1.2. Comparison of Characteristics of Copper and Aluminum

Material	Copper	Aluminum	Aluminum alloy	Galvanized steel
Specific gravity g/cm3	8.89	2.703	2.70	7.8
Tensile strength MPA a) Hard drawn	367	160	-	1320-1700
b (annealed	248	100	295	
Volume resistivity at 20°C .m	1.724 x Id ‘	2.826 x 10-x	3.253 x 10’*	-
Temperature coefficient of resistance per °C	0.00393	0.00403	0.00360	0.0054
Coefficient of linear expansion per °C	17 x 10 ‘6	23 x 10 ‘6	23 x 10 ■6	1 1.5
Specific heat KJ/kg/K	0.394	0.904	0.904	-
Melting point °C’	1083	658	658	-
conductivity	97	61	53	9

1.3. Insulating Materials Types Per IEC 60502-1

• PVC/A: PVC primary insulating material for low voltage electrical cable; working temperature 70 °C

• PVC/B: PVC primary insulating material for low voltage electrical cable: working temperature 80 °C

• PVC/C: PVC insulating material for low voltage electrical cable. Working temperature 90 °C.

• ST1: PVC sheathing material for medium and high voltage electrical cable; working temperature 80 °C.

• ST2: PVC sheathing material for medium and high voltage electrical cable; working temperature 90 °C.

• ST2: PVC sheathing material for medium and high voltage electrical cable; working temperature 90 °C.

• ST3: polyethylene outer jacket material for medium and high voltage electrical cable; working

tempera-ture 80 °C.

• ST7: Polyethylene outer jacket material for medium and high voltage electrical cable; working tempera-ture 90 °C.

• ST8: halogen free PVC insulation for special requirement cables; working temperature 90 °C

♦ XLPE: (cross linked polyethylene) inner insulating material for medium and high voltage electrical cable, Working temperature 90 °C.

* SE1; (EPR) Ethylene propylene rubber inner insulating material for medium and high voltage electrical cable, Working temperature 85 °C.

1.4. Comparison of Characteristics of Insulation Materials

1.4.1. Maximum insulating material operating temperature, Short circuit current and other physical properties

Insulating material	PVC	PVC	XLPE	EPR
1. Maximum conductor operating temperature °c	Cross sectional area<300mm2 70/80	Cross sectional area >3 00mm2 70/80	90	90
2. Short circuit current in maximum duration of 5 second.	160	140	250	250
3. Tensile strength minimum N/mm	12.5	12.5	12.5	4.2
4. Volume resistivity at max. conductor tempera¬ture nominal operating , p in ohm centime- ter(Q.cm)	10^{10}	10^{10}	10^{12}	10^{12}
5.Insulation resistance constant at maximum conductor temperature nominal opera¬tion. (Mflkm)	0.037	0.037	3.67	3.67
6.Elongation at break minimum,%	150	150	200	200

1.4.2.Product feature of PVC insulated cable.

• Non hygroscopic , un affected by moisture

• Non-migration of compound permitting vertical installation

• Complete resistance to electrolytic and chemical corrosion.

• Tough and resilient sheathing with excellent fire resistance

• Good aging characteristics' not affected by vibration.

1.4.3. Product feature of XLPE insulated cable

• Higher current and short current rating.

• Longer service life

• It is less sensitive to the setting of network protection.

• Low dielectric loss

• Excellent mechanical resistance against external stress.

• Excellent crack resistance due to cross linking of thermosetting effect.

• Resistance to acids bases than thermoplastic cables.

Note: for further technical information see annex attached.

1.5. Standards Related to Product

1.5.1 IEC Standards

• IEC 60228: Conductors of insulated cables

• IEC: 60060-1: High voltage test Techniques

• IEC 60227-2.: Polyvinyl chloride insulated cables of rated voltage up to and including450/750 V -

• IEC 60227-3: Polyvinyl chloride insulated cables of rated voltage up to and including450/750 V - Part 3: Non-sheathed cables for fixed wiring

• IEC 60227-4: Polyvinyl chloride insulated cables of rated voltage up to and including450/750 V: Part 4: Sheathed cables for fixed wiring

• IEC 60227-5: Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 5: Flexible cables (cords)

• IEC 60502-1: Power cables with extruded insulation and their accessories for rated voltages up to includ¬ing 0.6/1(1.2) k volt.

• IEC60502-2: Power cables with extruded insulation and their accessories for rated voltages up to includ¬ing 30/36K volt

• IEC 60173: Colors of the cores of flexible cables and cords

• IEC 60811: Common test methods for insulating and sheathing materials of electric cable.

• IEC 62440: Electric cables - Guide to use for cables with a rated voltage not exceeding 450/750V

• IEC 10104: Aluminum conductors

1.5.2 BS EN Standards

• BSEN 50363 Insulation type for wire and cable.

• BSEN 6004: British specific requirements for the construction, dimensions, mechanical and electrical Properties of non armored polyvinyl chloride (PVC) insulated for the operation at voltage up to

and in¬cluding 450/750 volt.

• BSEN 7655: specification for insulating material for wire and cables.

• BSEN 50182: Round concentric Conductors for overhead lines.

• BSEN 60811: Common test methods for insulating and sheathing materials of electric cable.

1.6 Insulating Wire & Cable Selecting Factors

There are important factors when selecting a suitable cable construction which is required to transport electrical energy from the power station to the consumer, from substation to main distributing line, from distributing line to users and within users machinery, equipment or anything that need power source.

• Maximum operating voltage

• Insulation type and level

• Frequency

• Rated voltage

• Magnitude and duration of possible load

• Voltage drop

• Line length

• Mode of installation, either underground ,in water or in air

• Chemical and physical properties of soil

• Max. and min. ambient air temperature and soil temperature

• Specification and requirements to be met

1.7. Color Scheme

The colors green and yellow, when not in combination, shall not be used for any multi core cable .The preferred color scheme for flexible cables and single-core cables is:

• single core cable: no need of color scheme

• two core cable: no need of color scheme

• Three core cable: Either green or yellow, Blue, brown or brown, black, grey

• Four core cable:Either green or yellow. Brown, black. Grey or blue, brown, black, grey.

• Five core cables:Either green or yellow, blue. Brown, black, grey or blue, brown, black, Grey, black.

1.8. Rated Voltage of Cable

It is denoted by Uo/U(Um) as per IEC 60502.

Where:

Uo: is the rated power frequency voltage between conductor and earth or metallic screen for Which

the cable is designed;

U: is the rated power frequency voltage between conductors for which the cable is designed;

Urn: is the maximum value of the “highest system voltage” for which the equipment may be used (see IEC 60038).

Rated voltage designation	Value											
Uo/U^kV	0.3/0.5	0.45/0.75	0.6/1	1.8/3.	3.6/6	6/10	8.7/15	12/20	18/30	38/66	76/132	172/220
Um	NA	NA	1.2	3.6	7.2	12	17.5	24	36	72.5	145	245

1.9. Product Code

: It is designated below as:

Conductor	Primary insula	Type of conductor	Inner sheath/tape	screening	Armor	Outer sheath /jacket	Rated voltage	No of core	Cross sectional
Cu	PVC or XLPE	S/R or F	PVC	Cu or A1	SWA or STA	PVC or HDPE	00	00	00
C	P or X	S/R or F	PI/PP	CT or AT	W or T	P.I or PE	00	00	00

For description of each see table (a-d) below:

d) Armor type, and screening conductor type

Armor type	*code*	*Screening type*	*code*
Galvanized steel wire armor(SWA)	*W*	*Copper tape screen*	*CT*
Galvanized steel tape armor (STA)	*T*	*Aluminum tape screen*	*AT*
Lead armor	*L*	*Galvanized steel tape(STA)*	*ST*
Lead alloy armor	*LI*		

1.10. Product Delivery Packing Type & Size

Product type	size	Packing type	delivery Remark size in meter
Single core solid insulated wire Two-five core solid cable	0.5-6 mm2 2xl.5-5x2.5mm2 3x6-5x6 mm2	coiled roll coiled roll wooden	100 100 1000
Single core Stranded or flexible cable	1.5-10 mm2	coiled roll	100
single core stranded or flexible cable	16-400 mm2 500-630 mm2	wooden wooden drum	1000 500
Two core stranded or flexible cable	2x1.5-2x6 mm2 2x6-2xl50mm2 2x180-2x400	coiled roll wooden drum wooden	100 1000 500
Three core stranded cable or flexible cable	3xl.5-3x4 mm2	coiled roll	100

	3x6-3x120	wooden	1000
	3xl50-3x240mm2	wooden drum	500
	3x300-3x400mm2	wooden drum	250
Four core stranded or flexible cable	4xl.5-4x2mm2	coiled roll	100
	4x4-4x95 mm2	wooden drum	1000
	4xl20-4x240mm2	wooden drum	500
	4x300-4x400mm2	wooden drum	100
Five core stranded or flexible cable	2xl.5-5x2.5 mm2	coiled roll	100
	5x4-5x70 mm2	wooden drum	1000
	5x70-5x185	wooden drum	500
	5x240-5x300	wooden drum	250

2. Product Types

The main inputs for products are conductor's semiconducting materials and insulators. Main Conductors used are copper or aluminum. Main insulating materials are PYC and XLPE.

