ,multi storey buildings ,process control centers and etc.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
3 x 25/16	0.9/0.7	1.8	25.0	0.727/1.15	130	1230
3 x 35/16	0.9/0.7	1.8	27.0	0.524/1.15	160	1550
3 x 50/25	1.0/0.9	1.8	27.5	0.387/0.727	195	1800
3 x 70/35	1.1/0.9	1.9	31.0	0.268/0.524	247	2500
3 x 95/50	1.1/1.0	2.0	35.3	0.193/0.387	305	3410
3 x 120/70	1.2/1.1	2.1	38.2	0.153/0.268	355	4300
3 x 150/70	1.4/1.1	2.3	42.5	0.124/0.268	407	5220
3 x 185/95	1.6/1.1	2.4	47.0	0.0991/0.193	469	6600
3x240/120	1.7/1.2	2.6	53.0	0.0754/0.153	551	8520
3x300/150	1.8/1.4	2.8	58.3	0.0601/0.124	638	10620

4 x 1.5 re	0.7	1.8	12.5	12.1	24	210
4 x 2.5 re	0.7	1.8	13.5	7.41	32	260
4 x 4 re	0.7	1.8	14.6	4.61	42	340
4 x 6 re	0.7	1.8	15.8	3.08	53	440
4 x 10 rm	0.7	1.8	17.8	1.83	73	630
4 x 16 rm	0.7	1.8	21.5	1.15	96	920
4 x 25 rm	0.9	1.8	25.7	0.727	130	1410
4 x 35 rm	0.9	1.8	27.6	0.524	160	1830
4 x 50 sm	1.0	1.8	28.5	0.387	195	1960
4 x 70 sm	1.1	2.0	33.0	0.268	247	2730
4 x 95 sm	1.1	2.1	37.0	0.193	305	3900
4 x 120sm	1.2	2.2	40.5	0.153	355	4800
4 x 150sm	1.4	2.3	44.8	0.124	407	6010
4 x 185sm	1.6	2.5	49.0	0.0991	469	7400
4 x 240sm	1.7	2.6	55.0	0.0754	551	9700

5 x 1.5	0.7	1.8	13.3	12.1	18	240
5 x 2.5	0.7	1.8	14.3	7.41	24	310
5 x 4	0.7	1.8	15.7	4.61	31.5	400
5 x 6	0.7	1.8	17.0	3.08	40	525
5 x 10	0.7	1.8	19.3	1.83	55	750
5 x 16	0.7	1.8	23.5	1.15	72	1120
5 x 25	0.9	1.8	28.2	0.727	98	1750
5 x 35	0.9	1.9	30.8	0.524	120	2200
5 x 50	1.0	2.1	35.1	0.387	146	2950



## Fire resisting ,halogen free & flame retardant power cables 0.6/1 KV

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. 0.6/1 KV Fire resisting



### Technical data :

- Power cable according to IEC 60502 and IEC 60331
- Temperature range : flexing -5°C to +50°C fixed installation -30°C to +70°C
- Nominal voltage :  $U_0/U=0.6/1$  KV
- Test voltage a.c. ,50Hz : 4 KV

### Cable structure :

- Cu / MGT / XLPE / LSHF
- Copper conductor class1 or 2 acc. to IEC 60228
- Mica glass fiber tape
- Insulation XLPE
- Filler : halogen free compound
- Sheath: halogen free flame retardant

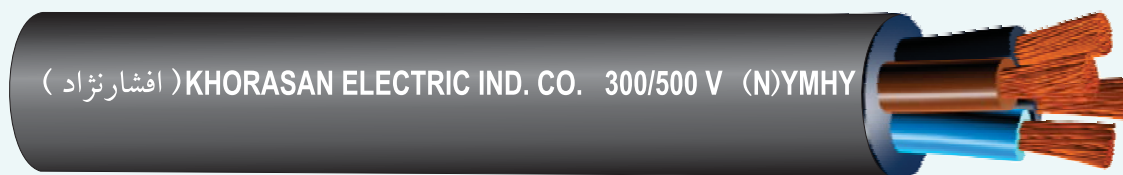
### Application :

- Where in case of fire human life and material assets are to be protected and a safety consciousness take a special significance, e.g. in industrial complexes, public buildings, hotels, airports, under ground railway networks, hospitals.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 1.5 re	0.7	1.8	12.0	12.1	24	205
2 x 2.5 re	0.7	1.8	12.8	7.41	32	242
2 x 4 re	0.7	1.8	13.8	4.61	42	300
2 x 6 re	0.7	1.8	14.7	3.08	53	380
2 x 10 rm	0.7	1.8	17.5	1.83	73	510
2 x 16 rm	0.7	1.8	19.3	1.15	96	670
2 x 25 rm	0.9	1.8	22.7	0.727	130	980
3 x 1.5 re	0.7	1.8	12.6	12.1	24	230
3 x 2.5 re	0.7	1.8	13.5	7.41	32	278
3 x 4 re	0.7	1.8	14.4	4.61	42	347
3 x 6 re	0.7	1.8	15.5	3.08	53	432
3 x 10 rm	0.7	1.8	18.2	1.83	73	625
3 x 16 rm	0.7	1.8	20.3	1.15	96	850
3 x 25 rm	0.9	1.8	24.0	0.727	130	1200
4 x 1.5 re	0.7	1.8	13.3	12.1	24	270
4 x 2.5 re	0.7	1.8	14.4	7.41	32	325
4 x 4 re	0.7	1.8	15.4	4.61	42	415
4 x 6 re	0.7	1.8	16.8	3.08	53	520
4 x 10 rm	0.7	1.8	19.8	1.83	73	770
4 x 16 rm	0.7	1.8	22.1	1.15	96	1020
4 x 25 rm	0.9	1.8	26.2	0.727	130	1560



## Flexible control cable (N) YMHY 300/500 V



### Technical data :

- Control cable similar to IEC 60227-7 and DIN VDE 0245
- Temperature range :**  
max. permissible temperature in conductor in operation +70 °C  
in short-circuit +150 °C  
flexing -5 °C to +50 °C  
fixed installation -40 °C to +70 °C
- **Nominal voltage :**  $U_0/U=300/500$  V
- Test voltage a.c. ,50 Hz :** 2 KV, 5min

### Cable structure :

- Cu / PVC / PVC
- Copper conductor class 5 acc. to IEC 60228
- Insulation PVC/D
- Cores stranded in layer without central core
- Sheath PVC/ST9 70 °C

### Application :

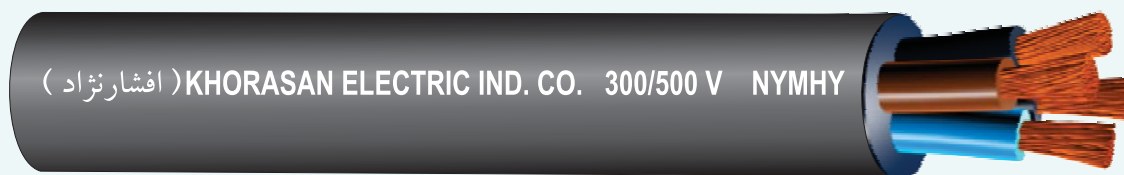
- Used as control and connecting cable in machines ,conveyor belts ,production lines ,machine tool industries ,progressive assembly lines ,automatic handling apparatus for medium mechanical stress.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x4	0.8	1.3	11	4.95	34	197
3 x4	0.8	1.3	11.7	4.95	34	240
4 x4	0.8	1.4	13	4.95	34	300
5 x4	0.8	1.4	14.2	4.95	25.5	360
7 x4	0.8	1.4	15.5	4.95	22.1	480
12 x4	0.8	1.6	21	4.95	17.85	830
2 x6	0.8	1.3	12.2	3.3	43	281
3 x6	0.8	1.4	13.1	3.3	43	360
4 x6	0.8	1.4	14.5	3.3	43	420
5 x6	0.8	1.5	16	3.3	32.25	520
7 x6	0.8	1.5	18	3.3	27.95	645
2 x 10	1.0	1.5	15.8	1.91	59	400
3 x 10	1.0	1.5	16.3	1.91	59	532
4 x 10	1.0	1.5	18	1.91	59	693
5 x 10	1.0	1.6	20	1.91	44.25	860
7 x 10	1.0	1.6	22	1.91	38.35	1110
2 x 16	1.0	1.6	20	1.21	79	600
3 x 16	1.0	1.6	20.5	1.21	79	810
4 x 16	1.0	1.7	22.5	1.21	79	1020
5 x 16	1.0	1.7	25	1.21	59.25	1250
7 x 16	1.0	1.8	28	1.21	51.35	1770
2 x 25	1.2	1.8	22.5	0.78	106	730
3 x 25	1.2	1.8	24	0.78	106	1210
4 x 25	1.2	1.8	27.2	0.78	106	1560
5 x 25	1.2	1.9	30.5	0.78	79.5	1850





## PVC sheathed flexible cable H05VV-F (or NYMHY) 300/500 V



### Technical data :

-Flexible cable according to IEC 60227-53, ISIRI 607-53 and BS 6500

#### -Temperature range :

max. permissible temperature in conductor

in operation  $+70^{\circ}\text{C}$

in short-circuit  $+150^{\circ}\text{C}$

On the surface

flexing  $-5^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$

fixed installation  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$

- **Nominal voltage** :  $U_0/U=300/500\text{ V}$

- **Test voltage a.c.** , 50 Hz : 2 KV, 5min

### Cable structure :

-Cu / PVC / PVC

-Copper conductor  
class 5 acc. to IEC 60228

-Insulation PVC/D

-Sheath PVC/ST9  $70^{\circ}\text{C}$

### Application :

-General purpose in damp and dry premisses.

For portable machines and appliances , where medium mechanical stresses and flexibility are required.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max resistance	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 0.75	0.6	0.8	6.3	26	12	57
2 x 1	0.6	0.8	6.7	19.5	15	65
2 x 1.5	0.7	0.8	7.6	13.3	18	88
2 x 2.5	0.8	1	9.4	7.48	26	136
3 x 0.75	0.6	0.8	6.7	26	12	67
3 x 1	0.6	0.8	7.1	19.5	15	78
3 x 1.5	0.7	0.9	8.3	13.3	18	110
3 x 2.5	0.8	1.1	10.1	7.48	26	169
4 x 0.75	0.6	0.8	7.3	26	12	81
4 x 1	0.6	0.9	7.9	19.5	15	99
4 x 1.5	0.7	1	9.3	13.3	18	138
4 x 2.5	0.8	1.1	11.1	7.48	26	207
5 x 0.75	0.6	0.9	8.2	26	12	97
5 x 1	0.6	0.9	8.6	19.5	15	116
5 x 1.5	0.7	1.1	10.3	13.3	18	174
5 x 2.5	0.8	1.2	12.3	7.48	26	258



## Flexible control cable NYSLY 300/500 V



### Technical data :

- Control cable according to IEC 60227-7 and DIN VDE 0245
- Temperature range :**  
max. permissible temperature in conductor in operation +70 °C  
in short-circuit +150 °C  
flexing -5 °C to +50 °C  
fixed installation -40 °C to +70 °C
- **Nominal voltage :**  $U_0/U=300/500$  V
- Test voltage a.c. ,50 Hz :** 2 KV, 5min

### Cable structure :

- Cu / PVC / PVC
- Copper conductor class 5 acc. to IEC 60228
- Insulation PVC/D
- Cores stranded in layer without central core
- Sheath PVC/ST9 70 °C

### Application :

- Used as control and connecting cable in machines ,conveyor belts ,production lines ,machine tool industries ,progressive assembly lines ,automatic handling apparatus for medium mechanical stress.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 0.5	0.6	0.7	5.7	39	9.0	45
3 x 0.5	0.6	0.7	6	39	9.0	53
4 x 0.5	0.6	0.8	6.8	39	9.0	66
5 x 0.5	0.6	0.8	7.4	39	6.7	78
6 x 0.5	0.6	0.9	8.2	39	6.7	100
7 x 0.5	0.6	0.9	8.2	39	5.8	120
8 x 0.5	0.6	1.0	9.1	39	5.8	125
10 x 0.5	0.6	1.0	10.6	39	5.0	166
12 x 0.5	0.6	1.1	11.1	39	4.8	186
18 x 0.5	0.6	1.2	13.1	39	4.0	264
19 x 0.5	0.6	1.2	13.1	39	4.0	294
25 x 0.5	0.6	1.3	15.4	39	3.6	366
27 x 0.5	0.6	1.4	16	39	3.5	393
36 x 0.5	0.6	1.5	18	39	3.3	510
37 x 0.5	0.6	1.5	18	39	3.3	520
40 x 0.5	0.6	1.6	18.9	39	3.1	556
42 x 0.5	0.6	1.6	19.5	39	3.1	608
50 x 0.5	0.6	1.7	21.5	39	3.0	710
61 x 0.5	0.6	1.8	22.9	39	3.0	826

2 x 0.75	0.6	0.8	6.4	26	12	57
3 x 0.75	0.6	0.8	6.7	26	12	68
4 x 0.75	0.6	0.8	7.3	26	12	81
5 x 0.75	0.6	0.9	8.2	26	9.0	109
6 x 0.75	0.6	0.9	8.9	26	9.0	130
7 x 0.75	0.6	1.0	9.1	26	8.0	143
8 x 0.75	0.6	1.0	9.8	26	7.2	165
10 x 0.75	0.6	1.1	11.7	26	6.6	215
12 x 0.75	0.6	1.1	12	26	6.3	231
18 x 0.75	0.6	1.3	14.5	26	6.0	336
19 x 0.75	0.6	1.3	14.5	26	5.4	342
25 x 0.75	0.6	1.4	17	26	4.8	466
27 x 0.75	0.6	1.5	17.6	26	4.8	512
36 x 0.75	0.6	1.6	19.7	26	4.2	665
37 x 0.75	0.6	1.6	19.7	26	4.2	680
40 x 0.75	0.6	1.7	20.7	26	4.2	706
42 x 0.75	0.6	1.8	21.6	26	4.0	762
50 x 0.75	0.6	1.8	23.5	26	4.0	900
61 x 0.75	0.6	2.0	25.2	26	4.0	1062



## Flexible control cable NYSLY 300/500 V



### Technical data :

- Control cable according to IEC 60227-7 and DIN VDE 0245
- Temperature range :**  
max. permissible temperature in conductor in operation +70 °C  
in short-circuit +150 °C  
flexing -5 °C to +50 °C  
fixed installation -40 °C to +70 °C
- **Nominal voltage :**  $U_0/U=300/500$  V
- Test voltage a.c. ,50 Hz :** 2 KV, 5min

### Cable structure :

- Cu / PVC / PVC
- Copper conductor class 5 acc. to IEC 60228
- Insulation PVC/D
- Cores stranded in layer without central core
- Sheath PVC/ST9 70 °C

### Application :

- Used as control and connecting cable in machines ,conveyor belts ,production lines ,machine tool industries ,progressive assembly lines ,automatic handling apparatus for medium mechanical stress.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 1	0.6	0.8	6.7	19.5	15.0	66
3 x 1	0.6	0.8	7.1	19.5	15.0	79
4 x 1	0.6	0.8	7.7	19.5	15.0	103
5 x 1	0.6	0.9	8.6	19.5	11.2	121
6 x 1	0.6	1.0	9.6	19.5	11.2	150
7 x 1	0.6	1.0	9.6	19.5	9.7	180
8 x 1	0.6	1.1	10.6	19.5	9.7	206
10 x 1	0.6	1.2	12.5	19.5	8.3	243
12 x 1	0.6	1.2	12.9	19.5	8.0	278
18 x 1	0.6	1.3	15.3	19.5	6.7	397
19 x 1	0.6	1.3	15.3	19.5	6.7	442
25 x 1	0.6	1.4	18	19.5	6.0	552
27 x 1	0.6	1.5	18.6	19.5	5.8	590
36 x 1	0.6	1.7	21.1	19.5	5.5	772
37 x 1	0.6	1.7	21.1	19.5	5.5	800
40 x 1	0.6	1.8	22	19.5	5.2	850
42 x 1	0.6	1.8	23	19.5	5.2	905
50 x 1	0.6	1.9	25.1	19.5	5.0	1082
61 x 1	0.6	2.1	27	19.5	5.0	1275

2 x 1.5	0.7	0.8	7.7	13.3	18	88
3 x 1.5	0.7	0.9	8.3	13.3	18	111
4 x 1.5	0.7	0.9	9.1	13.3	18	135
5 x 1.5	0.7	1.0	10.1	13.3	13.5	165
6 x 1.5	0.7	1.1	11.3	13.3	13.5	209
7 x 1.5	0.7	1.2	11.5	13.3	12	225
8 x 1.5	0.7	1.2	12.5	13.3	10.8	261
10 x 1.5	0.7	1.3	14.7	13.3	9.9	353
12 x 1.5	0.7	1.3	15.1	13.3	9.5	390
18 x 1.5	0.7	1.5	18	13.3	9.0	565
19 x 1.5	0.7	1.5	18	13.3	8.1	575
25 x 1.5	0.7	1.7	21.5	13.3	7.2	795
27 x 1.5	0.7	1.8	22.1	13.3	7.2	847
36 x 1.5	0.7	2.0	25.1	13.3	6.3	1105
37 x 1.5	0.7	2.0	25.1	13.3	6.3	1115
40 x 1.5	0.7	2.1	26.2	13.3	6.3	1212
42 x 1.5	0.7	2.1	27.2	13.3	6.0	1290
50 x 1.5	0.7	2.2	30	13.3	6.0	1545
61 x 1.5	0.7	2.4	32	13.3	6.0	1815



## Flexible control cable NYSLYCY 300/500 V



( افشارنژاد ) KHORASAN ELECTRIC IND. CO. 300/500 V NYSLYCY

### Technical data :

- Control cable according to IEC 60227-7 and DIN VDE 0245
- Temperature range :**  
max. permissible temperature in conductor in operation +70 °C  
in short-circuit +150 °C  
flexing -5 °C to +50 °C  
fixed installation -40 °C to +70 °C
- **Nominal voltage :**  $U_0/U=300/500$  V
- Test voltage a.c.** , 50 Hz : 2 KV, 5min

### Cable structure :

- Cu / PVC / PVC / Cu / PVC
- Copper conductor  
class5 acc. to IEC 60228
- Insulation PVC/D
- Cores stranded in layer without central core
- Tinned copper braided screening ,  
coverage approx. 85%
- Sheath PVC/ST9 70 °C