2.1. Low Voltage Cables

Construction

• Conductor: Plain Annealed Copper

• Insulation : PVC type A compound per IEC60502-lor PVC typeTll per BSEN50363

• Operating temperature 70 °C

• Sheath ST1 ; operating temperature 70 °C per IEC 60227.

• Color : for insulation:

One core: Black Two cores: Red.

Black Three cores: Red Yellow, Blue

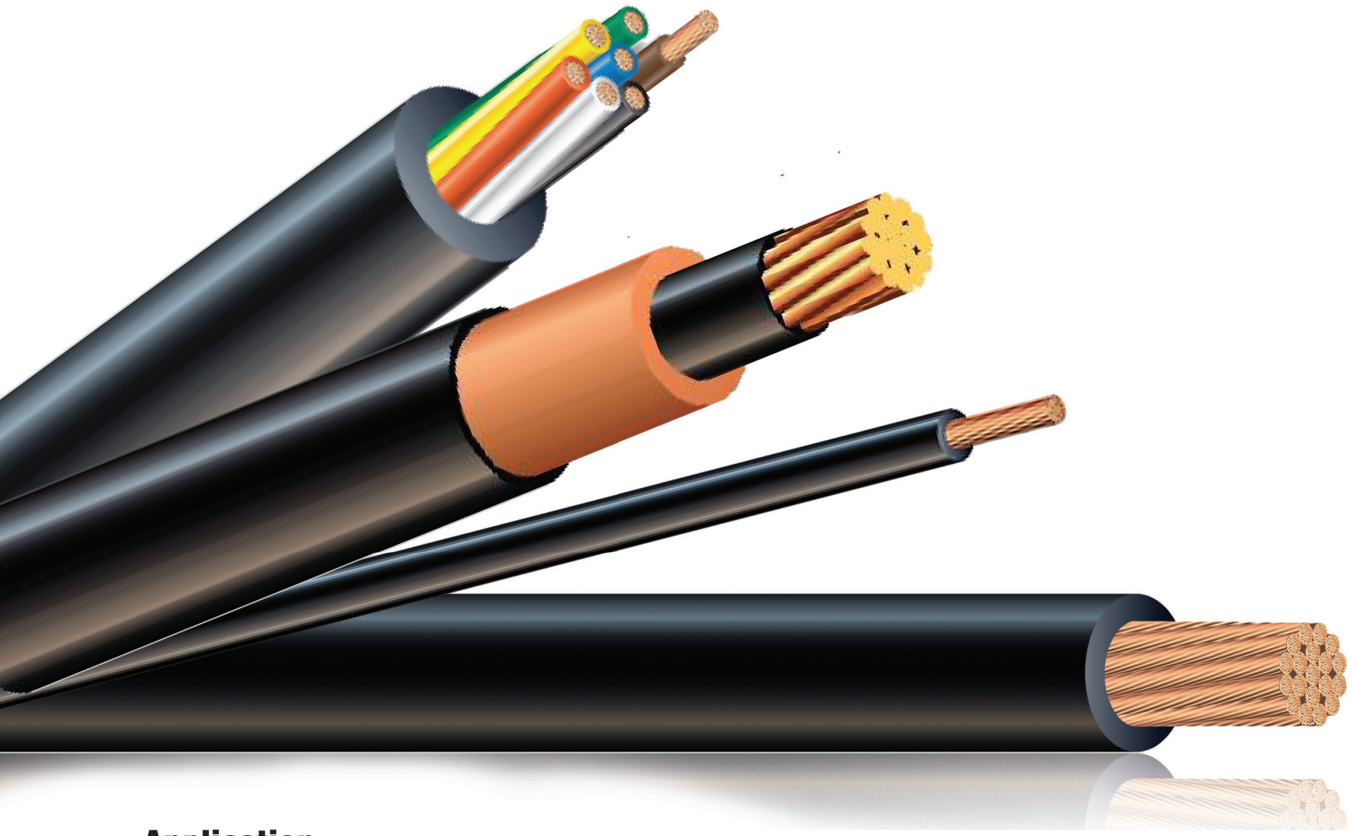
Four core: Red. Yellow, blue, black

Color for Sheath: grey for single core

Black for two or more core

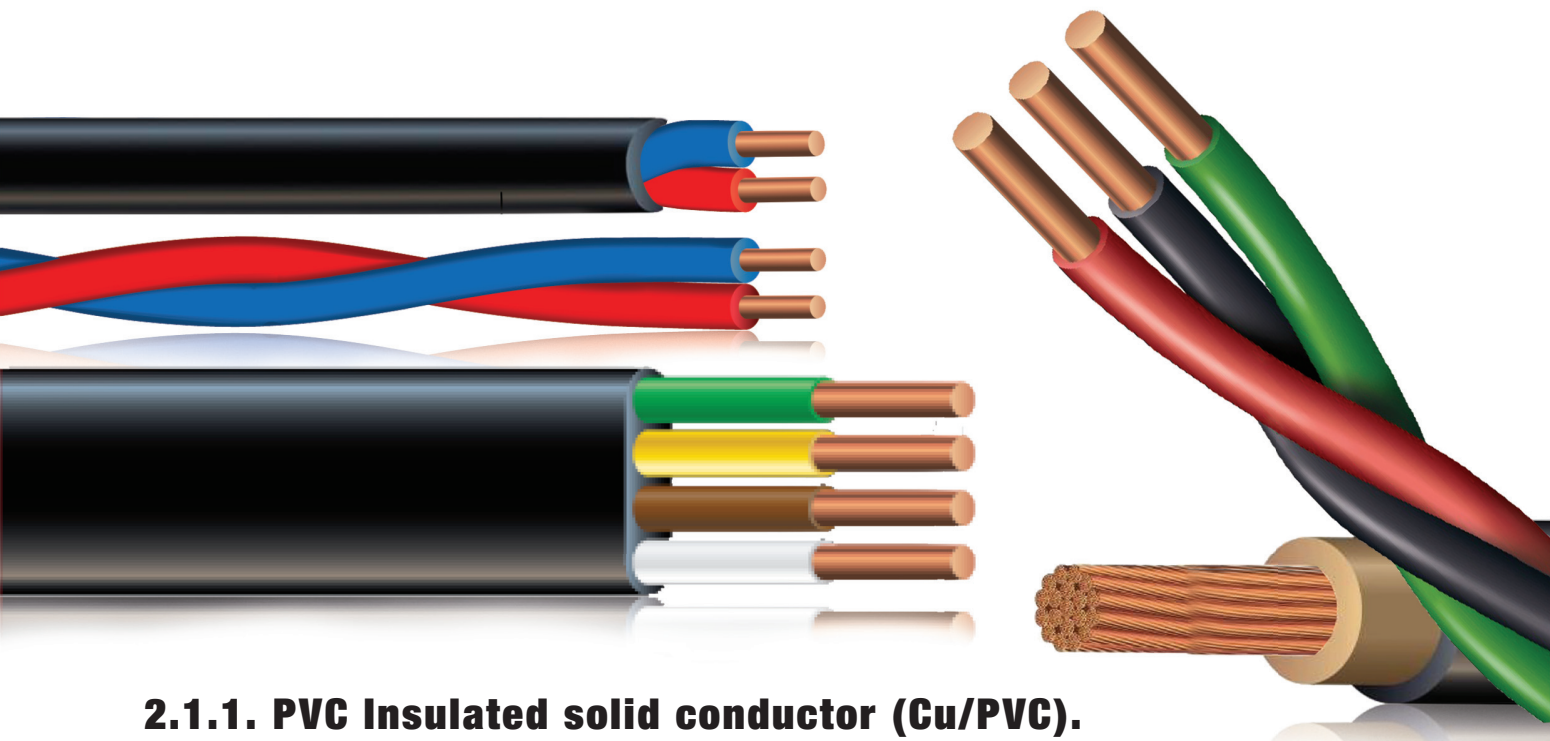
• Rated voltage: up to and including Uo/U : 450/750k V

• Conductor Stranding: Class Isolid circular conductors Per IEC 608228.IEC60227 :l-4



Application

• For installations in dry indoor places as fixed wiring laid in conduits or steel support brackets in the connection &distribution construction purposes.