### Application :

-As control and connecting cable in machines ,conveyor belts , production lines , machine tool industries , progressive assembly lines ,automatic handling apparatus for medium mechanical stress and for fixed installation but not suitable for open air. The copper screening assures a disturbance-free data and signal transmission for measuring and control systems.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 0.5	0.6	0.9	7.8	39	9.0	94
3 x 0.5	0.6	0.9	8.5	39	9.0	110
4 x 0.5	0.6	0.9	9.2	39	9.0	127
5 x 0.5	0.6	1.0	10.2	39	6.7	158
6 x 0.5	0.6	1.0	10.9	39	6.7	179
7 x 0.5	0.6	1.1	11.6	39	5.8	195
8 x 0.5	0.6	1.1	12.2	39	5.8	215
10 x 0.5	0.6	1.2	13.5	39	5.0	260
12 x 0.5	0.6	1.3	13.8	39	4.8	285
18 x 0.5	0.6	1.3	16.5	39	4.0	390
19 x 0.5	0.6	1.3	17	39	4.0	415
25 x 0.5	0.6	1.5	20	39	3.6	560
27 x 0.5	0.6	1.6	21	39	3.5	606
36 x 0.5	0.6	1.7	22	39	3.3	685
37 x 0.5	0.6	1.7	22	39	3.3	700
40 x 0.5	0.6	1.8	22.8	39	3.1	760
42 x 0.5	0.6	1.9	23.5	39	3.1	790
50 x 0.5	0.6	1.9	25.9	39	3.0	1000
61 x 0.5	0.6	2.1	28	39	3.0	1100

2 x 0.75	0.6	0.9	8.3	26	12.0	103
3 x 0.75	0.6	0.9	8.9	26	12.0	117
4 x 0.75	0.6	1.0	10.2	26	12.0	153
5 x 0.75	0.6	1.0	10.8	26	9.0	175
6 x 0.75	0.6	1.1	11.5	26	9.0	200
7 x 0.75	0.6	1.2	12.3	26	8.0	240
8 x 0.75	0.6	1.2	13	26	7.2	270
10 x 0.75	0.6	1.3	14.3	26	6.6	307
12 x 0.75	0.6	1.3	14.5	26	6.3	330
18 x 0.75	0.6	1.5	17.6	26	6.0	490
19 x 0.75	0.6	1.5	18.5	26	5.4	535
25 x 0.75	0.6	1.6	21	26	4.8	660
27 x 0.75	0.6	1.7	22.5	26	4.8	715
36 x 0.75	0.6	1.8	23.7	26	4.2	900
37 x 0.75	0.6	1.8	24	26	4.2	910
40 x 0.75	0.6	1.9	24.3	26	4.2	965
42 x 0.75	0.6	2.0	24.3	26	4.0	980
50 x 0.75	0.6	2.1	27.5	26	4.0	1180
61 x 0.75	0.6	2.2	31.7	26	4.0	1420



## Flexible control cable NYSLYCY 300/500 V



( افشارنژاد ) KHORASAN ELECTRIC IND. CO. 300/500 V NYSLYCY

### Technical data :

- Control cable according to IEC 60227-7 and DIN VDE 0245
- Temperature range :**  
max. permissible temperature in conductor in operation +70 °C  
in short-circuit +150 °C  
flexing -5 °C to +50 °C  
fixed installation -40 °C to +70 °C
- **Nominal voltage :**  $U_0/U=300/500$  V
- Test voltage a.c.** , 50 Hz : 2 KV, 5min

### Cable structure :

- Cu / PVC / PVC / Cu / PVC
- Copper conductor  
class5 acc. to IEC 60228
- Insulation PVC/D
- Cores stranded in layer without central core
- Tinned copper braided screening , coverage approx. 85%
- Sheath PVC/ST9 70 °C

### Application :

- As control and connecting cable in machines ,conveyor belts , production lines , machine tool industries , progressive assembly lines ,automatic handling apparatus for medium mechanical stress and for fixed installation but not suitable for open air. The copper screening assures a disturbance-free data and signal transmission for measuring and control systems.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C (Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 1	0.6	0.9	8.9	19.5	15.0	115
3 x 1	0.6	1.0	9.4	19.5	15.0	143
4 x 1	0.6	1.0	10.5	19.5	15.0	177
5 x 1	0.6	1.1	11.2	19.5	11.2	208
6 x 1	0.6	1.1	12	19.5	11.2	240
7 x 1	0.6	1.2	12.8	19.5	9.7	270
8 x 1	0.6	1.2	13.5	19.5	9.7	305
10 x 1	0.6	1.3	15.4	19.5	8.3	396
12 x 1	0.6	1.4	16.2	19.5	8.0	426
18 x 1	0.6	1.5	19	19.5	6.7	567
19 x 1	0.6	1.5	20	19.5	6.7	622
25 x 1	0.6	1.6	23	19.5	6.0	772
27 x 1	0.6	1.7	24.3	19.5	5.8	830
36 x 1	0.6	1.9	25.9	19.5	5.5	1060
37 x 1	0.6	1.9	25.9	19.5	5.5	1080
40 x 1	0.6	2.0	26.3	19.5	5.2	1140
42 x 1	0.6	2.1	26.8	19.5	5.2	1180
50 x 1	0.6	2.1	30	19.5	5.0	1320
61 x 1	0.6	2.3	32	19.5	5.0	1540

2 x 1.5	0.7	1.0	9.5	13.3	18	148
3 x 1.5	0.7	1.0	10.3	13.3	18	178
4 x 1.5	0.7	1.1	11.1	13.3	18	210
5 x 1.5	0.7	1.2	11.8	13.3	13.5	239
6 x 1.5	0.7	1.2	12.7	13.3	13.5	285
7 x 1.5	0.7	1.3	13.8	13.3	12	320
8 x 1.5	0.7	1.3	14.3	13.3	10.8	350
10 x 1.5	0.7	1.4	15.4	13.3	9.9	440
12 x 1.5	0.7	1.5	17.1	13.3	9.5	510
18 x 1.5	0.7	1.7	20.5	13.3	9	715
19 x 1.5	0.7	1.7	20.6	13.3	8.1	750
25 x 1.5	0.7	1.9	24.5	13.3	7.2	960
27 x 1.5	0.7	2.0	25.7	13.3	7.2	1030
36 x 1.5	0.7	2.2	27.5	13.3	6.3	1270
37 x 1.5	0.7	2.3	27.5	13.3	6.3	1310
40 x 1.5	0.7	2.3	29.1	13.3	6.3	1450
42 x 1.5	0.7	2.4	29.5	13.3	6	1480
50 x 1.5	0.7	2.4	35	13.3	6	1680
61 x 1.5	0.7	2.4	37.5	13.3	6	1880



## Heat resistance flexible cables (+105°C)



### Technical data :

- Special PVC cable with increased heat resistance
- Adapted to DIN VDE 0281
- 0.5-0.75 mm<sup>2</sup> similar to IEC60227-56 & ISIRI 607-56
- 1-2.5 mm<sup>2</sup> similar to IEC60227-57 & ISIRI 607-57
- Temperature range :**
- flexing -5°C to +105°C
- fixed installation -30°C to +105°C
- Nominal voltage :**
- 0.5-1 mm<sup>2</sup> : U<sub>0</sub>/U=300/500 V
- 1.5 mm<sup>2</sup> and above:U<sub>0</sub>/U=450/750 V
- Test voltage a.c. ,50Hz : 2000V**
- Insulation resistance:**
- min. 20 Mohm x km

### Cable structure :

- Cu / PVC / PVC
- Copper conductor class 5 acc. to IEC 60228
- Insulation Tl3 to DIN VDE 0281(+105°C)
- Sheath: heat resistant TM3 to DIN VDE 0281

### Application :

- Therm cables are ideal for use in machines, appliances or motors which are subject to direct contact with high temperatures.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Current capacity (A) in air 30°C	Approx. weight kg/km
2 x 0.5	0.6	0.7	5.7	39	9	45
3 x 0.5	0.6	0.7	6.0	39	9	53
5 x 0.5	0.6	0.8	7.4	39	6.7	78
7 x 0.5	0.6	0.9	8.2	39	5.8	120
10 x 0.5	0.6	1.0	10.6	39	5	166
12 x 0.5	0.6	1.1	11.1	39	4.8	186
19 x 0.5	0.6	1.2	13.1	39	4	294
25 x 0.5	0.6	1.3	15.4	39	3.6	366

2 x 0.75	0.6	0.8	6.4	26	12	57
3 x 0.75	0.6	0.8	6.7	26	12	68
4 x 0.75	0.6	0.8	7.3	26	12	81
5 x 0.75	0.6	0.9	8.2	26	9	109
7 x 0.75	0.6	1.0	9.1	26	8	143
10 x 0.75	0.6	1.1	11.7	26	6.6	215
12 x 0.75	0.6	1.1	12	26	6.3	231
19 x 0.75	0.6	1.3	14.5	26	5.4	342
25 x 0.75	0.6	1.4	17	26	4.8	466

2 x 1	0.6	0.8	6.7	19.5	15.0	66
3 x 1	0.6	0.8	7.1	19.5	15.0	79
4 x 1	0.6	0.8	7.7	19.5	15.0	103
5 x 1	0.6	0.9	8.6	19.5	11.2	121
7 x 1	0.6	1.0	9.6	19.5	9.7	170
10 x 1	0.6	1.2	12.5	19.5	8.3	243
12 x 1	0.6	1.2	12.9	19.5	8.0	278
19 x 1	0.6	1.3	15.3	19.5	6.7	442
25 x 1	0.6	1.4	18	19.5	6.0	552

2 x 1.5	0.7	0.8	7.7	13.3	18	88
3 x 1.5	0.7	0.9	8.3	13.3	18	111
4 x 1.5	0.7	0.9	9.1	13.3	18	135
5 x 1.5	0.7	1.0	10.1	13.3	13.5	165
7 x 1.5	0.7	1.2	11.5	13.3	12	225
10 x 1.5	0.7	1.3	14.7	13.3	9.9	353
12 x 1.5	0.7	1.3	15.1	13.3	9.5	390
19 x 1.5	0.7	1.5	18	13.3	8.1	575
25 x 1.5	0.7	1.7	21.5	13.3	7.2	795

2 x 2.5	0.8	1.0	9.5	7.98	26	140
3 x 2.5	0.8	1.1	10.1	7.98	26	175
4 x 2.5	0.8	1.1	11.2	7.98	26	210
5 x 2.5	0.8	1.2	12.5	7.98	19.5	260
7 x 2.5	0.8	1.4	14	7.98	17	310
10 x 2.5	0.8	1.5	17.8	7.98	14	470

2 x 4	0.8	1.3	11	4.95	34	200
4 x 4	0.8	1.4	13.1	4.95	34	310



## Flat non sheathed cord

( افشارتراژاد ) KHORASAN ELECTRIC IND. CO. Flat non sheathed cord 300/300V

( افشارتراژاد ) KHORASAN ELECTRIC IND. CO. Flat non sheathed cord 300/300V

### Technical data :

- Flat non sheathed cord adapted to ISIRI 607-42 , IEC 60227 and H03VH-H 0.5 & 0.75 mm<sup>2</sup> acc. to standard 1mm<sup>2</sup> and above similar to standard
- Temperature range :**  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :** U<sub>0</sub>/U=300/300 V

### Cable structure :

- Cu / PVC
- Copper conductor class 6 (very fine ) acc. to IEC 60228 and ISIRI 3084
- Two conductors are laid in parallel
- White insulation PVC/D

### Application :

- In dry indoors, for connecting portable appliances, where mechanical stresses are low. Application for heating appliances is not permissible.

No. cores xNominal cross section mm <sup>2</sup>	No. of strands x Dia. mm	Insulation thickness mm	Overall diameter mm	Approx. weight kg/km	Current capacity (A) in air 30°C
2 x 0.5	24 x 0.16	0.8	2.6x5.4	21	9
2 x 0.75	37 x 0.16	0.8	2.8x5.8	26	13
2 x 1	50 x 0.16	0.8	3 x 6	35	15
2 x 1.5	70 x 0.16	1.0	3.6x7.4	50	18
2 x 2.5	116x0.16	1.0	4.6x9.3	80	25
2 x 4	187x0.16	1.2	5.8x11.4	125	34



## Flexible PVC single cores NYAF

(افشار تیزاد) KHORASAN ELECTRIC IND. CO. IEC 60227-03 450/750 V

(افشار تیزاد) KHORASAN ELECTRIC IND. CO. IEC 60227-03 450/750 V

### Technical data :

- PVC single cores as DIN VDE 0281-3 ,IEC 60227-3 and ISIRI 607-3
- Temperature range :**  
flexing -5°C to +70°C  
fixed installation -30°C to +80°C
- Nominal voltage :**  
0.5-1 mm<sup>2</sup> : U<sub>r</sub>/U=300/500 V  
1.5 mm<sup>2</sup> and above:U<sub>r</sub>/U=450/750 V
- Test voltage a.c. ,50Hz :** 2500V

### Cable structure :

- Cu / PVC
- Bare annealed copper fine wire stranded to VDE 0295, HD 383, IEC 60228 and ISIRI 3084 class5.
- Insulation PVC/C

### Application :

- These insulated wires are suitable for laying in tubes, under and surface mounting of plasters , in closed installation conduits and in electrical panels and devices. Direct laying in plaster is not permitted.

Nominal cross section mm <sup>2</sup>	Insulation thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Approx weight kg/km	Rated voltage V
0.5	0.6	2.13	39.0	8.9	300/500
0.75	0.6	2.35	26.0	11.8	
1.0	0.6	2.55	19.5	14.5	
1.5	0.7	3.0	13.3	21.0	
2.5	0.8	3.65	7.98	33.0	
4	0.8	4.2	4.95	48.5	450/750
6	0.8	4.8	3.3	68.5	
10	1.0	6.2	1.91	114.5	
16	1.0	7.95	1.21	184	
25	1.2	9.8	0.78	284	
35	1.2	11.3	0.554	395	
50	1.4	13.4	0.386	557	
70	1.4	15.3	0.272	759	
95	1.6	17.7	0.206	1024	
120	1.6	19.7	0.161	1280	
150	1.8	22	0.129	1601	
185	2.0	24.6	0.106	2000	
240	2.2	27.8	0.0801	2552	





## Solid PVC single cores NYA

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. IEC60227-01 300/500V

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. IEC60227-01 300/500V

### Technical data :

- PVC single cores as DIN VDE 0281-3 ,IEC 60227-3 and ISIRI 607-3
- Temperature range :**  
flexing -5°C to +70°C  
fixed installation -30°C to +80°C
- Nominal voltage :**  
0.5-1 mm<sup>2</sup> : U<sub>n</sub>/U=300/500 V  
1.5 mm<sup>2</sup> and above:U<sub>n</sub>/U=450/750 V
- Test voltage a.c. ,50Hz :** 2500V

### Cable structure :

- Cu / PVC
- Bare annealed copper solid or stranded to VDE 0295, HD 383, IEC 60228 and ISIRI 3084 class 1 and class 2.
- Insulation PVC/C

### Application :

- These insulated wires are suitable for laying in tubes, under and surface mounting of plasters, in closed installation conduits and in electrical panels and devices. Direct laying in plaster is not permitted.

No. cores xNominal cross section mm <sup>2</sup>	Insulation thickness mm	Overall diameter mm	Max. resistance at 20 °C(Ω/KM)	Approx weight kg/km	Rated voltage V
0.5	0.6	2.0	36.0	8.4	300/500
0.75	0.6	2.2	24.5	11.2	
1.0	0.6	2.25	18.1	13.9	
1.5	0.7	2.8	12.1	20.2	
2.5	0.8	3.4	7.41	31.8	
4	0.8	3.9	4.61	46.6	450/750
6	0.8	4.4	3.08	66	
10	1.0	5.6	1.83	110	
16	1.0	7.1	1.15	176	
25	1.2	8.8	0.727	276	
35	1.2	10	0.524	373	
50	1.4	11.7	0.387	500	
70	1.4	14	0.268	700	
95	1.6	16	0.193	970	
120	1.6	17.5	0.163	1200	
150	1.8	19.5	0.124	1500	
185	2.0	21.8	0.0991	1850	
240	2.2	24.7	0.0764	2400	



## Low-tension wires with thin wall insulation for automobiles AVS,AVSS

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. AVSS

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. AVSS

### Technical data :

- Automobile wires as JASO D611 and KES D-C626
- Insulator thickness :  
AVS : 0.5 to 0.7 mm  
AVSS : 0.3 to 0.4 mm
- Withstand voltage :  
**spark:**  
5000V for a minimum duration of 0.15 s  
**under water :**  
1000V for a minimum duration of one minute

### Cable structure :

- Cu / PVC
- Plain annealed stranded copper conductor
- Thin wall PVC insulation

### Application :

- Used for automobiles wiring

Nominal size mm <sup>2</sup>	No. of strands x dia mm	Conductor overall diameter mm	Insulation thickness mm	Overall diameter mm	Max. resistance at 20 °C
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#### AVS

0.3	7x0.26	0.8	0.5	1.8	0.0502
0.5	7x0.32	1.0	0.5	2.0	0.0327
0.85a	16x0.26	1.2	0.5	2.2	0.022
0.85b	11x0.32	1.2	0.5	2.2	0.0208
1.25	16x0.32	1.5	0.5	2.5	0.0143
2.0	26x0.32	1.9	0.5	2.9	0.00881
3.0	41x0.32	2.4	0.6	3.6	0.00559
5.0	65x0.32	3.0	0.7	4.4	0.00352

#### AVSS

0.3	7x0.26	0.8	0.3	1.4	0.0502
0.5	7x0.32	1.0	0.3	1.6	0.0327
0.85	19x0.24	1.2	0.3	1.8	0.0217
1.25	19x0.29	1.5	0.3	2.1	0.0149
2.0	37x0.26	1.8	0.4	2.6	0.0095



## Automobiles wire (Class T2,100°C) as PSA

(افشار نژاد) KHORASAN ELECTRIC IND. CO.

(افشار نژاد) KHORASAN ELECTRIC IND. CO.

### Technical data :

- Automobile wires as STE  
9609503299 for peugeots
- Temperature class : T2,  $100 \pm 2^\circ\text{C}$
- Test temperature :  $125^\circ\text{C}$
- Oil resistant
- Resistant to ozone

### Cable structure :

- Cu / PVC
- Plain annealed stranded  
copper conductor
- Max. lay length : 25 x D
- Thin wall PVC insulation

### Application :

- Used for automobiles wiring of  
operation temperature  $100^\circ\text{C}$

Nominal size mm <sup>2</sup>	No. of strands x dia mm	Conductor overall diameter mm	Insulation thickness mm	Overall diameter mm	Max. resistance at $20^\circ\text{C}(\Omega/\text{KM})$
0.35	7x0.25	0.75	0.22	1.34	55.9
0.6	12x0.25	1.0	0.28	1.83	33
1.0	19x0.25	1.25	0.30	2.07	19.5
1.4	27x0.25	1.5	0.32	2.32	13.9
2.0	37x0.25	1.75	0.36	2.7	10
3.0	45x0.30	2.3	0.40	3.35	6.06
4.0	56x0.30	2.7	0.40	3.8	4.95
5.0	70x0.30	2.8	0.40	3.9	3.94
7.0	105x0.30	3.4	0.48	4.9	2.72
10	144x0.30	4.1	0.48	5.9	1.91
16	126x0.40	5.1	0.52	6.9	1.21
20	150x0.40	5.6	0.52	7.4	0.99
25	192x0.40	6.45	0.52	8.1	0.78
40	189x0.50	8.8	0.64	10.8	0.493



## Thermoplastic low smoke halogen free wires for automobiles (Class T3, 125°C) as PSA

( افشار نژاد ) KHORASAN ELECTRIC IND. CO.

( افشار نژاد ) KHORASAN ELECTRIC IND. CO.

### Technical data :

- Automobile wires as STE  
9609503299 for peugeot
- Temperature class : T3,  $125 \pm 2^\circ\text{C}$
- Test temperature :  $150^\circ\text{C}$
- Oil resistant
- Resistant to ozone

### Cable structure :

- Cu / LSHF
- Plain annealed stranded  
copper conductor
- Max. lay length :  $25 \times D$
- Thin wall insulation

### Application :

- Used for automobiles wiring of  
operation temperature  $125^\circ\text{C}$   
near engine and exhaust.

Nominal size mm <sup>2</sup>	No. of strands x dia mm	Conductor overall diameter mm	Insulation thickness mm	Overall diameter mm	Max. resistance at $20^\circ\text{C} (\Omega/\text{KM})$
0.6	12x0.25	1.0	0.28	1.83	33
1.0	19x0.25	1.25	0.30	2.07	19.5
1.4	27x0.25	1.5	0.32	2.32	13.9
2	37x0.25	1.75	0.36	2.70	10
3	45x0.30	2.3	0.40	3.35	6.06
4	56x0.30	2.7	0.40	3.8	4.95
5	70x0.30	2.8	0.40	3.9	3.94
7	105x0.30	3.4	0.48	4.9	2.72



## Hard drawn copper conductors



### Technical data :

- Hard drawn copper with E-CU
- Standard: DIN 48201 , BS 125
- Min. tensile strength : 400 N / mm<sup>2</sup>

### Cable structure :

- Stranded copper without annealing and sheath

### Application :

- Aerial power distribution

Conductor nominal cross section mm <sup>2</sup>	No. of strands x dia. mm	Overall diameter mm	Approx. weight kg/km	Breaking load KN
16	7 x 1.70	5.1	140	6.4
25	7 x 2.14	6.42	221	9.7
35	7 x 2.52	7.56	312	13.6
50	19 x 1.78	8.9	440	19.2
70	19 x 2.14	10.7	600	26.4
95	19 x 2.52	12.6	845	37.2
120	37 x 2.03	14.2	1047	47
150	37 x 2.26	15.8	1325	58.7



## Telephone cable for building and internal usage J-Y(st)Y

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. JY(ST)Y



### Technical data :

- Telephone cable acc. to VDE 0815 ,IEC 60189 and TCI
- Temperature range :**  
during installation -5°C to +50°C  
before and after installation -30°C to +70°C
- Nominal voltage :** max. 200V
- Test voltage a.c. ,50Hz :**  
core/core 200V  
core/screen 1000V
- Insulation resistance:**  
min. 500 Mohm x km
- Mutual capacitance at 1000Hz:**max.100 nF/Km

### Cable structure :

- Bare or tinned annealed copper conductor, solid, 0.4,0.5,0.6,0.8 φmm
- PVC insulation
- Twinning: two insulated conductor twisted together
- static screen: polyester tape+drain wire+AL.polyester tape
- PVC sheath

### Application :

- These cables are used for telephone and signal transmission for permanent laying on or under plaster, outdoor on walls, and in Main Distribution Frame ( MDF ) systems. Laying underground is not permissible.

Number of pairs	Conductor diameter mm	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Approx weight kg/km
2	0.4	0.2	0.8	4.5	26
4	0.4	0.2	0.8	5.5	36
6	0.4	0.2	1.0	6.5	52
8	0.4	0.2	1.0	7.0	60
10	0.4	0.2	1.0	7.5	70
15	0.4	0.2	1.0	9.0	95
20	0.4	0.2	1.0	10.0	118
25	0.4	0.2	1.0	11.0	140
30	0.4	0.2	1.2	12.0	170
40	0.4	0.2	1.2	13.2	220
50	0.4	0.2	1.2	14.5	260
60	0.4	0.2	1.2	15.5	300
80	0.4	0.2	1.2	17.5	390
100	0.4	0.2	1.2	19.5	470
150	0.4	0.2	1.4	23	690
200	0.4	0.2	1.6	27	900

2	0.5	0.25	0.8	4.9	32
4	0.5	0.25	0.8	6.1	47
6	0.5	0.25	1.0	7.2	66
8	0.5	0.25	1.0	8.0	81
10	0.5	0.25	1.0	8.6	95
15	0.5	0.25	1.0	10	128
20	0.5	0.25	1.0	11	160
25	0.5	0.25	1.2	12.5	205
30	0.5	0.25	1.2	13.5	236
40	0.5	0.25	1.2	15.0	300
50	0.5	0.25	1.2	16.5	360
60	0.5	0.25	1.4	18.0	438
80	0.5	0.25	1.4	20.5	560
100	0.5	0.25	1.4	22.5	690
150	0.5	0.25	1.6	27.0	1100
200	0.5	0.25	1.8	31.5	1450



## Telephone cable for building and internal usage J-Y(st)Y

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. JY(ST)Y



### Technical data :

- Telephone cable acc. to VDE 0815  
.IEC 60189 and TCI
- Temperature range :**  
during installation -5°C to +50°C  
before and after installation -30°C to +70°C
- Nominal voltage :** max. 200V
- Test voltage a.c. ,50Hz :**  
core/core 200V  
core/screen 1000V
- Insulation resistance:**  
min. 500 Mohm x km
- Mutual capacitance at 1000Hz:**max.100 nF/Km

### Cable structure :

- Bare or tinned annealed copper conductor, solid, 0.4,0.5,0.6,0.8 φmm
- PVC insulation
- Twinning: two insulated conductor twisted together
- static screen: polyester tape+drain wire+AL.polyester tape
- PVC sheath

### Application :

- These cables are used for telephone and signal transmission for permanent laying on or under plaster, outdoor on walls, and in Main Distribution Frame ( MDF ) systems. Laying underground is not permissible.

Number of pairs	Conductor diameter mm	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Approx weight kg/km
2	0.6	0.25	1.0	5.6	41
4	0.6	0.25	1.0	7.0	65
6	0.6	0.25	1.0	8.0	85
8	0.6	0.25	1.0	9.0	105
10	0.6	0.25	1.0	9.7	120
15	0.6	0.25	1.0	11.1	169
20	0.6	0.25	1.0	12.5	210
25	0.6	0.25	1.2	14.0	270
30	0.6	0.25	1.2	15.0	305
40	0.6	0.25	1.2	16.7	390
50	0.6	0.25	1.2	18.2	472
60	0.6	0.25	1.4	20.0	570
80	0.6	0.25	1.4	22.6	730
100	0.6	0.25	1.4	25.0	895
150	0.6	0.25	1.6	30.0	1310
200	0.6	0.25	1.8	35.0	1740

2	0.8	0.3	1.0	6.5	59
4	0.8	0.3	1.0	8.0	90
6	0.8	0.3	1.0	9.5	122
8	0.8	0.3	1.0	10.5	152
10	0.8	0.3	1.0	11.2	182
15	0.8	0.3	1.2	13.5	260
20	0.8	0.3	1.2	15.0	335
25	0.8	0.3	1.4	17.0	420
30	0.8	0.3	1.4	18.2	500
40	0.8	0.3	1.4	20.5	640
50	0.8	0.3	1.6	23.0	796
60	0.8	0.3	1.6	25.0	930
80	0.8	0.3	1.8	28.5	1250
100	0.8	0.3	1.8	32.0	1550



## Telecommunication subscriber cables A-2Y(st)2Y

( افشارنژاد ) KHORASAN ELECTRIC IND. CO. A-2Y(ST)2Y



### Technical data :

- Telephone cable acc. to IEC 60708 and TCI
- Temperature range :**  
during installation -5°C to +50°C  
before and after installation -30°C to +70°C
- Nominal voltage :** max. 200V
- Test voltage a.c. ,50Hz :**  
core/core 1000 V d.c duration 1 minute  
core/screen 3000 V d.c duration 1 minute
- Insulation resistance:**  
min. 5 Gohm×km
- Mutual capacitance :** max. avg. 55 nF/Km

### Cable structure :

- Bare or tinned annealed copper conductor, solid, 0.4,0.6 φmm
- PE insulation
- Twinning: two insulated conductor twisted together
- static screen: polyester tape+drain wire+AL.polyester tape
- PE sheath , Black

### Application :

- In telecommunication installation outdoors & as connecting cables in local networks. these subscriber connecting cables are suitable for direct burial and in cable ducts.
- For fire and hazardous areas, the installation without enough protective precaution, is not permitted.

Number of pairs	Conductor diameter mm	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Approx weight kg/km
2	0.4	0.2	1.0	4.6	19
4	0.4	0.2	1.0	5.5	28
6	0.4	0.2	1.0	6.2	37
8	0.4	0.2	1.0	6.7	44
10	0.4	0.2	1.0	7.3	53
15	0.4	0.2	1.2	8.7	76
20	0.4	0.2	1.4	10.2	102
25	0.4	0.2	1.4	10.8	121
30	0.4	0.2	1.6	12.0	148
40	0.4	0.2	1.6	13.3	185
50	0.4	0.2	1.6	14.5	222
60	0.4	0.2	1.8	15.9	270
80	0.4	0.2	1.8	17.7	340
100	0.4	0.2	2.0	19.5	430
150	0.4	0.2	2.2	23.6	620
200	0.4	0.2	2.4	27.0	820

2	0.6	0.25	1.0	5.4	28
4	0.6	0.25	1.0	6.6	46
6	0.6	0.25	1.0	7.6	63
8	0.6	0.25	1.0	8.4	79
10	0.6	0.25	1.2	9.5	100
15	0.6	0.25	1.4	11.3	145
20	0.6	0.25	1.4	12.5	185
25	0.6	0.25	1.4	13.8	224
30	0.6	0.25	1.6	15.2	270
40	0.6	0.25	1.6	17.0	345
50	0.6	0.25	1.6	18.5	416
60	0.6	0.25	1.8	20	490
80	0.6	0.25	1.8	23	650
100	0.6	0.25	2.0	26	820
150	0.6	0.25	2.2	31	1200
200	0.6	0.25	2.4	35.5	1590





## Telephone - installation cable J-YY

( افشارنژاد ) KHORASAN ELECTRIC IND. CO. J-YY



### Technical data :

- Telephone-installation cable acc. to VDE 0815 and IEC 60189
- Temperature range :**  
during operation -5°C to +50°C  
before and after installation -30°C to +70°C
- Nominal voltage :** max. 200V
- Test voltage a.c. ,50Hz :** core/core 800V
- Insulation resistance:**  
min. 100 Mohm x km
- Mutual capacitance at 1000 Hz:** 100 nF/Km

### Cable structure :

- Bare or tinned annealed copper conductor, solid, 0.5 & 0.6  $\phi$ mm
- PVC insulation
- Twinning:two insulated conductor twisted together
- the pairs are stranded to units of max. 25 pairs
- core wrapping with plastic tape
- PVC sheath

### Application :

- j-yy installation cables are preferably used as telephone cables in telephone stations and sub-extensions , suitable for installation in dry and damp environments as well as in the open air for fixed installation on outer walls of buildings. Laying underground is not permissible.

Number of pairs	Conductor diameter mm	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Approx weight kg/km
2.0	0.5	0.25	0.8	4.4	24
4.0	0.5	0.25	0.8	5.5	39
6.0	0.5	0.25	1.0	6.7	58
8.0	0.5	0.25	1.0	7.5	72
10	0.5	0.25	1.0	8.1	86
15	0.5	0.25	1.0	9.5	120
20	0.5	0.25	1.0	10.7	153
25	0.5	0.25	1.2	12.0	195
30	0.5	0.25	1.2	12.9	227
40	0.5	0.25	1.2	14.6	290
50	0.5	0.25	1.2	15.9	350
60	0.5	0.25	1.4	17.6	430
80	0.5	0.25	1.4	19.9	550
100	0.5	0.25	1.4	22.0	680
150	0.5	0.25	1.6	26.6	995
200	0.5	0.25	1.8	31.0	1320

2.0	0.6	0.25	1.0	5.0	33
4.0	0.6	0.25	1.0	6.2	53
6.0	0.6	0.25	1.0	7.2	71
8.0	0.6	0.25	1.0	8.0	90
10	0.6	0.25	1.0	8.7	108
15	0.6	0.25	1.0	10.2	150
20	0.6	0.25	1.0	11.4	190
25	0.6	0.25	1.2	13.2	245
30	0.6	0.25	1.2	14.1	285
40	0.6	0.25	1.2	16.0	368
50	0.6	0.25	1.2	17.5	450
60	0.6	0.25	1.4	19.3	545
80	0.6	0.25	1.4	22.0	703
100	0.6	0.25	1.4	24.2	870
150	0.6	0.25	1.6	29.3	1280
200	0.6	0.25	1.8	33.5	1680



## Instrumentation cable, pair screened RE-Y(ST)Y PIMF

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. RE-Y(ST)Y



### Technical data :

- Instrumentation cable acc. to BS 5308
- Temperature range :**  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :** max. 300 V
- Test voltage a.c. ,50Hz :**  
core/core 1000V \_ core/screen 1000 V
- Insulation resistance 500V d.c**  
individual conductor min. 25 Mohm x km  
individual screens min. 1 Mohm x km
- Mutual capacitance :** 250pF/m at 1KHz
- Capacitance between any core or screen :**  
400 pF/m at 1KHz

### Cable structure :

- Copper conductor class 2 or 5
- Core insulation of PVC
- Cores twisted in pairs with optimum pitch
- PIMF (pair in metal foil)
- Electro static (st) of plastics coated alu-foil and plastic foil
- Sheath of gray PVC

### Application :

-Instrumentation cables are used in data processing and process control. The individual screening of the pairs guarantee high cross-talk attenuation. The electro static screen protect the screened pairs against outer electro static interference fields.

Low level of line attenuations and low mutual capacitances enable long transmission distances and fast pulse acceleration. Instrumentation cables are suitable for fixed installation in damp locations , in open spaces and for under-ground laying.

No. pairs xNominal cross section mm <sup>2</sup>	conductor class	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Approx. weight kg/km
2 x2 x0.5	5	0.6	1.1	12.5	130
5 x2 x0.5	5	0.6	1.2	16.0	235
10x2x0.5	5	0.6	1.3	22.5	415
15x2x0.5	5	0.6	1.5	26.2	592
20x2x0.5	5	0.6	1.5	29.1	745
30x2x0.5	5	0.6	1.7	34.8	1095
50x2x0.5	5	0.6	2.2	45.4	1800

2 x2 x0.75	5	0.6	1.1	13.3	145
5 x2 x0.75	5	0.6	1.2	17.2	270
10x2x0.75	5	0.6	1.3	24.2	490
15x2x0.75	5	0.6	1.5	28.2	700
20x2x0.75	5	0.6	1.7	31.8	920
30x2x0.75	5	0.6	2.0	38.2	1350
50x2x0.75	5	0.6	2.2	50.0	2130

2 x2 x1.5	2	0.6	1.2	15.3	195
5 x2 x1.5	2	0.6	1.3	19.7	380
10x2x1.5	2	0.6	1.5	28.0	705
15x2x1.5	2	0.6	1.7	32.6	1020
20x2x1.5	2	0.6	1.7	36.3	1300
30x2x1.5	2	0.6	2.0	43.5	1930
50x2x1.5	2	0.6	2.2	56.0	3100



# Instrumentation cable, pair screened RE-2Y(ST)2Y PIMF

( افشار نژاد ) KHORASAN ELECTRIC IND. CO. RE-2Y(ST)2Y



## Technical data :

- Instrumentation cable acc. to BS 5308
- Temperature range :**  
flexing -5°C to +50°C  
fixed installation -30°C to +70°C
- Nominal voltage :** max. 300 V
- Test voltage a.c. ,50Hz :**  
core/core 1000V \_ core/screen 1000 V
- Insulation resistance 500V d.c**  
individual conductor min. 5 Gohm x km  
individual screens min. 1 Mohm x km
- Mutual capacitance :** 115pF/m at 1KHz
- Capacitance unbalance :**  
250 pF in 250 m

## Cable structure :

- Copper conductor class 1, 2 or 5
- Core insulation of PE
- Cores twisted in pairs with optimum pitch
- PIMF (pair in metal foil)
- Electro static (st) of plastics coated  
alu-foil and plastic foil
- Sheath of black PE

## Application :

- Instrumentation cables are used in data processing and process control. The individual screening of the pairs guarantee high cross-talk attenuation. The electro static screen protect the screened pairs against outer electro static interference fields.
- Low level of line attenuations and low mutual capacitances enable long transmission distances and fast pulse acceleration.
- Instrumentation cables are suitable for fixed installation in dramp locations , in open spaces and for under-ground laying.

No. pairs xNominal cross section mm <sup>2</sup>	conductor class	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Approx. weight kg/km
2 x2 x0.5	1	0.5	0.9	11.0	90
2 x2 x0.5	5	0.6	1.1	12.5	105
5 x2 x0.5	1	0.5	1.2	14.5	170
5 x2 x0.5	5	0.6	1.2	16.1	195
10x2x0.5	1	0.5	1.2	19.7	290
10x2x0.5	5	0.6	1.3	22.5	340
15x2x0.5	1	0.5	1.3	22.6	405
15x2x0.5	5	0.6	1.5	26.4	500
20x2x0.5	1	0.5	1.3	25.0	510
20x2x0.5	5	0.6	1.4	29.1	620
30x2x0.5	1	0.5	1.4	30.0	750
30x2x0.5	5	0.6	1.7	34.8	900
50x2x0.5	1	0.5	2.0	39.5	1270
50x2x0.5	5	0.6	2.2	45.4	1500

2 x2 x1	1	0.6	1.1	13.3	125
5 x2 x1	1	0.6	1.2	17.0	250
10x2x1	1	0.6	1.3	24.2	455
15x2x1	1	0.6	1.5	28.1	660
20x2x1	1	0.6	1.7	31.7	853
30x2x1	1	0.6	2.0	38.0	1263
50x2x1	1	0.6	2.2	49.0	2040

2 x2 x1.5	2	0.6	1.2	15.2	170
5 x2 x1.5	2	0.6	1.3	19.7	330
10x2x1.5	2	0.6	1.5	28.0	600
15x2x1.5	2	0.6	1.7	32.6	890
20x2x1.5	2	0.6	1.7	36.3	1140
30x2x1.5	2	0.6	2.0	43.5	1660
50x2x1.5	2	0.6	2.2	56.0	2670



## Jumper wires Y , YV



### Technical data :

- Jumper wires with PVC core insulation acc. to DIN VDE0812 and DIN VDE0815
- Temperature range :  
flexing -5°C to +70°C  
fixed installation -30°C to +70°C

### Cable structure :

- Solid, Plain annealed (Y) or tinned annealed (YV) copper conductor
- PVC core insulation
- Lay length approximately 50 mm
- Colour code as per DIN 47002  
white-brown /white-green /white-yellow /white-blue  
/white-red /white-black /brown-green /brown-yellow  
/brown-blue /brown-black /green-yellow /green-red  
/green-black /yellow-blue /yellow-red /yellow-black  
/grey-red /grey-black /pink-black /pink-violet /blue-red  
/red-black /violet-red .