2.1.1. PVC Insulated solid conductor (Cu/PVC).

Rated voltage, up to and including, U/UO 300/500 Application: for internal wiring

1. Solid copper conductor
2. PVC primay insulation

Product code	Cross Sectional Area in mm2	Diameter of Conductor in mm	Thickness of Insulation in mm	Approximate iverall diametert	Total weight in kg/lOOm	Max. Conductor DC Resistance at 20°ClnXl/km
CPS-0000-03-01-05	0.5	1.35	0.6	2.0	0.52	36.7
CPS-0000-03-01-07	0.75	1.75	0.6	2.2	0.74	24.8
CPS-0000-03-01-10	1.0	2.24	0.6	2.3	1.00	18.2

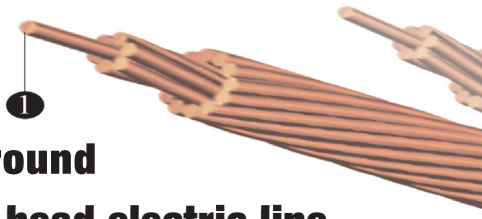
2.1.2. PVC Insulated solid conductor (CU/PVC) non bedding Rated

voltage up to and including, U/UO 450/750

Application: For fixed installations in dry or humid places as well as in the open air

Product code	Cross Sectional Area in mm2	Diameter of Conductor in mm	Thickness of Insulation in mm	Approximate over all diameter	Total weight in kg/100m	Max. Conductor DC Resistance at 20°Cin Q/km	Min Insulation Resistance at 70°Cin /2*km
Single core							
CPS-0000-03-01-11	1.5	1.35	0.7	2.8	1.42	12.10	0.0110
CPS-0000-03-01-13	2.5	1.75	0.8	3.4	2.41	7.41	0.0100
CPS-0000-03-01-16	4	2.24	0.8	3.8	4.00	4.61	0.0085
CPS-0000-03-01-20	6	2.75	0.8	4.4	6.07	3.08	0.0070
CPS-0000-03-01-21	10	3.57	1.0	5.6	10.24	1.83	0.0070
Two core							
CPS-000PJ-03-02-13	2.5		1.2	6.6	7.9	7.41	0.0110
CPS-000PJ-03-02-16	4		1.2	7.2	11.4	4.61	0.0100
CPS-000PJ-03-02-20	6		1.2	7.9	16.0	3.08	0.0085
CPS-000PJ-03-02-21	10		1.4	9.8	26.2	1.83	0.0070
Three core							
CPS-000PJ-03-03-13	2.5		1.2	7.5	10.8	7.41	0.0110
CPS-000PJ-03-03-16	4		1.2	8.3	16.1	4.61	0.0100
CPS-000PJ-03-03-20	6		1.2	9.0	22.8	3.08	0.0085
CPS-000PJ-03-03-21	10		1.4	11.3	37.6	1.83	0.0070
Four core							
CPS-000PJ-03-04-13	2.5		1.2	14	20.5	7.41	0.0110
CPS-000PJ-03-04-16	4		11	16.0	24	4.61	0.0100
CPS-000PJ-03-04-20	6		1.2	17.8	30.5	3.08	0.0085

2.2 Class 2 Bare Copper Wires.



1. Bare copper (Cu) as per IEC60502.

Assembly: A number of wires stranded to form round conductor Application: For grounding (earth) Over head electric line

Product code	Nominal Cross Sectional Area in mm2	Number ol Strands	Nominal Diameter Diameter of Stranded)f Copper ir Copper in mm mm		Approximate Weight in kg/lOOm	Max. Conductor DC Resistance at 20°C in/2/km
C0R-0000-04-01-11	1.5	7	0.53	1.7	1.3	12.100
C0R-0000-04-01-13	2.5	7	0.67	2.2	2.1	7.410
C0R-0000-04-01-16	4	7	0.85	2.6	3.4	4.610
C0R-0000-04-01-20	6	7	1.04	3.4	5.2	3.080
C0R-0000-04-01-21	10	7	1.35	4.3	8.7	1.830
C0R-0000-04-01-22	16	7	1.70	5.4	13.8	1.150
C0R-0000-04-01-23	25	7	2.14	6.4	21.9	0.727
C0R-0000-04-01-24	35	7	2.52	7.6	30.3	0.524
C0R-0000-04-01-25	50	19	1.78	9.0	43.4	0.387
C0R-0000-04-01-26	70	19	2.14	10.5	61.0	0.268
C0R-0000-04-01-27	95	19	2.52	11.8	82.3	0.193
C0R-0000-04-01-28	120	37	2.03	13.1	104.0	0.153
C0R-0000-04-01-29	150	37	2.25	14.7	127.8	0.124
C0R-0000-04-01-30	185	37	2.52	16.8	160.3	0.0991
C0R-0000-04-01-31	240	61	2.25	18.8	210.6	0.0754
C0R-0000-04-01-32	300	61	2.52	21.3	264.2	0.0601
C0R-0000-04-01-33	400	61	2.85	24.1	337.9	0.047
CP0-0000-04-01-34	500	61	3.20	27.3	434.0	0.0366
C0R-0000-04-01-35	630	127	2.52	29.6	555.0	0.0283

2.2.1 PVC Insulated Class-2 Stranded Conductors.

Construction

- Conductor: Plain Annealed Copper
- Conductor Stranding: Class 2 stranded circular or compacted conductors per IEC60228&.60502-1
- Assembly :A number wires twisted to form round conductor
- Insulation : PVC/C per IEC 60227-3 or PVC typeTl 1 per

BSEN50363 Technical data

- Rated voltage: Uo/U : 0.6/l.(1.2)kV
- Power frequency test voltage 3.5 kV for 5 minutes
- Maximum admissible temperature of conductor at normal operation 70 °C
- Maximum admissible temperature of conductor at short circuit for 5 seconds

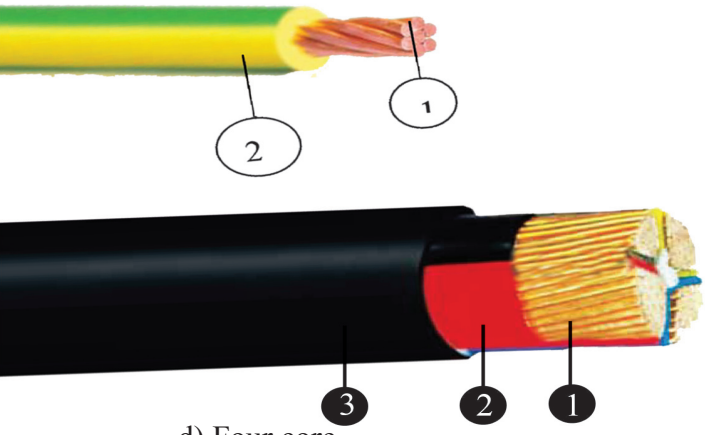
■ 160 °C for sizes < 300 mm2

■ 140 °C for sizes > 300 mm2

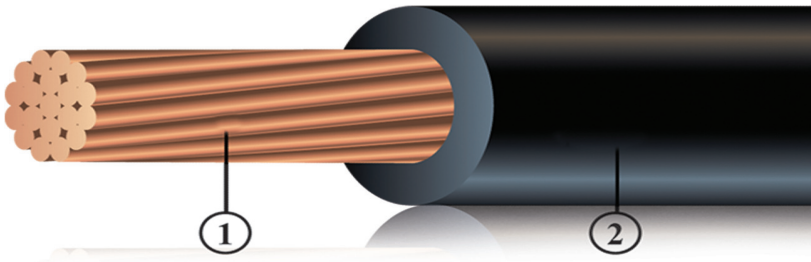
Color: for insulation

- One core: Black .Four core: Red. Yellow, blue, black
- Two cores: Red. Black . Color for Sheath :grey for single core
- Three cores: Red, Yellow . Black for two or more core