### Application :

- Jumper wires are used for wiring to the switchboards, amplifiers and dial intercommunicating systems, measuring instruments and data processing apparatus etc. These wires are not permitted to apply as insulation for high power ratings.

Number of wires and conductor/core diameter mm	Insulation thickness mm	Overall diameter mm	Approx. weight kg/km	Max. resistance at 20 °C(Ω/KM)	Operating voltage peak value	Test voltage ac.
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#### Y wires

1x0.6/1.4	0.4	1.4	4.2	65	600	1500
2x0.6/1.4	0.4	2.8	8.5	65	600	1500
3x0.6/1.4	0.4	3.0	12.8	65	600	1500
4x0.6/1.4	0.4	3.4	17.0	65	600	1500
5x0.6/1.4	0.4	3.8	21.4	65	600	1500
1x0.8/1.6	0.4	1.6	6.5	36.6	600	1500
2x0.8/1.6	0.4	3.2	13.3	36.6	600	1500
3x0.8/1.6	0.4	3.4	19.9	36.6	600	1500
4x0.8/1.6	0.4	3.9	26.5	36.6	600	1500
5x0.8/1.6	0.4	4.3	33.2	36.6	600	1500

#### YV wires

1x0.5/0.9	0.2	0.9	2.5	92.2	500	1200
2x0.5/0.9	0.2	1.8	5.0	95	500	1200
3x0.5/0.9	0.2	2.0	7.5	95	500	1200
4x0.5/0.9	0.2	2.2	10	95	500	1200
1x0.5/1.1	0.3	1.1	3.0	92.2	900	2500
2x0.5/1.1	0.3	2.2	6.0	95	900	2500
1x0.6/1.1	0.25	1.1	3.7	64	900	2500
2x0.6/1.1	0.25	2.2	7.5	66	900	2500
3x0.6/1.1	0.25	2.4	11	66	900	2500
4x0.6/1.1	0.25	2.7	15	66	900	2500
5x0.6/1.1	0.25	3.0	19	66	900	2500
1x0.6/1.4	0.4	1.4	4.5	65	900	2500
2x0.6/1.4	0.4	2.8	9.0	66	900	2500
3x0.6/1.4	0.4	3.0	13.5	66	900	2500
4x0.6/1.4	0.4	3.4	18	66	900	2500
5x0.6/1.4	0.4	3.8	23	66	900	2500
1x0.8/1.4	0.3	1.4	6	36	900	2500
2x0.8/1.4	0.3	2.8	12	36.7	900	2500
1x1.0/1.8	0.4	1.8	10	22.8	900	2500
2x1.0/1.8	0.4	3.6	20	23.3	900	2500
1x1.4/2.2	0.4	2.2	17.5	11.6	900	2500
1x1.8/2.8	0.5	2.8	28	7.1	1500	3000



## High frequency coaxial cable (50,75 ohm)



### Technical data :

- High frequency coaxial cables according as JIS C-3501
- Temperature range :**  
flexing -35°C to -80°C
- Min. insulation resistance :**  
10000 Mohm.km
- Test voltage D.C :** 2000 V

### Cable structure :

- Cu / PE / Cu / PVC
- Plain annealed single or stranded copper conductor
- PE insulation
- Braided copper shield
- PVC sheath ,white or gray

### Application :

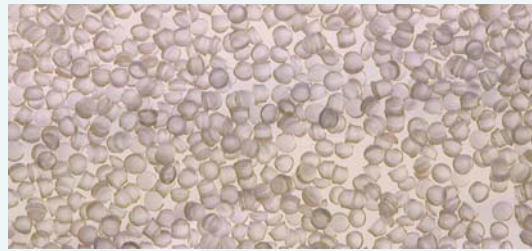
- Coaxial cables are used in high frequency transmission, especially for transmitters and receivers , computers, radio and TV transmissions.
- The varied mechanical, thermal and electronic properties of coaxial cables mean that they can be used up into the GHz levels.

Coaxial cable type	No. x dia. of wire	Insulation thickness mm	Sheath thickness mm	Overall diameter mm	Approx. weight kg/km	Attenuation at 10 Mhz db/km	Impedance ohm	Capacitance at 1 KHz nF/km
1.5C-2V	1 x 0.26	0.67	0.4	2.9	13	96	75	69±4
2.5C-2V	1 x 0.4	1.0	0.5	4.0	22	52	75	69±4
3C-2V	1 x 0.5	1.3	0.8	5.4	42	42	75	67±3
4.5C-2V	1 x 1.0	1.75	0.6	6.4	47	22	75	67±3
5C-2V	1 x 0.8	2.05	0.9	7.4	74	27	75	67±3
5C-2W	1 x 0.8	2.05	1.0	8.3	120	27	75	67±3
7C-2V	7 x 0.4	3.05	1.1	10.4	140	22	75	67±3
10C-2V	7 x 0.5	3.95	1.4	13	220	18	75	67±3

1.5D-2V	7 x 0.18	0.55	0.4	3.0	14	85	50	100±4
2.5D-2V	1 x 0.8	0.95	0.5	4.3	35	45	50	100±4
3D-2V	7 x 0.32	1.05	0.8	5.3	44	47	50	100±4
5D-2V	1 x 1.4	1.7	0.9	7.3	80	27	50	100±4
5D-2W	1 x 1.4	1.7	0.9	8.0	110	27	50	100±4
8D-2V	7 x 0.8	2.7	1.2	11.1	180	20	50	100±4
10D-2V	1 x 2.9	3.4	1.2	13.1	260	14	50	100±4



## PVC granules for different insulations and sheaths of electrical and communication cables



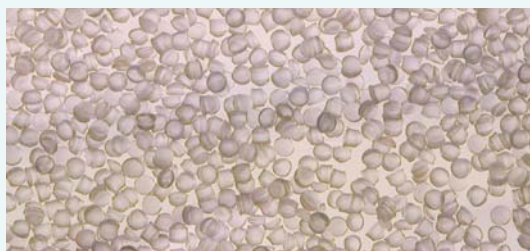
- PVC compound for different insulations and sheaths in electrical and communication cables for temperature range of 70 - 90°C of conductor temperature acc. as IEC 60502 , IEC 60227 , IEC 60189 and TCI.
- PVC granules are available in natural or coloured.
- PVC types : A , C , D , E , ST1 , ST2 , ST4 , ST5 , KHF, KHTI and KHTS

PVC granule type.	A	C	D	E	ST1	ST2
<b>Application</b>	Insulation for cables of 0.6/1 kv	Insulation for non-flexible wires below and including 450/750 V	Insulation for flexible wires below and including 450/750 V	Insulation for heat resistant cables	Sheath for 0.6/1KV cables	Sheath for 0.6/1KV cables

PVC granule type				A	C	D	E	ST1	ST2	
Technical data				A	C	D	E	ST1	ST2	
	No.	Item	Unit							
Non electrical	1-1	Mechanical properties without ageing	tensile strength	N/mm <sup>2</sup>	12.5	12.5	10	15	12.5	12.5
			elongation	%	150	125	150	150	150	150
	1-2	Mechanical properties after ageing	tensile strength	N/mm <sup>2</sup>	12.5	12.5	10	15	12.5	12.5
			variation with samples before ageing	%	±25	±20	±20	±25	±25	±25
			elongation	%	150	125	150	150	150	150
			variation with samples before ageing	%	±25	±20	±20	±25	±25	±25
	1-3	Density	gr/cm <sup>3</sup>	1.48	1.5	1.5	1.4	1.54	1.54	
1-4	Loss of mass	duration 7 days	mg/cm <sup>2</sup>	-	2	2	2	-	1.5	
		in temperature			80° C	80° C	115°C(10days)		100° C	
1-5	Hardness	shore A	84	78	72	78	82	82		
Electrical	2	Volume resistivity at 70 ° C	Ω.cm	10 <sup>10</sup>	10 <sup>10</sup>	10 <sup>10</sup>	10 <sup>10</sup>	-	-	
Thermic	3-1	Permanent working temperature	° C	70	70	70	90	80	90	
	3-2	Melt temperature	° C	150	145	150	160	160	160	



## PVC granules for different insulations and sheaths of electrical and communication cables



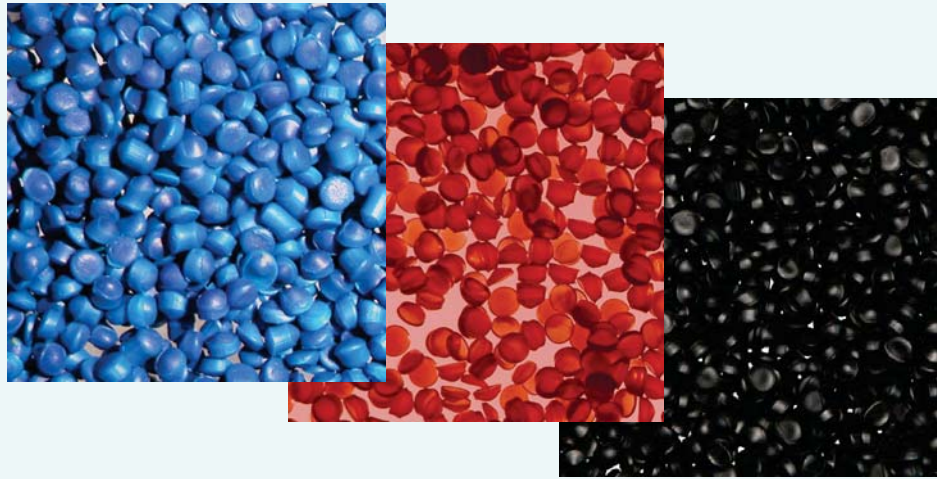
- PVC compound for different insulations and sheaths in electrical and communication cables for temperature range of 70 - 90°C of conductor temperature acc. as IEC 60502 , IEC 60227 , IEC 60189 and TCI.
- PVC granules are available in natural or coloured.
- PVC types : A , C , D , E , ST1 , ST2 , ST4 , ST5 , KHF, KHTI and KHTS

PVC granule type.	ST4	ST5	KHF	KHTI	KHTS
<b>Application</b>	Sheath for fixed installation cables below and including 450/750 V	Sheath for flexible cables below and including 450/750 V	Inner-covering for multicore cables	Insulation for communication cables	Sheath for communication cables

PVC granule type				ST4	ST5	KHF	KHTI	KHTS	
Technical data									
No.	Item		Unit						
Non electrical	1-1	Mechanical properties without ageing	tensile strength	N/mm <sup>2</sup>	12.5	10	10	15	12.5
			elongation	%	125	150	150	150	150
	1-2	Mechanical properties after ageing	tensile strength	N/mm <sup>2</sup>	12.5	12.5	-	15	12.5
			variation with samples before ageing	%	±20	±20	-	±20	±20
			elongation	%	125	125	-	150	150
			variation with samples before ageing	%	±20	±20	-	±20	±20
	1-3	Density	gr/cm <sup>3</sup>	1.48	1.45	1.65	1.4	1.5	
	1-4	Loss of mass	duration 7 days	mg/cm <sup>2</sup>	2	2	-	-	-
			in temperature		80° C	80° C			
	1-5	Hardness	shore A	80	72	60	82	70	
Electrical	2	Volume resistivity at 70 ° C	Ω.cm	-	-	-	-	-	
Thermic	3-1	Permanent working temperature	° C	70	70	70	50	50	
	3-2	Melt temperature	° C	150	145	150	155	160	



## PVC masterbatches



- Masterbatches are basis of PVC compounding with suitable pigments of different colours for electrical and communication cables.They have suitable compatibility with different PVC granules.
- The PVC masterbatch meet fine dispersion required by low and high speed extrusion line up to 1000 m/min
- The black masterbatches are U.V resistance when are added to sheath.
- Dosage of masterbatch 1%
- Density 1.45 gr/cm<sup>3</sup>
- Shore hardness (A) 80±2
- Melt temperature 150°C
- Volume resistivity min. 10<sup>14</sup> Ω.cm at 20°C
- Heat stability 200°C ,100 minutes





## Current carrying capacity

Since capacity of current for certain cross section, from voltage drop and heat dissipation point of view is limited, therefore, choosing the right cross section is always very important in electric networks.

Following tables and graphs are used for choosing the right cross section of wires and cables in different conditions of installation and arrangements.

For different condition the current carrying capacity are given in tables 5, 6, 8, 9 should be multiplied by factors given in following tables.

The maximum permissible temperature in conductors with PVC insulation is 70 °C and for XLPE insulation is 90 °C.





## Current ratings - Conversion factors for deviating ambient temperature

Table 1

☑ Conversion factors for deviating ambient temperature						
Permissible operating temperature	40°C	60°C	70°C	80°C	85°C	90°C
Ambient temperature °C	Conversion factors, used to the current ratings data in tables of the following pages					
10	1.73	1.29	1.22	1.18	1.17	1.15
15	1.58	1.22	1.17	1.14	1.13	1.12
20	1.41	1.15	1.12	1.10	1.09	1.08
25	1.22	1.08	1.06	1.05	1.04	1.04
30	1.00	1.00	1.00	1.00	1.00	1.00
35	0.71	0.91	0.94	0.95	0.95	0.96
40	—	0.82	0.87	0.89	0.90	0.91
45	—	0.71	0.79	0.84	0.85	0.87
50	—	0.58	0.71	0.77	—	0.82
55	—	0.41	0.61	0.71	—	0.76
60	—	—	0.50	0.63	—	0.71
65	—	—	0.35	0.55	—	0.65
70	—	—	—	0.45	—	0.58
75	—	—	—	0.32	—	0.50
80	—	—	—	—	—	0.41
85	—	—	—	—	—	0.29

Table 2

☑ Conversion temperature for heat-resistant cables					
Permissible operating temperature	80°C	90°C	110°C	135°C	180°C
Ambient temperature °C	Conversion factors, used to the current ratings data for heat-resistant cables in the tables of the following pages				
bis 50	1.00	1.00	1.00	1.00	1.00
55	0.91	0.94	1.00	1.00	1.00
60	0.82	0.87	1.00	1.00	1.00
65	0.71	0.79	1.00	1.00	1.00
70	0.58	0.71	1.00	1.00	1.00
75	0.41	0.61	1.00	1.00	1.00
80	—	0.50	1.00	1.00	1.00
85	—	0.35	0.91	1.00	1.00
90	—	—	0.82	1.00	1.00
95	—	—	0.71	1.00	1.00
100	—	—	0.58	0.94	1.00
105	—	—	0.41	0.87	1.00
110	—	—	—	0.79	1.00
115	—	—	—	0.71	1.00
120	—	—	—	0.61	1.00
125	—	—	—	0.50	1.00
130	—	—	—	0.35	1.00
135	—	—	—	—	1.00
140	—	—	—	—	1.00
145	—	—	—	—	1.00
150	—	—	—	—	1.00
155	—	—	—	—	0.91
160	—	—	—	—	0.82
165	—	—	—	—	0.71
170	—	—	—	—	0.58
175	—	—	—	—	0.41

Table 3

☑ Conversion factors for multicore cables with cross-section up to 10 mm <sup>2</sup>	
Number of loaded cores	Conversion factors
5	0.75
7	0.65
10	0.55
14	0.50
19	0.45
24	0.40
40	0.35
61	0.30

Table 4

☑ Conversion factors for reeled cables					
Number of layers on drums	1	2	3	4	5
Conversion factors	0.80	0.61	0.49	0.42	0.38

Note: For spiral-reeling the conversion factor 0,80.



# Current ratings for NYY, NAYY, NYCY, NYCWY, NAYCWY 0.6/1 kv

Table 5

Current carrying capacity in Ampere (A), Laying in ground (20° C)

Nominal Cross-Section mm <sup>2</sup>	Copper conductor					Aluminium conductor				
	NYY			NYCWY		NAYY			NAYCWY	
1.5	30	27	41	31	27	-	-	-	-	-
2.5	39	36	55	40	36	-	-	-	-	-
4	50	47	71	51	47	-	-	-	-	-
6	62	59	90	63	59	-	-	-	-	-
10	83	79	124	84	79	-	-	-	-	-
16	107	102	160	108	102	-	-	-	-	-
25	138	133	208	139	133	106	102	160	108	103
35	164	159	250	166	160	127	123	193	129	123
50	195	188	296	196	190	151	144	230	153	145
70	238	232	365	238	234	185	179	283	187	180
95	286	280	438	281	280	222	215	340	223	216
120	325	318	501	315	319	253	245	389	252	246
150	365	359	563	347	357	284	275	436	280	276
185	413	406	639	385	402	322	313	496	314	313
240	479	473	746	432	463	375	364	578	358	362
300	541	535	848	473	518	425	419	656	397	415
400	614	613	975	521	579	487	484	756	441	474
500	693	687	1125	574	624	558	553	873	489	528
630	777	-	1304	636	-	635	-	1011	539	-
800	859	-	1507	-	-	716	-	1166	-	-
1000	936	-	1715	-	-	796	-	1332	-	-

\* Rated current for direct current systems with a far-distanced return conductor

Table 6

Current carrying capacity in Ampere (A), Laying in Air (30° C)

Nominal Cross-Section mm <sup>2</sup>	Copper conductor					Aluminium conductor				
	NYY			NYCWY		NAYY			NAYCWY	
1.5	21	19.5	27	22	19.5	-	-	-	-	-
2.5	28	25	35	29	26	-	-	-	-	-
4	37	34	47	39	34	-	-	-	-	-
6	47	43	59	49	44	-	-	-	-	-
10	64	59	81	67	60	-	-	-	-	-
16	84	79	107	89	80	-	-	-	-	-
25	114	106	144	119	108	87	82	110	91	83
35	139	129	176	146	132	107	100	135	112	101
50	169	157	214	177	160	131	119	166	137	121
70	213	199	270	221	202	166	152	210	173	155
95	264	246	334	270	249	205	186	259	212	189
120	307	285	389	310	289	239	216	302	247	220
150	352	326	446	350	329	273	246	345	280	249
185	406	374	516	399	377	317	285	401	321	287
240	483	445	618	462	443	378	338	479	374	339
300	557	511	717	519	504	437	400	555	426	401
400	646	597	843	583	577	513	472	653	488	468
500	474	669	994	657	626	600	539	772	556	524
630	858	-	1180	744	-	701	-	915	628	-
800	971	-	1396	-	-	809	-	1080	-	-
1000	1078	-	1620	-	-	916	-	1258	-	-

\* Rated current for direct current systems with a far-distanced return conductor

Table 7

**Conversion factors for multicore cable (≥ 5 cores)**

The conversion factors are to be used for laying the cables in ground or in air, to the values given in above tables.

Numbers of loaded cores n	Laying in ground f	Laying in air f
5	0.70	0.75
7	0.60	0.65
10	0.50	0.55
14	0.45	0.50
19	0.40	0.45
24	0.35	0.40
40	0.30	0.35
61	0.25	0.30



## Power ratings for XLPE-insulated Medium Voltage Power Cables 6/10 kv , 12/20 kv , 18/30 kv

N2XSY  
NA2XSY

N2XS2Y  
NA2XS2Y

N2XS(F)2Y  
NA2XS(F)2Y

Table 8

<input checked="" type="checkbox"/> Current carrying capacity * in Amperes (A) in ground (20° C)												
Conductor material	Copper conductor						Aluminium conductor					
Arrangement												
	6/10 kv		12/20 kv		18/30 kv		6/10 kv		12/20 kv		18/30 kv	
cross section mm <sup>2</sup>	Current ratings in Ampere (A)											
25	157	179	-	-	-	-	-	-	-	-	-	-
35	187	212	189	213	-	-	145	165	-	-	-	-
50	220	249	222	250	225	251	171	194	172	195	174	195
70	268	302	271	303	274	304	208	236	210	237	213	238
95	320	359	323	360	327	362	248	281	251	282	254	283
120	363	405	367	407	371	409	283	318	285	319	289	321
150	405	442	409	445	414	449	315	350	319	352	322	354
185	456	493	461	498	466	502	357	394	361	396	364	399
240	526	563	532	568	539	574	413	452	417	455	422	458
300	591	626	599	633	606	640	466	506	471	510	476	514
400	662	675	671	685	680	695	529	558	535	564	541	570
500	744	748	754	760	765	773	602	627	609	634	616	642

\* This factors are also valid for longitudinally water-tight cable

Table 9

<input checked="" type="checkbox"/> Current carrying capacity *in Amperes (A) in air(30° C)												
Conductor material	Copper conductor						Aluminium conductor					
Arrangement												
	6/10 kv		12/20 kv		18/30 kv		6/10 kv		12/20 kv		18/30 kv	
cross section mm <sup>2</sup>	Current ratings in Ampere (A)											
25	163	194	-	-	-	-	-	-	-	-	-	-
35	197	235	200	235	-	-	153	182	-	-	-	-
50	236	282	239	282	241	282	183	219	185	219	187	219
70	294	350	297	351	299	350	228	273	231	273	232	273
95	358	426	361	426	363	425	278	333	280	332	282	331
120	413	491	416	491	418	488	321	384	323	384	325	382
150	468	594	470	549	472	548	364	432	366	432	367	429
185	535	625	538	625	539	624	418	496	420	494	421	492
240	631	731	634	731	635	728	494	583	496	581	496	578
300	722	831	724	830	725	828	568	666	569	663	568	659
400	827	920	829	923	831	922	660	755	660	753	650	750
500	949	1043	953	1045	953	1045	767	868	766	866	764	861

\* This factors are also valid for longitudinally water-tight cable



## Calculation Factors

### 1. Cable laid into the ground

At operation conditions which deviate from normal with regard to thermal resistance of the ground, the ambient temperature or with the laying of a number of cables in parallel, one should apply calculation factors according to Tables are subscribed .

However, in cases where cables laid into the ground are continuously loaded with the same current, then current strength should be multiplied by the factor 0.75 as specified in Tables 5 to 9.

On the other hand, the ground can be excessively dried out and the life of cable considerably reduced due to increase of thermal resistance.

This conditions should not be taken into consideration if drying of the ground is considered by increasing of heat resistance of ground to sufficiently great value and the correction is made by the factor as specified in Table 15 .

If the cable is covered with special protectives and interstices and cable surround sufficiently filled with sand, it should be necessary to take a factor of 0.9 .

If the interstices are not filled with sand sufficiently and there are air spaces a factor of 0.8 should be taken.

### 2. Cable in duct, tube, block, etc.

In as much as cooling conditions differ very much in these conditions the permissible current ratings should be calculated for each individual case.

### 3. Cable in the air

If cables operate at ambient temperatures other than 30°C or are laid in groups, calculation factors in Tables 14 to 16 are applied.

For cable in the air which contrary to assumption is laid on surfaces, current ratings as specified in Tables 5 to 9 are reduced by applying the factor of 0.95. This reduction has already been carried out in Tables 15 & 16 .

The dependance of current ratings from heat resistance of ground.

If heat resistance of ground deviates from 100 °C.cm/W, it is necessary to multiply current ratings by factor A (for cross-section) and factor B (for type and voltage) as specified in Table 5 to 9 .

Table 10

Specific ground resistance C.cm/W	70	100	120	150	200	250	300
Nominal cross-section mm <sup>2</sup>	Factor A						
Up to 25	1.11	1	0.94	0.87	0.78	0.72	0.67
From up to 95	1.13	1	0.93	0.86	0.76	0.70	0.64
From 120 - 240	1.14	1	0.93	0.85	0.76	0.69	0.63
From 300 up to 500	1.15	1	0.92	0.85	0.75	0.68	0.63
Type and voltage	Factor B						
Three- and four-core cable, U=1 kv	1	1	1	1	1	1	1
Two-core cable, U=1 kv	0.98	1	1.01	1.01	1.02	1.02	1.03
Single-core cable d. c., U=1 kv	0.98	1	1.01	1.01	1.02	1.02	1.03
Three-core cable with separately screened cores, U=6 kv and 10 kv	0.97	1	1.01	1.02	1.03	1.04	1.05
Three unarmoured single-core cables, U=1 kv , 6 kv and 10 kv	1.01	1	1.00	0.98	0.97	0.97	0.96



Current rating calculation factors independent of ground temperature

Table 11

Ambient temperature	15° C	20° C	25° C	30° C	35° C	40° C
For cables	Calculation Factors					
U = 1 kv and 6 kv	1.05	1.00	0.95	0.89	0.84	0.77
U = 10 kv	1.05	1.00	0.94	0.88	0.82	0.75

Current rating calculation factors of single-core and d.c. cables, as well as multicore cables when laying a number of cables in the ground. The distance between cables approx. 7 cm. (brick thickness)

Table 12

Number of cables in trench	2	3	4	5	6	8	10
Calculation factors. valid for values from Tables 5,6,8 and 9	0.85	0.75	0.68	0.64	0.60	0.56	0.53

Current rating calculation factors of single-core cables in three-phase system when laying a number of cables in the ground.

Table 13

Number of systems in trench	2	3	4
For laying of systems side by side at a distance of 7 cm.	0.82	0.74	0.68
When laying in bunch, at the distance between bunches of 25 cm.	0.85	0.77	0.72

The dependance of current ratings from ambient temperature when installing cables in the air .

Table 14

Ambient temperature	25° C	30° C	35° C	40° C
Rated voltage	Calculation Factors			
U = 1 kv and 6 kv	1.06	1.00	0.94	0.87
U = 10 kv	1.07	1.00	0.93	0.85



Current rating when installing a number of cables in the air for single-and multicore cables for d.c. systems. Calculation factors for loading values according to Tables 5 and 6 .

Table 15

Way of cable laying	Laying in the same plane. Interstice = cable diameter ( d ). Distance from wall 2 cm						
Number of cables side by side	1	2	3	6	9		
Cables laid on ground	0.95	0.90	0.88	0.85	0.84		
Cables laid in racks (air circulation prevented)	Number of racks 1	0.95	0.90	0.88	0.85	0.84	
	2	0.90	0.85	0.83	0.81	0.80	
	3	0.88	0.83	0.81	0.79	0.78	
	6	0.86	0.81	0.79	0.77	0.76	
Cables laid on brackets	Number of brackets 1	1.00	0.98	0.96	0.93	0.92	
	2	1.00	0.95	0.93	0.90	0.89	
	3	1.00	0.94	0.92	0.89	0.88	
	6	1.00	0.93	0.90	0.87	0.86	
Number of cables one above the other	1	2	3	6	9		
Cables laid on supports or fixed to wall	1.00	0.93	0.90	0.87	0.86		
Way of laying for wich it is not necessary to make correction*	Number of cables side by side is arbitrary						

\* These data are valid only in case that ambient temperature has not been changed considerably due to losses in cables.



Table 15 (cont...)

Way of cable laying	Cables in contact reciprocally and to wall						
Number of cables side by side	1	2	3	6	9		
Cables laid on ground	0.90	0.84	0.80	0.75	0.73		
Cables laid in racks (air circulation prevented)	Number of racks						
	1	0.95	0.84	0.80	0.75	0.73	
	2	0.95	0.80	0.76	0.71	0.69	
	3	0.95	0.78	0.74	0.70	0.68	
Cables laid on brackets	Number of brackets						
	1	0.95	0.84	0.80	0.75	0.73	
	2	0.95	0.80	0.76	0.71	0.69	
	3	0.95	0.78	0.74	0.70	0.68	
Cables laid one above the other	1	2	3	6	9		
Cables laid on supports or fixed to wall	0.95	0.78	0.73	0.68	0.66		
Way of laying for which it is not necessary to make correction*	Number of cables one above the other is arbitrary						

\* These data are valid only in case that ambient temperature has not been changed considerably due to losses in cables.





Current rating calculation factors when laying a number of cables in parallel in the air for single-core cables in three-phase systems. Calculation factors of cable loading values in the air according to Tables 5 and 6.

Table 16

Way of cable laying	Laying in the same plain. Intersticed distance from wall 2 cm.				
Number of cables side by side	1	2	3		
Cables laid on ground	0.92	0.89	0.88		
Cables laid in racks (air circulation prevented)	Number of racks 1	0.92	0.89	0.88	
	2	0.87	0.84	0.83	
	3	0.84	0.82	0.81	
	6	0.82	0.80	0.79	
Cables laid on brackets	Number of cables on brackets 1	1.00	0.97	0.96	
	2	0.97	0.94	0.93	
	3	0.96	0.93	0.92	
	6	0.94	0.91	0.90	
Number of cables one above the other for which it is not necessary to make correction*	When in the same plain with increased distances, the reduced reciprocal heating is compensated by the increased losses in electric screens. Thus other data can not be specified, except those for which correction is not necessary.				
Number of systems one above the other  cables laid on supports or fixed to wall	1	2	3		

\* These data are valid only in case that ambient temperature has not been changed considerably due to losses in cables.



Table 16 (cont...)

Way of cable laying	Laying in triangular bunches. Intersticed distance from wall 2 cm.			
Number of cables side by side	1	2	3	
Cables laid on ground	0.95	0.90	0.88	
Number of racks 1 2 Systems laid in racks (air circulation prevented) 3 6	0.95 0.90 0.88 0.86	0.90 0.85 0.83 0.81	0.88 0.83 0.81 0.79	
Number of cables brackets 1 2 Systems laid on brackets 3 6	1.00 1.00 1.00 1.00	0.98 0.95 0.94 0.93	0.96 0.93 0.92 0.90	
Way of layings for which correction is not necessary *				
Number of systems one above the other systems laid on supports or fixed to wall	1 0.89	2 0.86	3 0.84	

\* These data are valid only in case that ambient temperature has not been changed considerably due to losses in cables.



## The comparison of cables with copper and aluminium conductors

Three essential particulars are very important for a proper choice of cable cross-section, namely: electrical resistance, permissible current ratings and permissible short circuit current. The related proportions of these electrical values for cables with aluminium and copper conductors are specified in Tables 17 and 18.

Tables can be useful for selecting the corresponding cables cross-sections for aluminium and copper conductors.

Table 17

<input checked="" type="checkbox"/> Cables for rated voltage 1 kv				
Copper cable cross-section mm <sup>2</sup>	Aluminium cable cross-section mm <sup>2</sup>	Permissible current ratings Al/Cu	Permissible short circuit current Al/Cu	Resistance ratio $\frac{R_{Cu}}{R_{Al}}$
1	2	3	4	5
4	4	0.78	0.65	0.61
	6	0.98	0.98	0.92
6	6	0.78	0.65	0.61
	10	1.04	1.09	1.02
10	10	0.78	0.65	0.61
	16	1.01	1.04	0.98
16	16	0.78	0.65	0.61
	25	1.00	1.02	0.95
25	25	0.77	0.65	0.61
	35	0.92	0.91	0.85
	50	1.12	1.30	1.22
35	35	0.78	0.65	0.61
	50	0.94	0.94	0.87
	70	1.13	1.32	1.22
50	50	0.79	0.65	0.61
	70	0.95	0.92	0.85
	95	1.16	1.24	1.16
70	70	0.76	0.65	0.61
	95	0.94	0.89	0.83
	120	1.07	1.12	1.05
95	95	0.78	0.65	0.61
	120	0.89	0.82	0.77
	150	1.00	1.03	0.96
120	120	0.78	0.65	0.61
	150	0.87	0.80	0.76
	185	0.98	1.00	0.94
150	150	0.78	0.65	0.61
	185	0.88	0.80	0.75
	240	1.01	1.08	0.98
185	185	0.78	0.65	0.61
	240	0.90	0.85	0.79
	300	1.03	1.05	0.99
240	240	0.78	0.65	0.76
	300	0.88	0.81	0.76
	400	1.01	1.08	1.02



## The comparison of cables with copper and aluminium conductors

Table 18

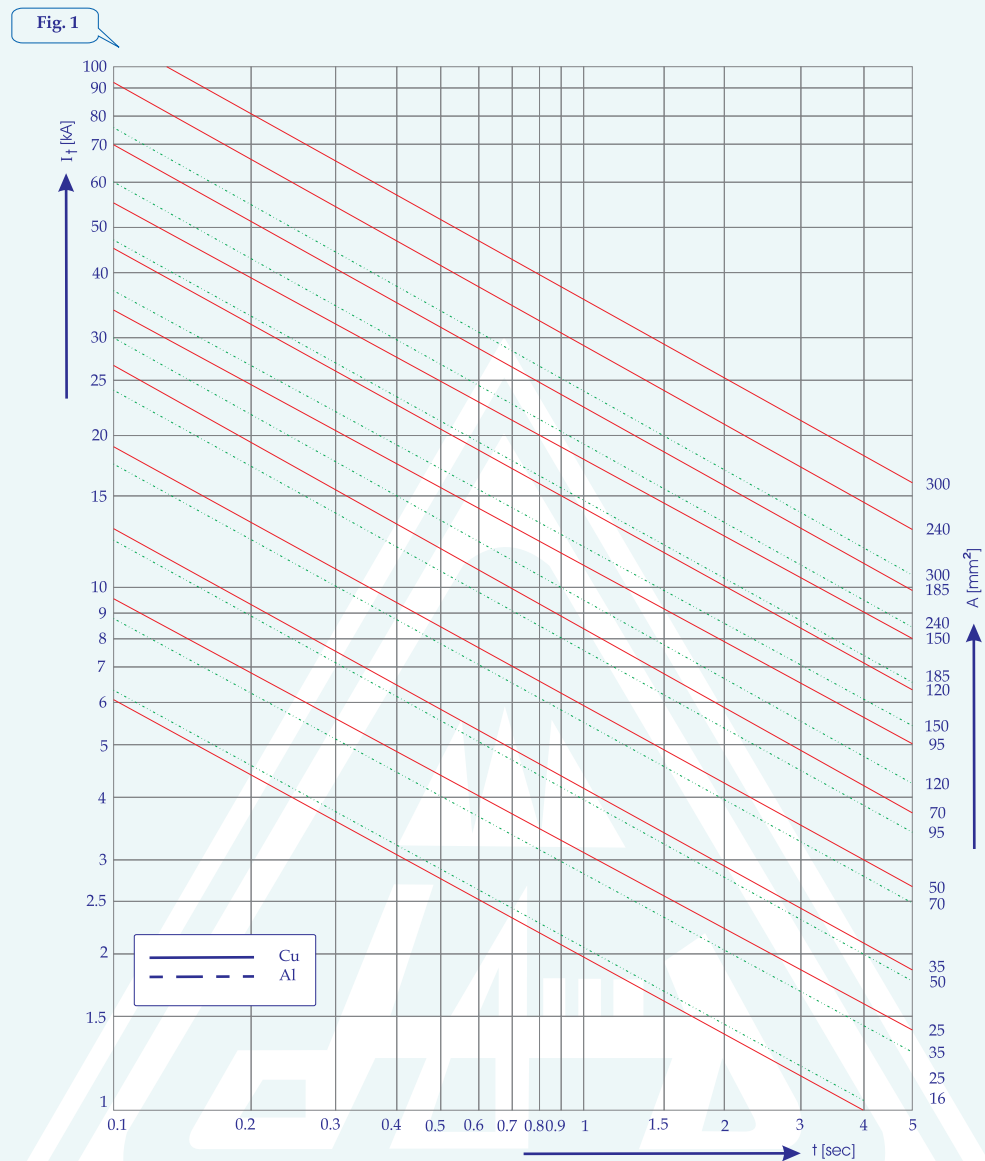
<input checked="" type="checkbox"/> Cables for rated voltage 10 kv				
Copper cable cross-section mm <sup>2</sup>	Aluminium cable cross-section mm <sup>2</sup>	Permissible current ratings Al/Cu	Permissible short circuit current Al/Cu	Resistance ratio $\frac{R_{Cu}}{R_{Al}}$
1	2	3	4	5
10	10	0.78	0.65	0.61
	16	1.00	1.05	0.98
16	16	0.78	0.65	0.61
	25	0.99	1.02	0.95
25	25	0.77	0.65	0.61
	35	0.92	0.91	0.85
35	35	0.76	0.65	0.61
	50	0.90	0.93	0.87
	70	1.10	1.30	1.22
50	50	0.77	0.65	0.61
	70	0.94	0.92	0.85
	95	1.12	1.24	1.16
70	70	0.76	0.65	0.61
	95	0.91	0.89	0.83
	120	1.03	1.11	1.05
95	95	0.78	0.65	0.61
	120	0.88	0.83	0.77
	150	1.00	1.04	0.96
120	120	0.77	0.65	0.61
	150	0.88	0.85	0.76
	185	1.00	1.01	0.94
150	150	0.77	0.65	0.61
	185	0.88	0.81	0.75
	240	0.99	1.05	0.98
185	185	0.79	0.66	0.61
	240	0.89	0.85	0.79
	300	1.00	1.07	0.99
240	240	0.78	0.65	0.61
	300	0.88	0.82	0.76
	400	1.01	1.09	1.02



## Permissible short circuit currents

The insulation resistance against high temperatures which appear during short circuits in the electrical network determine the temperature limit of short circuit to which the cable must be designated in size.