Application: For fixed installations in dry or humid places as well as in the open air.



d) Four core



1. Stranded copper
2. PVC primary insulation
3. PVC outer sheath (Jacket)

2.2.1.1 PVC Insulated Single Core Class-2 (Stranded) Copper Cnductors(Cu/PVC)

Product type	Nominal Cross Sectional Area in mm2	lumber Nominal of Diameter Strands of Copper in single strand mm						
CPR-0000-04-01-11	1.5	7	0.53	0.8	3.2	2.3	12.10	0.0100
CPR-0000-04-01-13	2.5	7	0.67	0.8	3.9	3.5	7.410	0.0090
CPR-0000-04-01-16	4	7	0.85	1.0	4.4	5.2	4.610	0.0077
CPR-0000-04-01-20	6	7	1.04	1.0	5.0	7.3	3.080	0.0065
CPR-0000-04-01-21	10	7	1.35	1.0	6.4	12.2	1.830	0.0065
CPR-0000-04-01-22	16	7	1.70	1.0	7.4	18.4	1.150	0.0050
CPR-0000-04-01-23	25	7	2.14	1.2	9.2	28.9	0.727	0.0050
CPR-0000-04-01-24	35	7	2.52	1.2	10.4	39.0	0.524	0.0043
CPR-0000-04-01-25	50	19	1.78	1.4	12.3	55.7	0.387	0.0043
CPR-0000-04-01-26	70	19	2.14	1.4	14.0	76.5	0.268	0.0035
CPR-0000-04-01-27	95	19	2.52	1.6	16.2	103.0	0.193	0.0035
CPR-0000-04-01-28	120	37	2.03	1.6	17.7	128.5	0.153	0.0032
CPR-0000-04-01-29	150	37	2.25	1.8	19.7	158.1	0.124	0.0032
CPR-0000-04-01-30	185	37	2.52	2.0	22.0	198.2	0.0991	0.0032
CPR-0000-04-01-31	240	61	2.25	2.2	25.0	259.4	0.0754	0.0032
CPR-0000-04-01-32	300	61	2.52	2.4	27.9	324.5	0.0601	0.0030
CPR-0000-04-01-33	400	61	2.85	2.6	31.3	413.4	0.047	0.0028
CPR-0000-04-01-34	500	61	3.20	2.8	35.1	528.6	0.0366	0.0028
CPR-0000-04-01-35	630	127	2.52	2.8	38.8	669.1	0.0283	0.0025

2.2.2. Two-Five cores PVC insulated & PVC sheathed class 2(standed) copper conductors (Cu/PVC/PVC)

Product code	Nominal Cross Sectional Area in mm2	Approximate Approximate overall di- weight in ameter mm kg/lOOm		Max. Conductor DC tesistance at 20°C in!2/km at	Min Insulation Resistance 70°C in 12*km
Two core					
CPR-000PJ-04-02-11	1.5	10.2	11.6	12.100	0.0100
CPR-000PJ-04-02-13	2.5	11.2	14.3	7.410	0.0090
CPR-000PJ-04-02-16	4	12.2	18.6	4.610	0.0077
CPR-000PJ-04-02-20	6	15.3	24.0	3.080	0.0065
CPR-000PJ-04-02-21	10	17.2	38.3	1.830	0.0065
CPR-000PJ-04-02-22	16	20.4	53.2	1.150	0.0050
CPR-000PJ-04-02-23	25	23.1	78.4	0.727	0.0050
CPR-000PJ-04-02-24	35	28.8	104.7	0.524	0.0043
Three core					
CPR-000PJ-04-03-11	1.5	10.4	13.2	12.100	0.0100
CPR-000PJ-04-03-13	2.5	11.4	17.9	7.410	0.0090
CPR-000PJ-04-03-16	4	12.4	23.8	4.610	0.0077
CPR-000PJ-04-03-20	6	15.4	31.3	3.080	0.0065
CPR-000PJ-04-03-21	10	17.3	50.6	1.830	0.0065
CPR-000PJ-04-03-22	16	20.5	71.7	1.150	0.0050
CPR-000PJ-04-03-23	25	23.1	107.4	0.727	0.0050
CPR-000PJ-04-03-24	35	28.8	143.9	0.524	0.0043
Four core					
CPR-000PJ-04-04-11	1.5	11.5	15.6	12.100	0.0100
CPR-000PJ-04-04-13	2.5	12.6	21.4	7.410	0.0090
CPR-000PJ-04-04-16	4	13.8	29.0	4.610	0.0077
Four core with one reduced neutral conductor					
CPR-000PJ-04-04-20	6	17.2	38.5	3.080	0.0065
CPR-000PJ-04-04-21	10	19.4	62.5	1.830	0.0065
CPR-000PJ-04-04-22	16	23.1	89.7	1.150	0.0050
CPR-000PJ-04-04-23	25	26.0	135.2	0.727	0.0050
CPR-000PJ-04-04-24	35	32.2	181.9	0.524	0.0043
CPR-000PJ-04-04-25	50	36.2	269.4	0.387	0.0043
CPR-000PJ-04-04-26	70	41.3	364.3	0.268	0.0035
CPR-000PJ-04-04-27	95	44.4	484.5	0.193	0.0035
CPR-000PJ-04-04-28	120	49.6	594.1	0.153	0.0032
CPR-000PJ-04-04-29	150	55.0	734.1	0.124	0.0032
CPR-000PJ-04-04-30	185	61.7	913.4	0.0991	0.0032
CPR-000PJ-04-04-31	240	67.6	1183.4	0.0754	0.0032
CPR-000PJ-04-04-32	300	76.5	1461.4	0.0601	0.0030

CPR-000PJ-04-04-(23+22)	25	22.6	130.2	0.727	0.0050
CPR-000PJ-04-04-(24+22)	35	28.3	166.0	0.524	0.0043
CPR-000PJ-04-04-(25+23)	50	31.8	260.3	0.387	0.0043
CPR-000PJ-04-04-(26+23)	70	36.1	372.5	0.268	0.0035
CPR-000PJ-04-04-(27+24)	95	38.8	480.4	0.193	0.0035
CPR-000PJ-04-04-(28+26)	120	43.3	576.9	0.153	0.0032
CPR-000PJ-04-04-(29+26)	150	47.9	725.7	0.124	0.0032
CPR-000PJ-04-04-(30+27)	185	53.7	897.6	0.0991	0.0032
CPR-000PJ-04-04-(31+27)	240	58.6	1147.5	0.0754	0.0032
CPR-000PJ-04-04-(32+28)	300	64.4	1391.1	0.0601	0.0030
CPR-000PJ-04-04-(33+29)	400	67.3	1720.2	0.047	0.0028
		Five core			
CPR-000PJ-04-05-21	10	23.6	77.5	1.830	0.0065
CPR-000PJ-04-05-22	16	26.8	112.0	1.150	0.0050
CPR-000PJ-04-05-23	25	32.9	170.3	0.727	0.0050
CPR-000PJ-04-05-24	35	37.8	228.9	0.524	0.0043
CPR-000PJ-04-05-25	50	42.3	336.7	0.387	0.0043
CPR-000PJ-04-05-26	70	46.4	457.2	0.268	0.0035
CPR-000PJ-04-05-27	95	52.1	607.7	0.193	0.0035
CPR-000PJ-04-05-28	120	58.1	747.7	0.153	0.0032
CPR-000PJ-04-05-29	150	65.0	923.9	0.124	0.0032
CPR-000PJ-04-05-30	185	71.0	1151.1	0.0991	0.0032
CPR-000PJ-04-05-31	240	78.8	1492.5	0.0754	0.0032
CPR-000PJ-04-05-32	300	84.2	1845.8	0.0601	0.0030