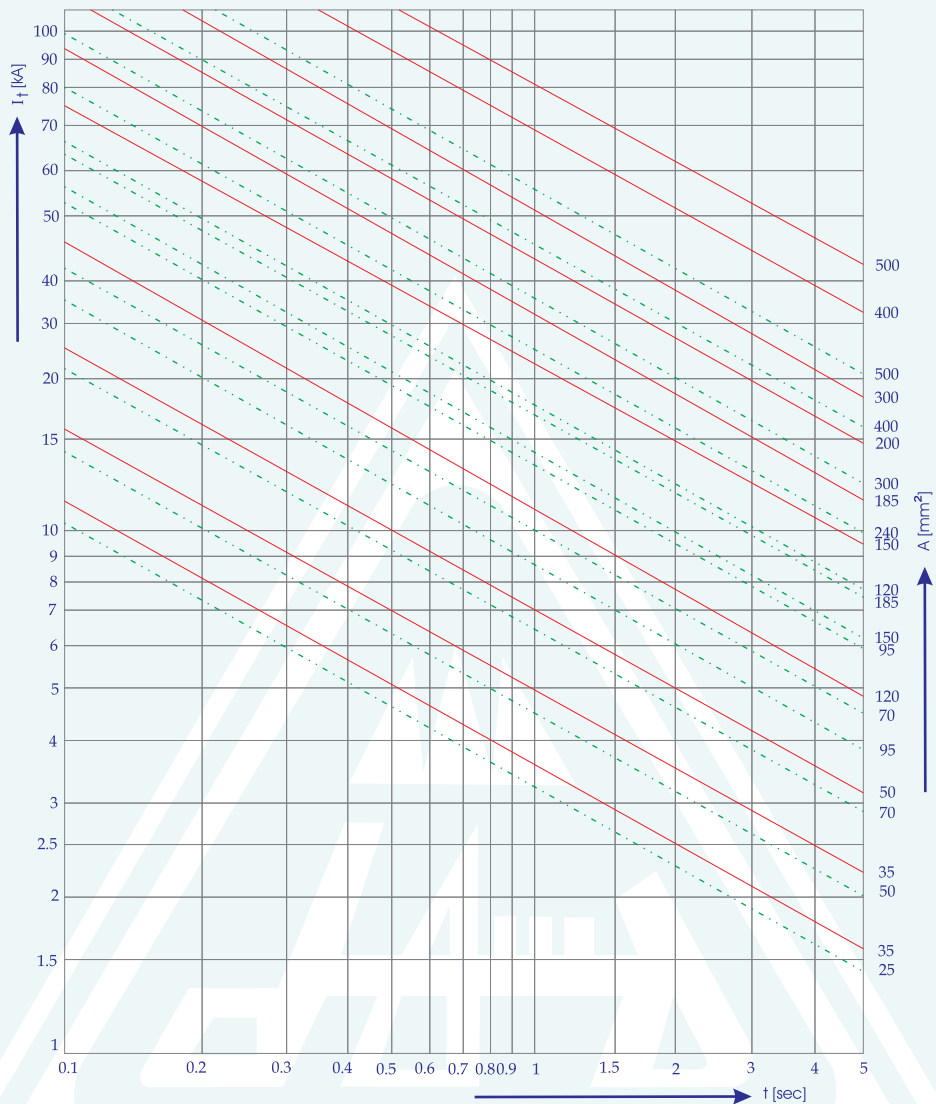
The permissible short circuit current for PVC insulated cables with rated voltage 1-10 KV in relation to the disconnection times is shown in Fig. 1





## Permissible short-circuit current for XLPE insulated cables for 1-30 KV

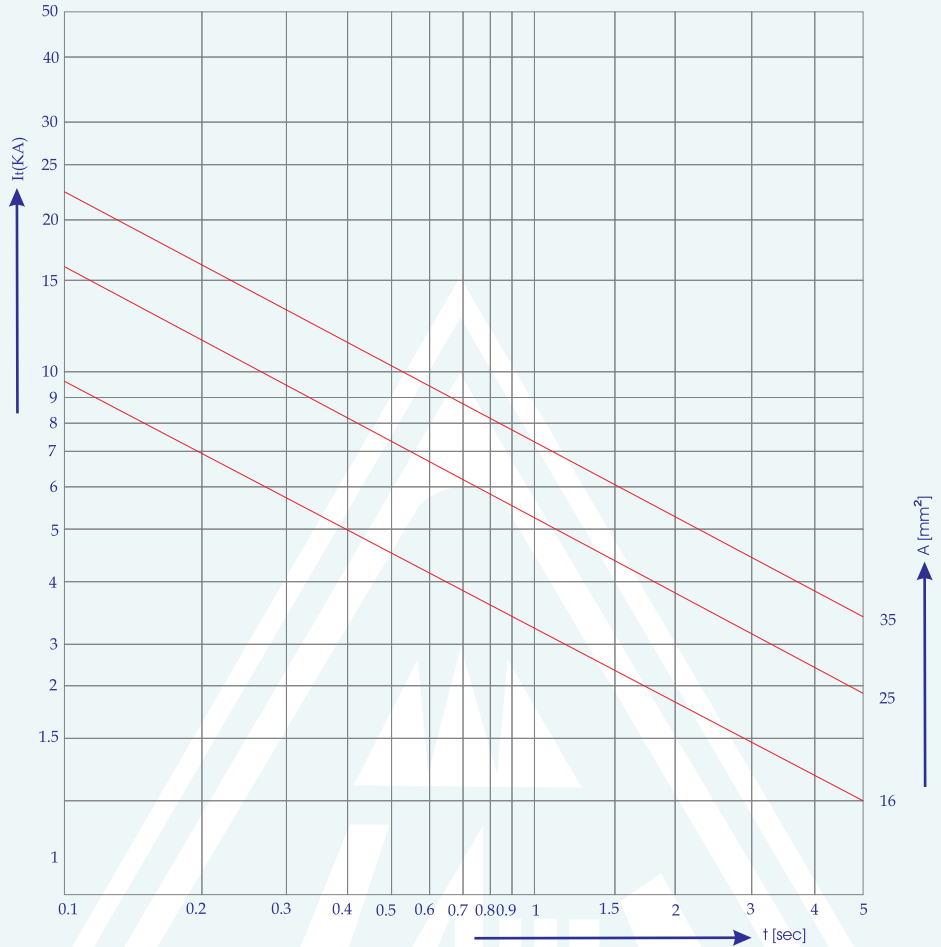
Fig. 2





## Permissible short-circuit current for various cross-sections of screens

Fig. 3



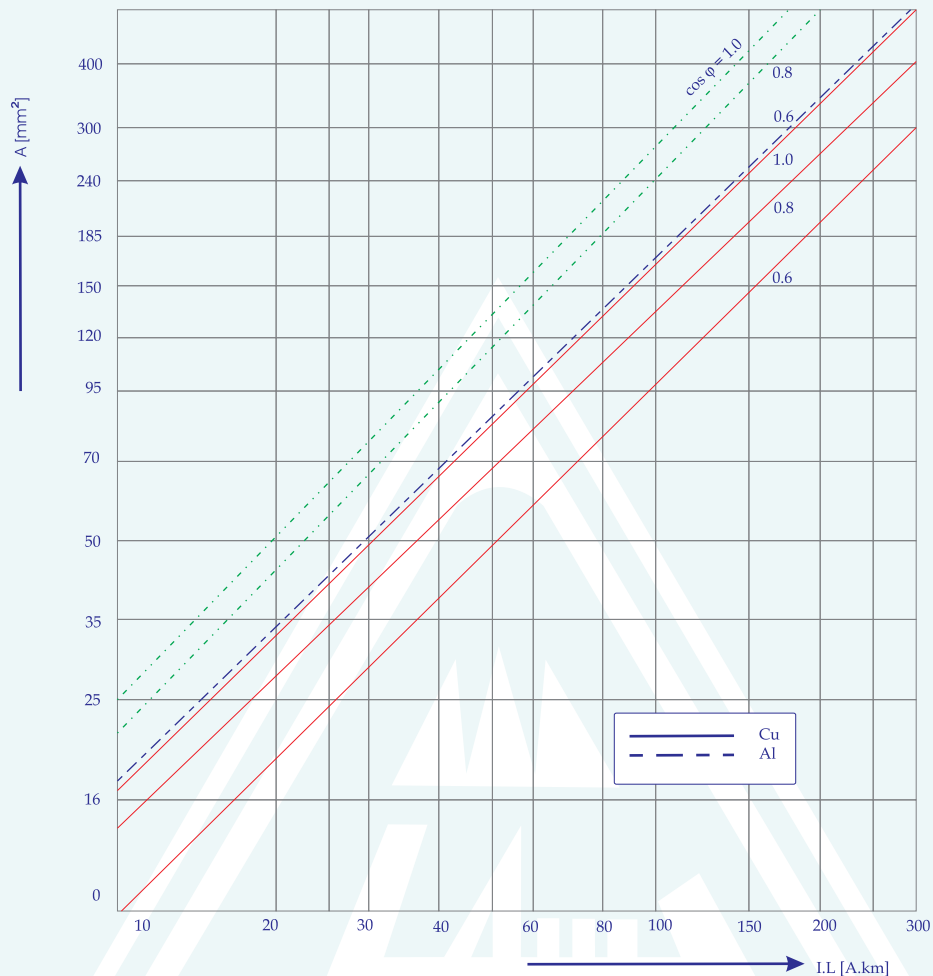


## Voltage drop

In distribution of electrical energy the cross section of low voltage cables are not determined only by their permissible current capacity - but specified voltage drop should be considered too. The cross section of low voltage cables can be read in relation to the product of current and length of the transmission cable (I.L) at a voltage drop of 5% for copper or aluminium conductor cables.

Fig. 4

For 3 phase low voltage cables 220/380 volt with 5% voltage drop.







## Capacitance

Table 25

<input checked="" type="checkbox"/> PVC - insulated cables		
Nominal cross section of conductor mm <sup>2</sup>	Nominal voltage 3.6/6 KV μF/KM <sup>1</sup>	Nominal voltage 6/10 KV μF/KM <sup>1</sup>
25	0.30	0.35
35	0.32	0.33
50	0.32	0.43
70	0.35	0.43
95	0.38	0.50
120	0.43	0.53
150	0.45	0.63
185	0.50	0.70
240	0.55	0.33
300	0.60	0.92

1) The figures are valid for a temperature of 20°C

Table 26

<input checked="" type="checkbox"/> XLPE - insulated cables				
Nominal cross section of conductor mm <sup>2</sup>	Nominal voltage 6/10 KV μF/KM	Nominal voltage 8.7/15KV μF/KM	Nominal voltage 12/20 KV μF/KM	Nominal voltage 18/80 KV μF/KM
35	0.22	0.17	0.16	—
50	0.24	0.19	0.17	0.13
70	0.28	0.22	0.19	0.15
95	0.31	0.24	0.21	0.16
120	0.33	0.26	0.23	0.18
150	0.36	0.28	0.25	0.19
185	0.39	0.31	0.27	0.20
240	0.44	0.34	0.30	0.22
300	0.48	0.37	0.32	0.24
400	0.55	0.42	0.36	0.27
500	0.61	0.46	0.40	0.30

For armoured cables the figures are to be increased by 10%



## Inductive resistance of PVC insulated cables at 50 Hz

Table 27

Nominal cross section of conductor mm <sup>2</sup>	Nominal voltage 0.6/1 KV multicore mH/KM	Nominal voltage 0.6/1 KV 1-core mH/KM	Nominal voltage 3.6/6 KV 3-core mH/KM	Nominal voltage 3.6/6 KV 1-core mH/KM2	Nominal voltage 6/10 KV 3-core mH/KM	Nominal voltage 6/10 KV 1-core mH/KM
25	0.082	0.103	0.107	0.137	0.122	0.127
35	0.079	0.098	0.101	0.131	0.116	0.119
50	0.078	0.095	0.097	0.121	0.114	0.113
70	0.075	0.090	0.092	0.117	0.107	0.107
95	0.075	0.088	0.088	0.112	0.103	0.104
120	0.073	0.085	0.085	0.107	0.099	0.100
150	0.073	0.084	0.083	0.105	0.096	0.097
185	0.073	0.084	0.081	0.102	0.093	0.094
240	0.072	0.082	0.078	0.097	0.089	0.093
300	0.072	0.081	0.077	0.095	0.087	0.091
400	—	0.079	—	0.092	—	0.088
500	—	0.079	—	0.089	—	0.085

1) For armoured cables the figures are to be increased by 10% 2) Trefoil touching arrangement

## Inductive resistance of XLPE and PE insulated cables at 50 Hz

Table 28

Nominal cross section of conductor mm <sup>2</sup>	0.6/1 KV single-core mH/KM	6/10 KV single-core mH/KM	8.7/15 KV single-core mH/KM	12/20 KV single-core mH/KM	18/30 KV single-core mH/KM
35	—	0.133	0.139	0.144	—
50	0.088	0.127	0.132	0.137	0.146
70	0.085	0.119	0.124	0.129	0.137
95	0.082	0.114	0.118	0.123	0.131
120	0.082	0.109	0.114	0.118	0.125
150	0.082	0.106	0.110	0.144	0.121
185	0.082	0.102	0.106	0.110	0.117
240	0.079	0.098	0.102	0.105	0.112
300	—	0.095	0.099	0.102	0.108
400	—	0.091	0.095	0.098	0.103
500	—	0.089	0.092	0.094	0.100

1) For armoured cables the figures are to be increased by 10% 2) Trefoil touching arrangement

Table 29

Nominal cross section of conductor mm <sup>2</sup>	Nominal voltage 0.6/1 KV multicore mH/KM	Nominal voltage 6/10 KV multicore mH/KM	Nominal voltage 8.7/15 KV multicore mH/KM	Nominal voltage 12/20 KV multicore mH/KM	Nominal voltage 18/30 KV multicore mH/KM
35	0.075	—	—	—	—
50	0.072	0.110	0.117	0.123	0.135
70	0.072	0.103	0.110	0.115	0.127
95	0.069	0.099	0.105	0.110	0.121
120	0.069	0.095	0.101	0.106	0.116
150	0.069	0.092	0.098	0.102	0.113
185	0.069	0.090	0.095	0.099	0.109
240	0.069	0.087	0.091	0.095	0.104
300	—	0.084	0.089	0.092	0.101

For armoured cables the figures are to be increased by 10%



## Colour code according to DIN VDE 0293

Table 21

<input checked="" type="checkbox"/> <b>Multicore flexible cables</b>		
Number of cores	Cores <u>with</u> green-yellow protective conductor (-J)	Cores <u>without</u> green-yellow protective conductor (-O)
2	—	brown / blue
3	green-yellow / brown / blue	black / blue / brown
4	green-yellow / black / blue / brown	black / blue / brown / black
5	green-yellow / black / blue / brown / black	black / blue / brown / black / black
6 and more	green-yellow / others black with white numbering	black with white numbering

Table 22

<input checked="" type="checkbox"/> <b>Multicore cables for fixed installation</b>		
Number of cores	Cores <u>with</u> green-yellow protective conductor (-J)	Cores <u>without</u> green-yellow protective conductor (-O)
2	green-yellow / black *	black / blue
3	green-yellow / black / blue	black / blue / brown
4	green-yellow / black / blue / brown	black / blue / brown / black
5	green-yellow / black / blue / brown / black	black / blue / brown / black / black
6 and more	green-yellow / others black with white numbering	black with white numbering

\* This type is according to DIN VDE 0100 part 540, table ??? valid only for copper cross-section of 10 mm<sup>2</sup> and more or Alu 16 mm<sup>2</sup>

Table 23

<input checked="" type="checkbox"/> <b>Multicore cables with <u>concentric conductor</u> for fixed installation</b>		<u>Single core cables</u>
Number of cores	Core markings	The core-colour of single core sheathed cables is <b>black</b> or <b>green-yellow</b> .
2	black / blue	* This type contains altogether 6 conductors , see DIN VDE 0293 section 5,1 ** see DIN VDE 0293 section 5,1
3	black / blue / brown	
4	black / blue / brown / black	
5	black with white numbering *	
6 and more	black with white numbering **	

Table 24

<input checked="" type="checkbox"/> <b>Core marking with numbering (in direction to longitudinal axis)</b> Height and gap of numbers				
Core-nominal- $\emptyset$ mm	e * mm	h mm	i mm	d mm
$D \leq 2,4$	$\geq 0,6$	$\geq 2,3$	ca. 2	$\leq 50$
$2,4 < D \leq 5,0$	$\geq 1,2$	$\geq 3,2$	ca. 3	$\leq 50$
$5,0 < D$	$\geq 1,6$	$\geq 4,6$	ca. 4	$\leq 50$

e: breadth of number  
 h: height of number  
 i: gap between two successive numbers and between number and dash  
 d: gap between two successive numbers

\* when the number is only 1, the smallest breadth is half of the given dimension to this column.