Note: Each data has manufacturing tolerance 6%

2.3. PVC Insulated Class-2 PP filled & PVC sheated conductor.

Construction

- Conductor: Plain Annealed Copper
- Conductor Stranding: Class 2 stranded circular or compacted conductors per IEC60228&60502-1.
- Assembly :A number wires twisted to form round conductor
- Insulation : PVC Compound Type ST1 per IEC60502-lor PVC typeTllper

BSEN50363 Technical Data

- Rated voltage: Uo/U : 0.6/1 .Ok V. Power frequency test voltage 3.5 kV for 5 minute
- Maximum admissible temperature of conductor at normal operation 70 °C
- Maximum admissible temperature of conductor at short circuit for 5 seconds

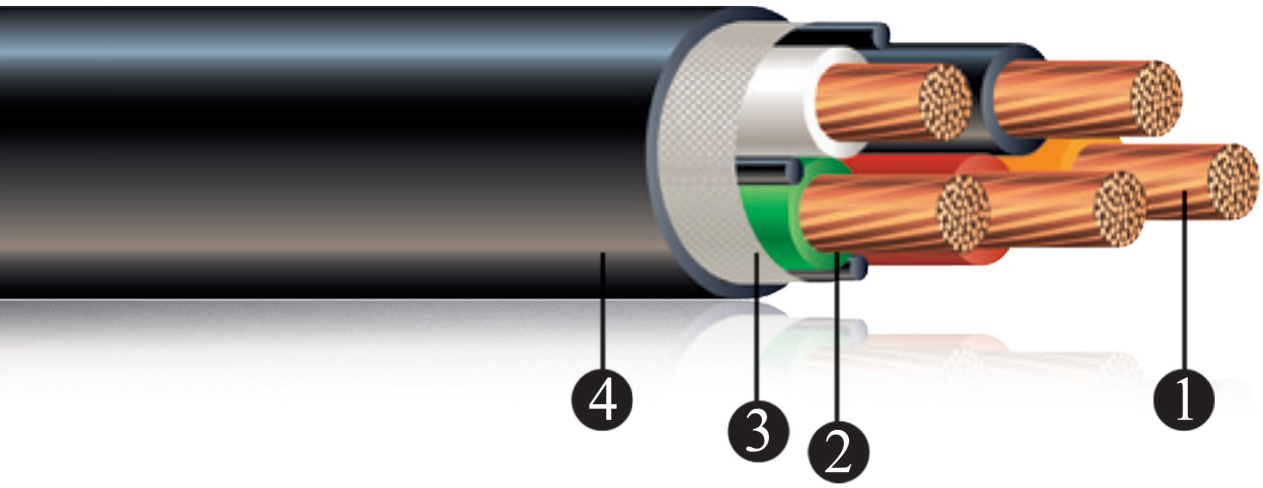
■ 140 °C for sizes < 300 mm2 . 160 °C for sizes > 300 mm2

Color: for insulation

- One core: Black .Four core: Red. Yellow, blue, black
- Two cores: Red. Black . Color for Sheath :grey for single core

• Three cores: Red, Yellow . Black for two or more core

Application: For indoor and outdoor installation in dump and wet area for the distribution of power in power stations and industrial areas which is not exposed to mechanical damage.



Where 1.Stranded copper 2. PVC insulation 3. PP Filler 4. PVC outer Sheath

2.3.1 Two-Five core PVC insulated,PP filled & PVC sheathed stranded copper conductor(Cu/PVC/PP/Pvc)

Product code

		Two core			
CPR-PP00PJ-04-02-11	1.5	10.4	12.4	12.100	0.0100
CPR-PP00PJ-04-02-13	2.5	11.8	16.9	7.410	0.0090
CPR-PP00PJ-04-02-16	4	12.6	21.9	4.610	0.0077
CPR-PP00PJ-04-02-20	6	14.9	28.1	3.080	0.0065
CPR-PP00PJ-04-02-21	10	16.4	46.4	1.830	0.0065
CPR-PP00PJ-04-02-22	16	19.6	63.6	1.150	0.0050
CPR-PP00PJ-04-02-23	25	22.4	97.2	0.727	0.0050
CPR-PP00PJ-04-02-24	35	27.4	128.4	0.524	0.0043
		Three core			
CPR-PP00PJ-04-03-11	1.5	11.5	15.0	12.100	0.0100
CPR-PP00PJ-04-03-13	2.5	12.4	20.5	7.410	0.0090
CPR-PP00PJ-04-03-16	4	13.4	26.9	4.610	0.0077
CPR-PP00PJ-04-03-20	6	17.1	34.9	3.080	0.0065
CPR-PP00PJ-04-03-21	10	18.9	55.6	1.830	0.0065
CPR-PP00PJ-04-03-22	16	22.7	77.8	1.150	0.0050
CPR-PP00PJ-04-03-23	25	25.8	117.0	0.727	0.0050
CPR-PP00PJ-04-03-24	35	31.5	153.5	0.524	0.0043
		Four core			
CPR-PP00PJ-04-04-11	1.5	12.7	18.6	12.100	0.0100
CPR-PP00PJ-04-04-13	2.5	13.7	25.8	7.410	0.0090
CPR-PP00PJ-04-04-16	4	14.7	34.3	4.610	0.0077

CPR-PP00PJ-04-04-20	6	18.2	44.9	3.080	0.0065
CPR-PP00PJ-04-04-21	10	20.0	72.1	1.830	0.0065
CPR-PP00PJ-04-04-22	16	23.7	101.6	1.150	0.0050
CPR-PP00PJ-04-04-23	25	26.2	154.0	0.727	0.0050
CPR-PP00PJ-04-04-24	35	32.5	202.6	0.524	0.0043
CPR-PP00PJ-04-04-25	50	35.9	296.2	0.387	0.0043
CPR-PP00PJ-04-04-26	70	40.8	394.9	0.268	0.0035
CPR-PP00PJ-04-04-27	95	43.6	524.9	0.193	0.0035
CPR-PP00PJ-04-04-28	120	48.5	640.8	0.153	0.0032
CPR-PP00PJ-04-04-29	150	53.6	788.8	0.124	0.0032
CPR-PP00PJ-04-04-30	185	60.0	981.8	0.0991	0.0032
CPR-PP00PJ-04-04-31	240	65.5	1270.8	0.0754	0.0032
CPR-PP00PJ-04-04-32	300	78.2	1573.3	0.0601	0.0030

Four core with one reduced neutral

CPR-PP00PJ-04-04-(23+22)	25	25.1	117.5	0.727	0.0050
CPR-PP00PJ-04-04-[24+22)	35	31.0	154.8	0.524	0.0043
CPR-PP00PJ-04-04-[25+23)	50	35.0	226.1	0.387	0.0043
CPR-PP00PJ-04-04-[26+23)	70	38.7	303.8	0.268	0.0035
CPR-PP00PJ-04-04-(27+24)	95	42.0	398.3	0.193	0.0035
CPR-PP00PJ-04-04-[28+25)	120	46.8	494.3	0.153	0.0032
CPR-PP00PJ-04-04-(29+25)	150	52.2	588.1	0.124	0.0032
CPR-PP00PJ-04-04-[30+26)	185	57.9	732.1	0.0991	0.0032
CPR-PP00PJ-04-04-[31+27)	240	62.7	935.4	0.0754	0.0032
CPR-PP00PJ-04-04-[32+28)	300	69.0	1144.1	0.0601	0.0030
CPR-PP00PJ-04-04-[33+29)	400	78.6	1429.6	0.047	0.0028

Five core

CPR-PP00PJ-04-05-21	10	26.5	88.4	1.830	0.0065
CPR-PP00PJ-04-05-22	16	29.6	125.2	1.150	0.0050
CPR-PP00PJ-04-05-23	25	36.9	190.4	0.727	0.0050
CPR-PP00PJ-04-05-24	35	40.9	250.6	0.524	0.0043
CPR-PP00PJ-04-05-25	50	46.9	365.2	0.387	0.0043
CPR-PP00PJ-04-05-26	70	50.4	487.2	0.268	0.0035
CPR-PP00PJ-04-05-27	95	56.1	649.1	0.193	0.0035
CPR-PP00PJ-04-05-28	120	62.0	793.6	0.153	0.0032
CPR-PP00PJ-04-05-29	150	69.5	976.9	0.124	0.0032
CPR-PP00PJ-04-05-30	185	76.1	1216.8	0.0991	0.0032
CPR-PP00PJ-04-05-31	240	83.9	1576.3	0.0754	0.0032
CPR-PP00PJ-04-05-32	300	88.8	1953.5	0.0601	0.0030

2.4. PVC insulared,PVC bedding, steel Tape armored stranded conductor.

Construction

Conductor: Plain annealed stranded circular copper conductor, as per Class 2 of 1EC 60228.