Chemical Resistance	Concentration (%)	Temperature up to ... °C	PVC										PE	PUR	H	Silicone	Neoprene Rubber	Teflon
			JZ-500/600/750/JB/OZ-BL/JZ-HF/PVC-Flach, TRONIC (LHY), SUPERTRONIC-PVC	JZ-603/JZ-603-CY/LI-TRC-Y/PAAR-CY-OZ/N03W5-F/CEI 20-22	JZ-603/JZ-603-CY/LI-TRC-Y/PAAR-CY-OZ/N03W5-F/CEI 20-22	NVSI-Y, NVSI-YCY, NISY, NISCY, NSY, NSYCY, H05W5-F, H05W4V5-K	MULTIFLEX-Plus, LHY, Trago, Lht-25, BAUFLEX BUS-cables-PVC, DAT-cables-PVC	F-CY-JZ, Y-CY-JZ, JZ-HF-CY, Y(S)Y, J-Y, JE-Y(S), S-Y, S-Y(S)Y, TOPFLEX-PVC	ESUY, LHY, PVC-Single cores, EDV-PLMH-CY ESY, LIFDY, TUBFLEX/CY	H 05 V-K, H 07 V-K, H 03 W-F, H 05 W-F	THERM 120, THERM 105, H05V2-K, H07V2-K	COAXIAL-cable (PB), L2-BUS-cable (PB), A-2Y(L)2Y, A-2Y(L)2Y, HELUCOM® ... 2Y	PUR-JZ, PUR-JZ-HF, TOPFLEX-PUR, ROBOFLEX, SUPERTRONIC-PUR, MULTIFLEX-PUR, TOPSERV®	JZ-500-HMH/HXMHX, N2XH, H07Z2-K, RC-FH	SHF, SHF/CL-P, SF, SID, SHF, SHF/CL, SID/CL, SHF-C-SI, JZ-LS, FZ-LSI, N2GMH2G	H01N2D/E, H 05/H 07-, A 05/A 07 RN-F	FEF-6Y, PTFE-5Y, Compensating cables-FEP	

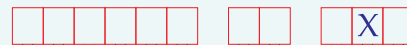
Substance	Concentration (%)	Temperature up to ... °C	JZ-500/600/750/JB/OZ-BL/JZ-HF/PVC-Flach, TRONIC (LHY), SUPERTRONIC-PVC	JZ-603/JZ-603-CY/LI-TRC-Y/PAAR-CY-OZ/N03W5-F/CEI 20-22	JZ-603/JZ-603-CY/LI-TRC-Y/PAAR-CY-OZ/N03W5-F/CEI 20-22	NVSI-Y, NVSI-YCY, NISY, NISCY, NSY, NSYCY, H05W5-F, H05W4V5-K	MULTIFLEX-Plus, LHY, Trago, Lht-25, BAUFLEX BUS-cables-PVC, DAT-cables-PVC	F-CY-JZ, Y-CY-JZ, JZ-HF-CY, Y(S)Y, J-Y, JE-Y(S), S-Y, S-Y(S)Y, TOPFLEX-PVC	ESUY, LHY, PVC-Single cores, EDV-PLMH-CY ESY, LIFDY, TUBFLEX/CY	H 05 V-K, H 07 V-K, H 03 W-F, H 05 W-F	THERM 120, THERM 105, H05V2-K, H07V2-K	COAXIAL-cable (PB), L2-BUS-cable (PB), A-2Y(L)2Y, A-2Y(L)2Y, HELUCOM® ... 2Y	PUR-JZ, PUR-JZ-HF, TOPFLEX-PUR, ROBOFLEX, SUPERTRONIC-PUR, MULTIFLEX-PUR, TOPSERV®	JZ-500-HMH/HXMHX, N2XH, H07Z2-K, RC-FH	SHF, SHF/CL-P, SF, SID, SHF, SHF/CL, SID/CL, SHF-C-SI, JZ-LS, FZ-LSI, N2GMH2G	H01N2D/E, H 05/H 07-, A 05/A 07 RN-F	FEF-6Y, PTFE-5Y, Compensating cables-FEP	
Aceton		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ethyl alcohol	100	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ethyl chloride		50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ethylene glycol		100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Formic acid	30	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Aniline		50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Petrol		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Benzene		50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Succinic acid, wat.	colds.	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Brake fluid		100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Butane		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Butter		50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Chlorobenze		30	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Chloroprene		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Diethylether		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Diethylprestone		50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Diesel oil			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Glacial acetic acid	20	50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Acetic acid	20		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Freon		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Gear oil		100	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Glycerin	each	50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Hydraulic oil		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Isopropyl alcohol	100	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Kerosene		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Lactic acid		10	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Machine oil		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Methanol		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Methyl alcohol	100		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Methylen chloride		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Mineral oil			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Motor oil		120	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Olive oil		50	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Oxal acid	colds.	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Paraffin oil			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Vegetable oils			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Vegetable fats			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Cutting oil			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Tar acid		20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Carbon tetrachloride	100	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Toluene			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Trichloroethene	100	20	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Tartaric acid, wat.			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Citric acid			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● resistant  
 ○ conditionally resistant  
 ○ not resistant  
 \* for individual case, please verify  
 each = reach concentration  
 colds. = cold saturated  
 wat. = watery, liquid  
 The information mentioned in this summary is given to the best of our own knowledge and based upon our long standing experience. But we would like to direct your attention to the fact, that the information is given without obligation. A final judgement can only be made in practice.



# Designation code for power cables according to DIN VDE 0271/0276

## Construction reference



### Identifications of designation

- N DIN VDE standard
- (N) similar to DIN VDE standard

### Conductor material

- A aluminium conductor
- copper conductor

### Insulating materials

- Y PVC
- 2X cross-linked PE (XLPE)
- impregnated paper

### Concentric conductor (screen)

- C concentric conductor of copper
- CW concentric conductor of copper in waveconal formation
- CE concentric conductor of copper over each individual core
- S screen of copper wires
- SE screen of copper wires over each individual core
- H conductive layers
- (F) longitudinally water-proof screen

### Armouring

- B steel tape armouring
- F armour of galvanized flat steel wires
- G counter helix of galvanized steel tape
- R armour of galvanized round steel wires

### Sheath Material

- A oversheath made of fibrous material
- K lead sheath
- KL aluminium sheath
- Y PVC
- 2Y PE

### Protective Conductor

- J with protective conductor
- O without protective conductor

### Number of cores

### Conductor cross section in mm<sup>2</sup>

### Conductor type

- r... circular conductor
- s... sector conductor
- o... oval conductor
- ..e... circular ,solid conductor
- ..m stranded conductor
- ..h hollow circular conductor
- v compact conductor

### Rating Voltage

- 0.6/1 kv
- 3.6/6 kv
- 6.0/10 kv
- 12/20 kv
- 18/30 kv

#### Examples :

NA2XS2Y 1x35 RM/16 6/10 kv

Single core XLPE-insulated cable with PE-sheath according to standard, circular, stranded aluminium conductor with nominal cross-section 35 mm<sup>2</sup>, covered with copper-screen 16 mm<sup>2</sup> and rating voltage (U<sub>0</sub>/U) 6/10 kv

NYJ-J 12x1.5 RE 0.6/1 kv

Cable according to standard, PVC-insulated, sheath PVC, with green-yellow marked core, 12 cores with nominal cross-section 1.5 mm<sup>2</sup>, circular conductor, solid, rating voltage 0.6/1 kv



# Designation code for telephone cables jumper wires and stranded hook-up wires

## Construction reference



## Basic cable type with additional information

<b>A</b>	outdoor cable	<b>IE</b>	installation cable for industrial electronic
<b>AB</b>	outdoor cable with lightning protection requirements	<b>IE-H</b>	installation cable for industrial electronic, halogen-free
<b>AJ</b>	outdoor cable with induction protection requirements	<b>S</b>	switchboard cable
<b>G</b>	mining cable	<b>T</b>	distribution cable
<b>I</b>	installation cable	<b>YV/Li<sub>m</sub></b>	jumper wires/hook-up wires

## Insulation

<b>P</b>	dry paper	<b>3Y</b>	- Styroflex
<b>Y</b>	PVC (polyvinylchloride)	<b>5Y</b>	- PTFE
<b>2Y</b>	PE (polyethylene)	<b>6Y</b>	- FEP
<b>02Y</b>	foamed PE (cellular)	<b>7Y</b>	- ETFE
<b>02YS</b>	foam-skin insulation		

## Screening

<b>C</b>	screen of braided copper wires	<b>(L)</b>	aluminium tape
<b>D</b>	copper screen, helically stranded	<b>(ms)</b>	magnetic screen steel tape
<b>F</b>	filling of cable core with petrol-jelly	<b>(St)</b>	screen of plastic coated metallic foil
<b>(K)</b>	screen of copper tape with PE-inner sheath	<b>(z)</b>	high tensile steel wire braiding

## Sheath Material

<b>L</b>	smooth aluminium sheath	<b>M</b>	lead sheath
<b>(L)2Y</b>	copolymer coated aluminium moisture barrier sheath	<b>Mz</b>	lead alloy sheath
<b>LD</b>	corrugated aluminium sheath	<b>W</b>	corrugated steel sheath

## Protective coating

<b>Y</b>	PVC sheath	<b>2Y</b>	PE sheath
<b>Yv</b>	reinforced protective sheath of PVC	<b>2Yv</b>	reinforced protective PE sheath
<b>Yw</b>	PVC sheath heat-resistant	<b>E</b>	compound with embedded plastic tape
<b>Yu</b>	PVC flame resistant (non-flammable)	<b>C</b>	protective covering of jute and compound

## Number of stranding elements

<b>..x1x</b>	single core	<b>..x4x</b>	quad
<b>..x2x</b>	pair (double cores)	<b>..x5x</b>	five-core
<b>..x3x</b>	triple		

## Conductor diameter in mm

## Type of stranding components

<b>F</b>	star quad with phantom circuit in railway cables	<b>St V</b>	star quad for transmission of f=550 kHz
<b>S</b>	signal core in railway signal cable	<b>St VI</b>	star quad for transmission of f=17 Mhz
<b>StO</b>	star quad general	<b>DM</b>	Dieselhorst-Martin quad
<b>St</b>	star quad with phantom circuit for long distance	<b>TF</b>	carrier frequency star quad
<b>St I</b>	star quad without phantom circuit	<b>P</b>	twisted pair
<b>St II</b>	star quad like St III, but with increased capacitance unbalances	<b>PIMF</b>	pair in metal foil
<b>St III</b>	star quad in local (Subscriber) cable	<b>VIMF</b>	quad in metal foil
<b>St IV</b>	star quad for transmission of f=120 kHz	<b>BdiMF</b>	unit in metal foil
		<b>Kx</b>	coaxial cable

## Stranding Layout

<b>Lg</b>	layer stranding concentric
<b>Bd</b>	unit stranding

## Armouring wire

<b>A</b>	layer of Al-wires for inductive protection	<b>2B 0.5</b>	2 layers steel tape, thickness 0.5 mm
<b>b</b>	armouring	<b>D</b>	layer of copper wires for inductive protection
<b>B</b>	armouring of steel band for inductive protection	<b>(T)</b>	strain bearing of steel wires for aerial cable
<b>1B 0.3</b>	1 layer steel tape, thickness 0.3 mm		



# Designation code for harmonized cables according to DIN VDE 0281/DIN VDE 0282/DIN VDE 0292

## Construction reference



## Identifications of designation

- A authorised national standards
- H harmonized standards

## Nominal voltage U

- |    |           |    |           |
|----|-----------|----|-----------|
| 01 | 100 V     | 05 | 300/500 V |
| 03 | 300/300 V | 07 | 450/750 V |

## Insulating materials

- B (EPR) Ethylene-propylene-rubber
- G (EVA) Ethylene-Vinylacetat-Copolymer
- N2 (CR) Chloroprene rubber for welding cables
- R (NR a./o. SR) Natural a./o. synthetic rubber
- S (SiR) Silicone rubber
- V (PVC) Polyvinyl chloride
- V2 (PVC) Polyvinyl chloride heat-resistant
- V3 (PVC) Polyvinyl chloride low-temperature
- V4 (PVC) Polyvinyl chloride cross-linked
- Z (PE) Polyethylene cross-linked

## Structural elements

- C Screen
- Q4 (PA) additional polyimide core jacket
- T additional textile braiding over laid-up cores
- T6 additional textile braiding over individual cores

## Sheath/jacket material

- |   |  |
|---|--|
| B (EPR) Ethylene-propylene rubber               | T Textile braid                                |
| J Glass fibre braid                             | T2 Textile braid with flame retardant compound |
| N (CR) Chloroprene rubber                       | V (PVC) Polyvinyl chloride                     |
| N2 (CR) Chloroprene rubber for welding cables   | V2 (PVC) Polyvinyl chloride heat-resistant     |
| N4 (CR) Chloroprene rubber heat-resistant       | V3 (PVC) Polyvinyl chloride low-temperature    |
| Q (PUR) Polyurethane                            | V4 (PVC) Polyvinyl chloride cross-linked       |
| R (NR a./o. SR) Natural- a./o. synthetic rubber | V5 (PVC) Polyvinyl chloride oil resistant      |

## Special structural features

- |  |  |
|--|--|
| D3 Stress-relieving elements (support wire)            | H2 Flat, non-separable cable (two-core sheathed cable)           |
| D5 Centre core (no supporting element)                 | H6 Flat, non-separable cable (multi-and multiple sheathed cable) |
| FM Telecommunications cores integrated in power cables | H7 Two-layer insulating jacket                                   |
| H Flat, separable cable (twin cable)                   | H8 Spiral cables   |

## Conductor type

- |  |  |
|--|--|
| D Finely stranded, for welding cables                | K Finely stranded, for cables for fixed installation |
| E (very) finely stranded, for welding cables         | R Multiple-wire, round, class 2                      |
| F Finely stranded, for cables for fixed installation | U Single-wire, round, class 1                        |
| H (very) finely stranded, for flexibe cables         | Y Tinsel wire, DIN 47104                             |

## Number of cores

## Earth core

- G With earth core
- X Without earth core

## Conductor nominal cross section in mm<sup>2</sup>

Examples :

H07V-U 2.5 black ( according to DIN VDE 0281 )

Harmonized PVC-insulated single-core sheathed cable, 2.5 mm<sup>2</sup>, single-core, nominal voltage 750 V

H07RN-F 3G 1.5 ( according to DIN VDE 0282 )

Harmonized rubber-sheathed-cable for medium tensile loads, three-core 1.5 mm<sup>2</sup>, finely stranded, green-yellow earth core, nominal voltage 750 V





## Comparison of harmonized cables with IEC, DIN VDE and HD

Table 19

☑ PVC-insulated cables according to DIN VDE 0281 in comparison with IEC and HD							
Designation	accord to VDE part...	short designation new	short designation old VDE 0250	nominal cross-section (mm <sup>2</sup> )	nominal voltage U <sub>0</sub> /U (V)	according to HD	comparative design to IEC
PVC-wiring cables single wire fine wires	0281 part 3	H 05V-U	NYFA, NYA	0.5 to 1.0	300/500	HD 21.3 S3	227 IEC 05
	0281 part 3	H 05V-K	NYFAF,				227 IEC 06
PVC-insulated cables single wire multi-stranded wires fine wires	0281 part 3	H 07V-U	NYA	1.5 to 10	450/750	HD 21.3 S3	227 IEC 01
	0281 part 3	H 07V-R	NYA	1.5 to 400			227 IEC 01
	0281 part 3	H 07V-K	NYAF	1.5 to 240			227 IEC 02
Light PVC-Twin cables	0281 part 5	H 03VH-Y	NLYZ	0.1	300/300	HD 21.5 S3	227 IEC 41
Twin cables	0281 part 5	H 03VH-H	NYZ	0.5+0.75	300/300	HD 21.5 S3	227 IEC 42
PVC-sheathed cables 03VV-f round flat	0281 part 5	H 03VV-F	NYLHY round	0.5+0.75	300/300	HD 21.5 S3	227 IEC 43
	0281 part 5	H 03VVH2-F	NYLHY flat	0.5+0.75			227 IEC 43
PVC-sheathed cables 05 VV-F round flat	0281 part 5	H 05VV-F	NYMHY round	0.75 to 2.5	300/500	HD 21.5 S3	227 IEC 53
			NYMHY round	1 to 2.5			227 IEC 53
	0281 part 5	H 05VVH2-F	NYMHY flat	0.75	300/500	227 IEC 53	
PVC-Flat-cable 05VV-H6 PVC-Flat-cable 07VV-H6	0281 part 403	H 05VVH6-F	NYFLY	0.75 to 1	300/500	-	-
	0281 part 404	H 07VVH6-F	NYFLY	1.5 to 2.5	450/750	-	-

Table 20

☑ Rubber insulated power cables according to DIN VDE 0282 in comparison with IEC and HD							
Designation	according to VDE	short designation new	short designation old VDE 0250	nominal cross-section (mm <sup>2</sup> )	nominal voltage U <sub>0</sub> /U (V)	according to HD	comparative design to IEC
Heat-resistant rubber-insulated cable H 07G	0282 part 7	H 07G-U	N4GA	1.5+2.5	450/750	HD 22.7 S2	-
	0282 part 7	H 07G-K	N4GAF	0.5 to 95			-
Heat-resistant silicone-rubber cable	0282 part 601	H 05SJ-K	N2GAFU	0.5 to 95	300/500	HD 22.3 S2	245 IEC 03
Braided flexible cord	0282 part 4	H 03RT-F	NSA	0.75 to 1.5	300/500	HD 22.4 S3	245 IEC 51
Rubber sheathed flexible cord 05RR	0282 part 4	H 05RR-F	NLH, NMH	0.75 to 2.5	300/500	HD 22.4 S3	245 IEC 53
Polychloroprene sheathed flexible cable 05RN	0282 part 4	H 05RN-F	NYMHoü	0.75+1	300/500	HD 22.4 S3	245 IEC 57
			NYMHoü	0.75+1			245 IEC 57
			NYMHoü	0.75			245 IEC 57
Polychloroprene sheathed flexible cable 07RN	0282 part 4	H 07RN-F	NMHöü	1.5 to 500	450/750	HD 22.4 S3	245 IEC 65
			NSHoü	1 to 25			245 IEC 66
				1 to 300			
				1.5+2.5			
Rubber insulated lift cable with textile braid 05RT2D5 Rubber insulated lift cable with polychloroprene sheath 05RND5	0282 part 807	H05RT2D5-F	NFLG	0.75	300/500	-	-
	0282 part 807	H05RND5-F	NFLGC	0.75	300/500	-	-
Rubber insulated lift cable with textile braid 07RT2D5 Rubber insulated lift cable with polychloroprene sheath 07RND5	0282 part 808	H07RT2D5-F	NFLG	1	450/750	-	-
	0282 part 808	H07RND5-F	NFLGC	1	450/750	-	-

IEC-definition

IEC 227 : Polyvinylchloride insulated flexible cables and cords with circular conductors and a rated voltage not exceeding 750 V

IEC 245 : Rubber insulated flexible cables and cords with circular conductors and a rated voltage not exceeding 750 V



## US-American and British units conversion of usual measuring units

### Units for cables and wires

In the US the measurements are mainly used in AWG-numbers ( AWG = American Wire Gauge ).  
The AWG numbers conform the british B&S-numbers (B&S= Brown & Sharp ).