• Insulation: An extruded layer of polyvinyl chloride (PVC) insulation rated 90 °C at normal operation

to 1EC 60502-1.

• Bedding: An extruded layer of Polyvinyl chloride (PVC)

• Armor: double layer of galvanized steel tape.

• Outer sheath: An extruded layer of Polyvinyl chloride (PVC) sheathing compound type ST2 to IEC 60502-1.

Technical Data

• Rated voltage/Uo;0.6/1.0(1.2)kV

• Power frequency test voltage 3.5 kV for 5 minutes

• Maximum admissible temperature of conductor at normal operation 70 °C

• Maximum admissible temperature of conductor at short circuit for 5 seconds

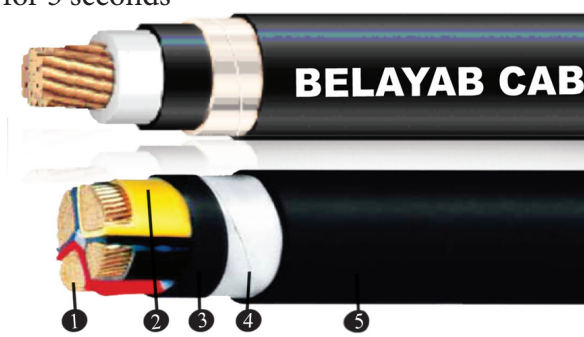
▪ 160 °C for sizes <300 mm2

▪ 140°Cfor sizes > 300 mm2

Color: for insulation

• One core: Black .Four core: Red. Yellow, blue, black

• Two cores: Red. Black . Color for Sheath :grey for single core



2.4.1. Two-four core PVC Insulated, PVC bedding, Steel tape armored & PVC sheathed standed conduc tors(Cu/PVC/STA/PVC)

Product code	Nominal Cross Sectional Area in mm2	Steel tape Armored thickness mm	Approximate >verall diameter mm	Approximat e weight in
		Two core		
CPR-PI0TPJ-04-02-11	4	0.2	14.4	40.0
CPR-PI0TPJ-04-02-13	6	0.2	17.0	58.3
CPR-PI0TPJ-04-02-16	10	02	18.5	75.5
CPR-PI0TPJ-04-02-20	16	0.2	22.7	130.0
CPR-PI0TPJ-04-02-21	25	0.5	24.9	159.6
CPR-PIOTPJ-04-02-22	35	0.5	29.9	219.2
		Three core		
CPR-PIOTPJ-04-03-11	4	0.2	17.9	49.4
CPR-PIOTPJ-04-03-13	6	02	21.5	60.9

CPR-PIOTPJ-04-03-16	10	0.2	23.3	91.8
CPR-PI0TpJ-04-03-20	16	0.2	28.6	138.1
CPR-PIOTPJ-04-03-21	25	0.5	31.1	193.5
CPR-PIOTPJ-04-03-22	35	0.5	37.3	247.9
		Four core		
CPR-PIOTPJ-04-04-16	4	0.2	18.9	55.8
CPR-PIOTPJ-04-04-20	6	0.2	23.0	67.3
CPR-PIOTPJ-04-04-21	10	0.2	25.3	99.1
CPR-PIOTPJ-04-04-22	16	02	31.3	147.6
CPR-PIOTPJ-04-04-23	25	0.5	34.3	
CPR-PIOTPJ-04-04-24	35	0.5	41.2	254.6
CPR-PIOTPJ-04-04-25	50	0.5	45.3	274.6
CPR-PIOTPJ-04-04-26	70	0.5	51.2	398.2
CPR-PIOTPJ-04-04-27	95	0.5	56.1	521.3
CPR-PIOTPJ-04-04-28	120	0.8	62.0	635.6
CPR-PIOTPJ-04-04-29	150	0.8	68.2	766.1
CPR-PIOTPJ-04-04-30	185	0.8	75.8	945.7
CPR-PIOTPJ-04-04-31	240	0.8	82.5	1281.1
CPR-PIOTPJ-04-04-32	300	0.8	88.6	1468.6
		four core with one reduced neutral		
CPR-PIOTPJ-04-04-(23+22)	25	0.5	28.3	177.6
CPR-PIOTPJ-04-04-(24+22)	35	0.5	34.9	187.6
CPR-PIOTPJ-04-04-(25+23]	50	0.5	41.5	248.5
CPR-PIOTPJ-04-04-(26+23)	70	0.5	45.3	318.5
CPR-PIOTPJ-04-04-(27+24)	95	0.5	50.7	463.6
CPR-PIOTPJ-04-04-(28+25)	120	0.8	55.4	555.1
CPR-PIOTPJ-04-04-(29+25)	150	0.8	60.9	678.3
CPR-PIOTPJ-04-04-(30+26)	185	0.8	66.6	835.7
CPR-PIOTPJ-04-04-(31+27)	240	0.8	73.6	1062.3
CPR-PIOTPJ-04-04-(32+28)	300	0.8	79.7	1298.0
CPR-PIOTPJ-04-04-(33+29)	400	0.8	86.9	1663.1

2.5. PVC insulated,PVC bedding,steel wire armored stranded conductor

Conductor: Plain annealed stranded circular copper conductor, as per Class 2 of IEC 60228.

• Insulation: An extruded layer of polyvinyl chloride (PVC) insulation rated 90 °C at normal operation to IEC 60502-1.

• Bedding: An extruded layer of Polyvinyl chloride (PVC).

• Armor: galvanized steel wire.

• Outer sheath: An extruded layer of Polyvinyl chloride (PVC) sheathing compound type ST2 to

IEC 60502-1.

• Power frequency test voltage 3.5 kV for 5 minutes

• Maximum admissible temperature of conductor at normal operation 70 °C

• Maximum admissible temperature of conductor at short circuit for 5 seconds

■ 160 °C for sizes <300 mm2

■ 140 °C for sizes >300 mm2

Color: for insulation

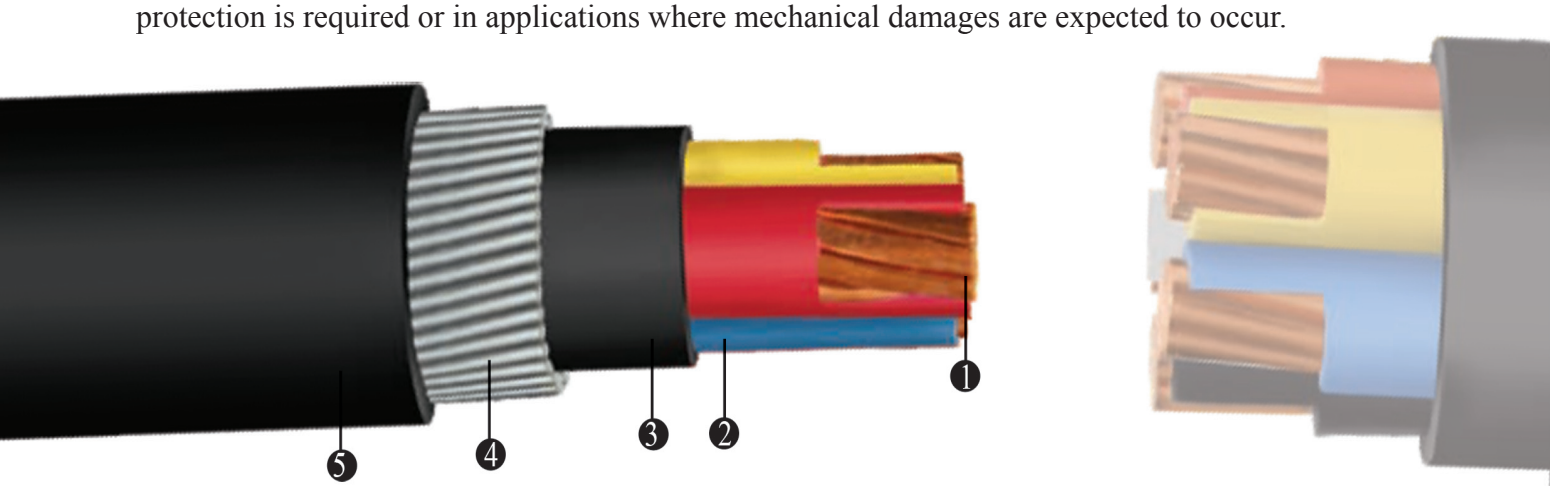
• One core: Black .Four core: Red. Yellow, blue, black

• Two cores: Red. Black . Color for Sheath :grey for single core

• Three cores: Red, Yellow .Black for two or more core

Application: For outdoor installations in power stations, industrial plants and switchgears if mechanical

protection is required or in applications where mechanical damages are expected to occur.



1.Stranded copper conductor. 2. PVC primary insulation. 3. PVC inner sheath. 4. Galvanized steel armor .5. PVC outer sheath (Jacket)

2.5.1 Two-four cores PVC insulated,PVC bedding,steel wire armored stranded conducto(CU/PVC/SWA/PVC)

Product code	Nominal Cross sectional Area	Armor wire diameter mm	Approximate over-all diameter mm	Approximate weight in kg/lOOm
		Two core		
CPR-PICTWP-04-02-16	4	0.8	17.3	67.1
CPR-PICTWP-04-02-20	6	0.8	18.1	78.8
CPR-PICTWP-04-02-21	10	0.8	19.6	96.9
CPR-PIOWPJ-04-02-22	16	0.8	22.5	107.9
CPR-PIOWPJ-04-02-23	25	0.9	24.6	148.1
CPR-PIOWPJ-04-02-24	35	0.9	30.6	207.2

Three core				
CPR-PIOWPJ-04-03-16	4	0.8	18.0	75.3
CPR-PICTWJ-04-03-20	6	0.8	19.0	85.3
CPR-PIOWPJ-04-03-21	10	0.8	22.5	101.4
CPR-PIOWPJ-04-03-22	16	0.8	24.4	122.5
CPR-PIOWPJ-04-03-23	25	0.9	28.3	178.2
CPR-PIOWPJ-04-03-24	35	0.9	30.9	216.7
Four core				
CPR-PIOWPJ-04-04-16	4	0.8	18.7	87.4
CPR-PIOWPJ-04-04-20	6	0.8	21.3	94.1
CPR-PIOWPJ-04-04-21	10	0.8	24.1	119.6
CPR-PIOWPJ-04-04-22	16	0.8	26.3	152.4
CPR-PIOWPJ-04-04-23	25	0.9	31.0	215.6
CPR-PIOWPJ-04-04-24	35	0.9	34.0	269.7
CPR-PIOWPJ-04-04-25	50	1.25	41.9	401.2
CPR-PIOWPJ-04-04-26	70	1.25	46.0	508.7
CPR-PIOWPJ-04-04-27	95	1.25	48.9	659.8
CPR-PIOWPJ-04-04-28	120	1.6	56.1	800.3
CPR-PIOWPJ-04-04-29	150	1.6	62.0	965.4
CPR-PIOWPJ-04-04-30	185	1.6	68.2	1170.4
CPR-PIOWPJ-04-04-31	240	1.6	75.8	1470.4
CPR-PIOWPJ-04-04-32	300	1.6	82.5	1784.4
Four core with one reduced neutral conductor				
CPR-PIOWPJ-04-04-23+22)	25	0.9	27.8	175.5
CPR-PIOWPJ-04-04-(24+22)	35	0.9	31.9	236.1
CPR-PIOWPJ-04-04-(25+23)	50	1.25	35.6	358.6
CPR-PIOWPJ-04-04-(26+23)	70	1.25	42.1	431.4
CPR-PIOWPJ-04-04-[27+24]	95	1.25	46.0	553.8
CPR-PIOWPJ-04-04-(28+25)	120	1.6	51.4	744.3
CPR-PIOWPJ-04-04-(29+25)	150	1.6	55.4	855.7
CPR-PIOWPJ-04-04-[30+26)	185	1.6	60.9	1030.2
CPR-PIOWPJ-04-04-(31+27]	240	1.6	66.6	1288.0
CPR-PIOWPJ-04-04-(32+28)	300	1.6	73.6	1563.1
CPR-PIOWPJ-04-04-(33+29)	400	1.6	79.7	1928.0

2.6. PVC insulated flexible cable

Construction

• Conductor : Plain Annealed Copper

• Conductor assembly: A number of wires twisted to form round conductor .Class 5 Bunched circular or compacted conductors per ICE 60228 , 60227-5 &BS EN6004

Technical Data

• Nominal voltage, U/Uo;300/500 volt

• Power frequency test voltage 3.5 kV for 5 minutes

• Maximum admissible temperature of conductor at normal operation 70 °C.

• Maximum admissible temperature of conductor at short circuit for 5 seconds.

■ 160 °C for sizes < 300 mm2

■ 140 °C for sizes >300 mm2

Color: for insulation

• One core: Black . Fourcore: Red. Yellow, blue, black

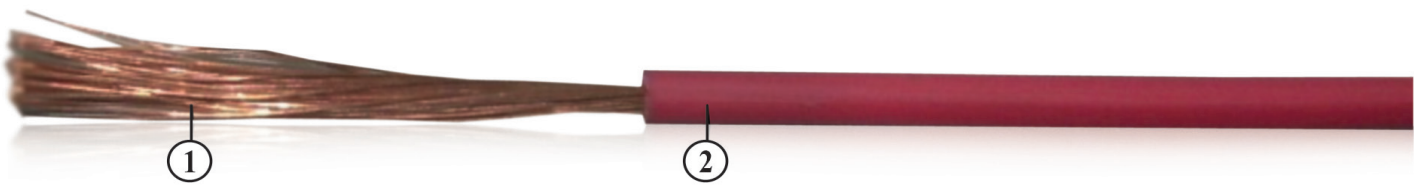
• Two cores: Red. Black . Color for Sheath: grey for single core .

• Three cores: Red, Yellow, Blue . Black for two or more core

Application: for indoor and outdoor installation, to connect instruments, for movable welding machine connection that required extra flexibility.

2.6.1. Single core PVC insulated flexible wire(Cu/PVC)

Rated voltage, U/Uo, 300/300 volt based on BS EN6004.



1. Annealed Cu bunched wire

2. PVC Primary insulation

3roduct code	NominalCross Sectional Area in mm2	:hickness ol Insulation mm	Approxi mate over ill diameter in mm	Approximate Max. Conduc-over all tor DC Re-i/Veightof in sistanceat kg/lOOm 20°C in.fi/km		Min Insula-tion Resist-ance at70°C infi*km
			Single core			
CPF-0000-03-01-05	0.5	0.6	2.2	0.8	39.0	0.013
CPF-0000-03-01-07	0.75	0.6	2.5	1.1	26.0	0.011
CPF-0000-03-01-10	1.0	0.7	2.6	1.5	19.5	0.010
			Two core			
CPF-0000-03-02-05	0.75	0.8	4.8	4.4	26.0	0.011
CPF-0000-03-02-07	1	0.8	5.0	5.5	19.5	0.010
CPF-000PJ-04-02-11	1.5	0.8	5.1	8.7	13.30	0.0100
CPF-000PJ-04-02-13	2.5	OOO	6.8	11.8	7.98	0.0090
CPF-000PJ-04-02-16	4	1.0	7.4	15.4	4.95	0.0077

2.6.2. Rated voltage,up to and including U/Uo;450/750 volt based on BS 6004

Construction

• Conductor : Plain Annealed Copper

• Conductor assembly: A number of wires twisted to form round conductor .Class 5 Bunched circular or compacted conductors per ICE 60228 , 60227-5 &BS EN6004

Technical Data

• Nominal voltage, up to and including U/Uo; 450/750 volt

• Power frequency test voltage 3.5 kV for 5 minutes

• Maximum admissible temperature of conductor at normal operation 70 °C.