AWG No.	Cross section mm <sup>2</sup>	Dia meter mm	Conductor resistance ohm/km	AWG No.	Cross section mm <sup>2</sup>	Dia meter mm	Conductor resistance ohm/km
1000 MCM*	507	25.4	0.035	14	2.08	1.63	8.79
750	380	22.0	0.047	15	1.65	1.45	11.20
600	304	19.7	0.059	16	1.31	1.29	14.70
500	254	20.7	0.07	17	1.04	1.15	17.80
400	203	18.9	0.09	18	0.8230	1.0240	23.0
350	178	17.3	0.10	19	0.6530	0.9120	28.3
300	152	16.0	0.12	20	0.5190	0.8120	34.5
250	127	14.6	0.14	21	0.4120	0.7230	44.0
4/0	107.20	11.68	0.18	22	0.3250	0.6440	54.8
3/0	85.00	10.40	0.23	23	0.2590	0.5730	70.1
2/0	67.50	9.27	0.29	24	0.2050	0.5110	89.2
0	53.40	8.25	0.37	25	0.1630	0.4550	111.0
1	42.40	7.35	0.47	26	0.1280	0.4050	146.0
2	33.60	6.54	0.57	27	0.1020	0.3610	176.0
3	26.70	5.83	0.71	28	0.0804	0.3210	232.0
4	21.20	5.19	0.91	29	0.0646	0.2860	282.0
5	16.80	4.62	1.12	30	0.0503	0.2550	350.0
6	13.30	4.11	1.44	31	0.0400	0.2270	446.0
7	10.60	3.67	1.78	32	0.0320	0.2020	578.0
8	8.366	3.26	2.36	33	0.0252	0.1800	710.0
9	6.63	2.91	2.77	34	0.0200	0.1600	899.0
10	5.26	2.59	3.64	35	0.0161	0.1430	1125.0
11	4.15	2.30	4.44	36	0.0123	0.1270	1426.0
12	3.30	2.05	5.41	37	0.0100	0.1130	1800.0
13	2.62	1.83	7.02	38	0.00795	0.1010	2255.0
				39	0.00632	0.0897	2860.0

4/0 is also stated: 0000; 1 mil = 0.001 inch = 0.0254 mm  
\*for bigger cross-section the sizes in MCM (circular mils)

1 CM = 1 Circ. mil. = 0.0005067 mm<sup>2</sup>  
1 MCM = 1000 Circ. mils = 0.5067 mm<sup>2</sup>

### General measuring units

<b>Length</b>	1 lb (pound) = 0.4536 kg	1 in H <sub>2</sub> O = 2.491 mbar
1 mil = 0.0254 mm	1 stone = 6.35 kg	1 N/mm <sup>2</sup> = 145 psi
1 in (inch) = 25.4 mm	1 qu (quarter) = 12.7 kg	= 10 bar
1 ft (foot) = 0.3048 m	1 US-cwt (hundred weight) = 45.36 kg	1 kp/mm <sup>2</sup> = 1422 psi
1 yd (yard) = 0.9144 m	1 US ton (short ton) = 0.907t	1 at = 736 Torr
1 ch (chain) = 20.1 m	1 brit ton (long ton) = 1.016t	= 1 kp/cm <sup>2</sup>
1 mile (land mile) = 1.609 km		1 Torr = 1 mm Hg
= 1760 yards	<b>Force</b>	1 bar = 0.1 H Pa
1 mile (nautic mile) = 1.852 km	1 lb = 4.448 N	1 pa = 1 N/m <sup>2</sup>
1 mm = 0.039370 inches	1 brit ton = 9954 N	<b>Density</b>
1 m = 39.370079 inches	1 pdl (poundal) = 0.1383 N	1 lb/cu.ft = 16.02 kg/m <sup>3</sup>
<b>Area</b>	1 kgf = 9.81 N	1 lb/cu.in. = 27.68 t/m <sup>3</sup>
1 CM (circ.mil) = 0.507 · 10 <sup>-3</sup> mm <sup>2</sup>	1 N = 1.02 kgf	<b>Horse power</b>
1 MCM = 0.5067 mm <sup>2</sup>	<b>Velocity</b>	1 hp·h = 1.0139 PS·h
1 sq.inch (sq.inch) = 645.16 mm <sup>2</sup>	1 mile/h = 1.609 km/h	= 2.684 · 10 <sup>6</sup> Joule
1 sq.ft (sq.foot) = 0.0929 m <sup>2</sup>	1 Knoteh = 1.852 km/h	= 746 W·h
1 square yard = 0.836 m <sup>2</sup>	1 ft/s = 0.305 m/s	1BTU(brit therm. unit) = 1055 Joule
1 acre = 4047 m <sup>2</sup>	1 ft/min = 0.508 · 10 <sup>-3</sup> m/s	<b>Electrical units</b>
1 square mile = 2.59 km <sup>2</sup>	<b>Radiation absorbed dose</b>	1 ohm/1000 yd = 1.0936 Ω/km
<b>Density</b>	1 Gray = 1 J/kg	1 ohm/1000 ft = 3.28 Ω/km
1 cu.in. (cubic inch) = 16.39 cm <sup>3</sup>	1 rad = 10 <sup>-2</sup> J/kg = 1 CentiGy	1 μF/mile = 0.62 μF/km
1 cu.ft. (cubic foot) = 0.0283 m <sup>3</sup>	= 0.01 Gy	1 megohm/mile = 1.61 MΩ/km
1 cu.yd. (cubic yard) = 0.7646 m <sup>3</sup>	1 Centi = 100 Joule	1 μμf/foot = 3.28 pF/m
1 gal. (us gallon) = 3.785	1 rad = cJ/kg = 0.01 Gy	1 decibel/mile = 71.5 mN/m
1 gal. (brit gallon) = 4.546	1 Mrad = 1 · 10 <sup>6</sup> cJ/kg	<b>Power rate</b>
1 US pint = 0.473	<b>Energy</b>	1 PS = 0.736 kW
1 US quart = 0.946	1 kcal = 1/16 · 10 <sup>3</sup> kWh	1 kW = 1.36 PS
1 US barrel = 158.81	1 kWh = 360 kcal	1 hp = 0.7457 kW
<b>Temperature</b>	<b>pressure</b>	1 kW = 1.31 hp
F (Fahrenheit) = (1/8 · C) + 32°	1 psi (lb/sq.) = 68.95 mbar	
C (Celsius) = 0.5556 · (F-32°)	= 6.895 · 10 <sup>-3</sup> Nmm <sup>2</sup>	
<b>Weight</b>	1 lb/sq.ft = 0.478 mbar	
1 grain = 64.8 mg	1 pdl/sq.ft = 1.489 N/m <sup>2</sup>	
1 dram = 1.77 g	1 in Hg = 33.86 mbar	
1 oz (ounce) = 28.35 g	1 ft H <sub>2</sub> O = 29.89 mbar	



## Cross-section for single wire round

$$q = \frac{D^2 \cdot \pi}{4} \text{ or } D^2 \cdot 0.7854$$

## Cross-section for bunched wire

$$q = \frac{D^2 \cdot \pi}{4} \cdot n \text{ or } d^2 \cdot 0.7854 \cdot n$$

## Diameter for single wires cross-section

$$D = \sqrt{\frac{q \cdot 4}{\pi}} \text{ or } \sqrt{q \cdot 1.2732}$$

## Diameter for bunched wires

$$D = \sqrt{1.34 \cdot n \cdot d}$$

q = cross-section (mm<sup>2</sup>)

D = conductor diameter (mm)

d = single wire diameter (mm)

n = number of wires

## Conductor Resistance

$$R = \frac{L}{\kappa \cdot q} \text{ or } \frac{\rho \cdot L}{q}$$

$$R_{loop} = \frac{2 \cdot L}{\kappa \cdot q} \text{ or } \frac{2 \cdot L \cdot \rho}{q}$$

R = Electrical direct-current resistant (ohm)

R<sub>loop</sub> = Resistance of a complete circuit

q = cross-section (mm<sup>2</sup> or q mm)

κ (kappa) = conductivity

ρ (Rho) = Specific resistance  $\rho = \frac{1}{\kappa}$

L = Conductor Length

Materials	Conductivity $\frac{m}{\Omega \cdot mm^2}$	Spec. resistance $\frac{\Omega \cdot mm^2}{m}$
Copper	58.00	0.01724
Aluminium	33.00	0.0303
Silver	62.00	0.1613
Iron	7.70	0.1299
Constantan	2.00	0.50

## Serial connection

Resistance  $R = R_1 + R_2 + R_3 + \dots + R_n$

Capacitance  $\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} + \dots + \frac{1}{C_n}$

Inductance  $L = L_1 + L_2 + L_3 + \dots + L_n$

## Parallel connection

Resistance  $R = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}}$

Capacitance  $C = C_1 + C_2 + C_3 + \dots + C_n$

Inductance  $L = \frac{1}{\frac{1}{L_1} + \frac{1}{L_2} + \frac{1}{L_3} + \dots + \frac{1}{L_n}}$

## Mutual capacity (c)

- coaxial cable  $C = \frac{\xi r \cdot 10^3}{18 \cdot \ln \frac{D_a}{d}}$  (nF/km)

- parallel core  $C = \frac{\xi r \cdot 10^3}{36 \cdot \ln \frac{D_a}{d}}$  (nF/km)

- shielded twisted pair

$$C_B = \frac{\xi r \cdot 10^3}{36 \ln \frac{2a}{d} \cdot \frac{(D_a^2 - a^2)}{(D_a^2 + a^2)}} \text{ (nF / km)}$$

D<sub>a</sub> = outer diameter over insulation

D<sub>s</sub> = diameter over shield

d = diameter of conductor

a = distance-mid to mid of both conductors

ξr = dielectric constant

## ohm's Law

The current intensity (I) is proportional to voltage (U) and inversely proportional to resistance (R)

$$I = \frac{U}{R} \quad R = \frac{U}{I} \quad U = I \cdot R$$

I = current intensity (Amps - A)

R = electrical resistance (Ω)

U = electrical voltage (V)

## Conductance

$$G = \frac{1}{R} \quad 1S = \frac{1}{1\Omega} \quad \text{or} \quad 1\mu S = \frac{1}{1M\Omega}$$

S (Siemens)=reciprocal value of a resistance is used as **conductance**

1 Siemens= 1 / Ohm

G = electrical conductance

## Capacitance

- Single core against earth

$$C_B = \frac{\xi r \cdot 10^3}{18 \ln \frac{D_i}{d_i}} \text{ (nF/km or pF/m)}$$

- Unshielded symmetrical twisted pair

$$C_B = \frac{\xi r \cdot 10^3}{36 \ln \frac{2a}{d}} \text{ (nF/km or pF/m)}$$

- Coaxial pair

$$C_B = \frac{\xi r \cdot 10^3}{18 \ln \frac{D_i}{d}} \text{ (nF/km or pF/m)}$$

- Shielded symmetrical twistet pair

$$C_B = \frac{\xi r \cdot 10^3}{36 \ln \frac{2a}{d} \cdot \frac{(D_a^2 - a^2)}{(D_a^2 + a^2)}} \text{ (nF/km or pF/m)}$$

D<sub>i</sub> = outer diameter over single core (mm)

D<sub>a</sub> = outer diameter of multicores (mm)

d = conductor diameter (mm)

a = distance between two conductors mid to mid of both conductors

## Inductance of parallel cores

at low frequencies

$$L = 0.4 \left( \ln \frac{D_a}{r} + 0.25 \right) \text{ mH/km}$$

at high frequencies

$$L = 0.4 \left( \ln \frac{D_a}{r} + 0 \right) \text{ mH/km}$$

## Inductance of coaxial cable

at high frequencies

$$L = 0.2 \left( \ln \frac{D_a}{r} + 0 \right) \text{ mH/km}$$

D<sub>a</sub> = distance between two conductors mid to mid of both conductors

r = radius of a conductor

ξr = dielectric constant

## Impedance (Z)

for coaxial cable  $Z = \frac{60}{\sqrt{\xi r}} \cdot \ln \frac{D}{d} \text{ (}\Omega\text{)}$

D = diameter over insulation

d = conductor diameter

for communication cable

at low frequencies  $Z = \sqrt{\frac{R}{C}} \text{ (}\Omega\text{)} \cdot \tan \varphi = 1, \varphi = 45^\circ$

at high frequencies  $Z = \sqrt{\frac{L}{C}} \text{ (}\Omega\text{)}$

R = Resistance (Ω/km)

L = Inductance (mH/km)

C = Capacitance (nF/km)

ω = 2πf

## Wave length $\lambda = \frac{v}{f}$

λ = wave length

v = propagation velocity (velocity

of light: 300,000 km/s)

f = frequency

units of attenuation - neper (N), decibel (dB) and Bel (B)

$$1 \text{ Np} = 8,686 \text{ dB}$$

$$1 \text{ dB} = 0,1151 \text{ Np} = \frac{1}{10} \text{ Bel}$$

$$1 \text{ Bel} = 10 \text{ dB} = 1,1513 \text{ Np}$$



# Formulas of power engineering

## Cross-section

- for direct current and single phase alternative current of known **current**

$$q = \frac{2 \cdot I \cdot L}{\kappa \cdot U} \text{ (mm}^2\text{)}$$

for three-phase current

$$q = \frac{1,732 \cdot I \cdot \cos \varphi \cdot L}{\kappa \cdot U} \text{ (mm}^2\text{)}$$

- for direct current and single phase alternative current of known **power**

$$q = \frac{2 \cdot I \cdot P}{\kappa \cdot U \cdot U} \text{ (mm}^2\text{)}$$

for three-phase current

$$q = \frac{I \cdot P}{\kappa \cdot U \cdot U} \text{ (mm}^2\text{)}$$

## Voltage drop

For low voltage cable network of normal operation, it is advisable of a voltage drop of 3-5%.

On exceptional case, higher values (up to 7%) can be permitted in case of network-extension or in short-circuit.

- for direct current of known **current**

$$u = \frac{2 \cdot I \cdot L}{\kappa \cdot q} \text{ (V)}$$

for single phase alternative current

$$u = \frac{2 \cdot I \cdot \cos \varphi \cdot L}{\kappa \cdot q} \text{ (V)}$$

for three-phase current

$$u = \frac{1,732 \cdot I \cdot \cos \varphi \cdot L}{\kappa \cdot q} \text{ (V)}$$

- for direct current of known **power**

$$u = \frac{2 \cdot I \cdot P}{\kappa \cdot q \cdot U} \text{ (V)}$$

for single phase alternative current

$$u = \frac{2 \cdot I \cdot P}{\kappa \cdot q \cdot U} \text{ (V)}$$

for three-phase current

$$u = \frac{I \cdot P}{\kappa \cdot q \cdot U} \text{ (V)}$$

u = voltage drop (V)

U = operating voltage (V)

P = power (W)

Rw = effective resistance (Ω/km)

L = Inductance (mH/km)

ωL = Inductive resistance (Ω/km) (ω=2·π·f at 50 Hz=314)

q = cross-section (mm<sup>2</sup>)

I = working current (A)

L = length of the line (m)

κ (kappa) = electrical conductivity of conductors

κ-Copper = 56

κ-Alu = 33

## Nominal voltage

The nominal voltage is to be expressed with two values of alternative current U<sub>0</sub>/U in V (Volt).

U<sub>0</sub> / U = phase-to-earth voltage

U<sub>0</sub> : Voltage between conductor and earth or metallic covering (shields, armouring, concentric conductor)

U : Voltage between two outer conductors

U<sub>0</sub> : U/√3 for three-phase current systems

U<sub>0</sub> : U/2 for single-phase and direct current systems

U<sub>0</sub>/U<sub>0</sub> : an outer conductor is earth-connected for A.C.- and D.C.- systems

## Nominal current

I in (A)

## Active current

$$I_w = I \cdot \cos \varphi$$

## Reactive current

$$I_0 = I \cdot \sin \varphi$$

## Apparent power (VA)

S = U·I for single phase current (A.C.)

S = 1,732·U·I for three- phase current

## Active power (W)

P = U·I·cos φ for single phase current (A.C.)

P = 1,732·U·I·cos φ for three- phase current

P = U·I for direct current

## Reactive power (Var)

Q = U·I·sin φ for single phase current (A.C.)

Q = 1,732·U·I·sin φ for three- phase current

(Voltampere reactive) Q=P·tan φ

## Phase angle

φ is a phase angle between voltage and current

$$\frac{\cos \varphi = 1,0 \quad 0,9 \quad 0,8 \quad 0,7 \quad 0,6 \quad 0,5}{\sin \varphi = 0 \quad 0,44 \quad 0,6 \quad 0,71 \quad 0,8 \quad 0,87}$$

## Insulation resistance

$$R_{iso} = \frac{S_{iso}}{l} \cdot \ln \frac{D_a}{d} \cdot 10^{-8} \text{ (M}\Omega \cdot \text{km)}$$

## Specific insulation resistance

$$R_s = \frac{R \cdot \pi \cdot l \cdot 10^8}{\ln \frac{D_a}{d}}$$

Da = outer diameter over insulation (mm)

d = conductor diameter (mm)

di = inner diameter of insulation (mm)

l = length of the line (m)

Siso = Spec. resistance of insulation materials (Ω · cm)

## Mutual capacity (C<sub>B</sub>) for single-core, three-core and H-cable

$$C_B = \frac{\xi_r \cdot 10^9}{18 \ln \frac{D_a}{r}} \text{ (nF/km)}$$

## Inductance

Single-phase 0,4 · (ln  $\frac{D_a}{r}$  + 0,25) mH/km

three-phase 0,2 · (ln  $\frac{D_a}{r}$  + 0,25) mH/km

Da = distance-mid to mid of both conductors

r = radius of conductor (mm)

ξr = dielectric constant

0,25 = factor for low frequency

## Earth capacitance

$$E_c = 0,6 \cdot C_B$$

## Charging current (only for three-phase current)

$$I_{Lad} = U \cdot 2\pi f \cdot C_B \cdot 10^{-6} \text{ A/km per core at 50 Hz}$$

## Charging power

$$P_{Lad} = I_{Lad} \cdot U$$

## Leakage and loss factor

$$G = \tan \delta \cdot \omega C \text{ (S)}$$

$$\tan \delta = \frac{G}{\omega C}$$

$$\omega = 2\pi f$$

C=Capacity

tanδ=loss factor

$$S = \text{Siemens} = \frac{1}{\Omega}$$

## Dielectric loss

$$D_v = U^2 \cdot 2\pi f \cdot C_B \cdot \tan \delta \cdot 10^{-6} \text{ (W/km)}$$

f bei 50 Hz

tanδ PE/VPE (XLPE) ~0,0005

EPR ~0,005

Paper-single core, three-core, H-cable ~0,003

Oil-filled and pressure cable ~0,003

PVC cable ~0,05

It should be noted that for the current load of the insulated cables and wires of selected cross-section, the power ratings table is also be considered.

To estimate the voltage drop of insulated wires and cables for heavy (big) cross-sections of single- and three-phase-overhead line, the active resistance as well as the inductive resistance must be considered.

The formula for single-phase (A.C.) :

$$U = 2 \cdot I \cdot I \cdot (R_w \cdot \cos \varphi + \omega L \cdot \sin \varphi) \cdot 10^{-3} \text{ (V)}$$

Three-phase :

$$U = 1,732 \cdot I \cdot I \cdot (R_w \cdot \cos \varphi + \omega L \cdot \sin \varphi) \cdot 10^{-3} \text{ (V)}$$

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