• Maximum admissible temperature of conductor at short circuit for 5 seconds.

■ 160 °C for sizes < 300 mm2

■ 140 °C for sizes > 300 mm2

Color: for insulation

• One core: Black . Fourcore: Red.Yellow,blue,black

• Two cores: Red. Black .Color forSheath:grey for single core .

• Three cores: Red, Yellow, Blue . Black for two or more core

Application: for indoor and outdoor installation, to connect instruments, for movable welding machine

connection that required extra flexibility.

2.6.3. Single core PVC/PVC Insuleted flexible Cable,Circular sheathed(Cu/PVC/PVC)

Product code	Nominal Humber	Nominal Radial	Approxi-	Approxi-	Max. Con-	Min	Cross Sec- of Insulation tional Area	Resistance in mm2
CPF-0000-04-01-20	6	84	0.31	0.8	4.9	68	3.300	0.0060
CPF-0000-04-01-21	10	76	0.41	1.0	6.3	114	2.290	0.0056
CPF-0000-04-01-22	16	122	0.41	1.0	7.4	176	1.450	0.0046
CPF-0000-04-01-23	25	180	0.41	1.2	9.3	259	0.940	0.0044
CPF-0000-04-01-24	35	265	0.41	1.2	10.7	372	0.663	0.0038
CPF-0000-04-01-25	50	379	0.41	1.4	12.7	529	0.462	0.0037
CPF-0000-04-01-26	70	343	0.51	1.4	14.6	728	0.326	0.0032
CPF-0000-04-01-27	95	465	0.51	1.6	16.7	983	0.247	0.0032

2.6.4. Two-Four core PVC Insuleted Flexible Cable(Cu/PVC/PVC)

Product code	Nominal Cross Sectional Area in mm.	Ap proximate overall diameter mm	Approximate weight in kg/lOOm	Vlax. Conduc- Min tor DC Re-Insulation sistance at Resistance 20°Cin/2/km at 70°C ini2*km	
		Two core			
CPF-PI00PJ-04-02-20	6	8.1	22.45	3.300	0.0065
CPF-PI00PJ-04-02-21	10	9.8	34.52	1.910	0.0065
CPF-PI00PJ-04-02-22	16	10.4	47.89	1.210	0.0050
CPF-PI00PJ-04-02-23	25	11.7	67.10	0.780	0.0050
CPF-PI00PJ-04-02-24	35	13.1	92.81	0.554	0.0043
CPF-PI00PJ-04-02-25	50	14.2	139.33	0.386	0.0043
		Three core			
CPF-PI00PJ-04-03-11	1.5	8.4	11.55	13.300	0.0100
CPF-PI00PJ-04-03-13	2.5	8.8	16.02	7.98	0.0090
CPF-PI00PJ-04-03-16	4	9.2	21.39	4.950	0.0077
CPF-PI00PJ-04-03-20	6	11.2	28.30	3.300	0.0065
CPF-PI00PJ-04-03-21	10	12.0	43.65	1.910	0.0065
CPF-PI00PJ-04-03-22	16	13.6	62.65	1.210	0.0050
CPF-PI00PJ-04-03-23	25	15.2	88.37	0.780	0.0050
CPF-PI00PJ-04-03-24	35	19.6	124.91	0.554	0.0043
		Four core			
CPF-PI00PJ-04-04-11	1.5	9.3	14.14	13.300	0.0100
CPF-PI00PJ-04-04-13	2.5	9.7	19.91	7.98	0.0090
CPF-PI00PJ-04-04-16	4	10.2	26.91	4.950	0.0077
CPF-PI00PJ-04-04-20	6	12.5	35.95	3.300	0.0065
CPF-PI00PJ-04-04-21	10	13.4	55.62	1.910	0.0065
CPF-PI00PJ-04-04-22	16	15.1	80.57	1.210	0.0050
CPF-PI00PJ-04-04-23	25	16.9	114.29	0.780	0.0050
CPF-PI00PJ-04-04-24	35	21.8	161.91	0.554	0.0043
CPF-PI00PJ-04-04-25	50	23.9	240.45	0.386	0.0043
CPF-PI00PJ-04-04-26	70	26.9	324.42	0.272	0.0035
CPF-PI00PJ-04-04-27	95	28.2	432.97	0.206	0.0035

2.7. XLPE/PVC insulated stranded copper conductors

Construction

• Conductor : Plain Annealed Copper

• Insulation : XLPE Compound per IEC 60502-1

• Bedding :PVC type ST2 per IEC 60502-1 or BSEN50363 or pp filler

• Sheath: PVC type ST2 per IEC 60502 -1 or BSEN50363

Color: for insulation

One core: Black Thrcc cores: Red Ycllow- Blue

Two cores: Red. Black Follr core: Red' Yellow-blue-black

• Conductor assembly: A number of wires twisted to form round compacted conductors per IEC 60228 Single core Color for Sheath: grey for single core Black for two or more core conductor .Class 2 stranded circular o

TECHNICAL DATA

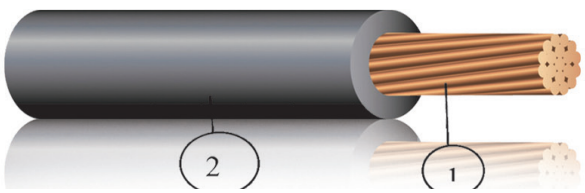
Nominal voltage Uo/U = 0.6/1 kV

• Power frequency test voltage 3.5 kV for 5 minutes

• Maximum admissible temperature of conductor at normal operation 90 °C.

• Maximum admissible temperature of conductor at short circuit 250 °C for 5 seconds. Application: For indoors use in cable trenches or ducts.

2.7.1. XLPE insulated stranded conductor(Cu/XLPE)



1. Annealed stranded copper conductor
2. XLPE primary insulation

CXR-0000-04-01-11	1.5	7	0.53	0.7	3.2	1.7	12.100
CXR-0000-04-01-13	2.5	7	0.67	0.7	3.9	2.5	7.410
CXR-0000-04-01-16	4	7	0.85	0.7	4.4	3.2	4.610
CXR-0000-04-01-20	6	7	1.04	0.7	5.0	4.1	3.080
CXR-0000-04-01-21	10	7	1.35	0.7	6.4	6.7	1.830
CXR-0000-04-01-22	16	7	1.70	0.7	7.4	9.1	1.150
CXR-0000-04-01-23	25	7	2.14	0.9	9.1	13.6	0.727
CXR-0000-04-01-24	35	7	2.52	0.9	10.3	17.5	0.524
CXR-0000-04-01-25	50	19	1.78	1.0	12.3	24.8	0.387
CXR-0000-04-01-26	70	19	2.17	1.1	13.6	30.6	0.268
CXR-0000-04-01-27	95	19	2.52	1.1	16.1	42.6	0.193
CXR-0000-04-01-28	120	37	2.03	1.2	17.6	50.7	0.153
CXR-0000-04-01-29	150	37	2.25	1.4	19.7	63.9	0.124
CXR-0000-04-01-30	185	37	2.52	1.6	21.9	78.9	0.0991
CXR-0000-04-01-31	240	61	2.25	1.8	25.0	103.2	0.0754
CXR-0000-04-01-32	300	61	2.52	1.8	27.7	126.4	0.0601

CXR-0000-04-01-33	400	61	2.85	2.0	31.6	164.6	0.047
CXR-0000-04-01-34	500	61	3.20	2.2	35.1	202.7	0.0366
CXR-0000-04-01-35	630	127	2.52	2.4	38.5	243.9	0.0283

2.7.2. Two-five core XLPE Insulated Stranded conductors (Cu/XLPE/PVC)

	Two core		
CXR-000PJ-04-02-11	1.5	8.7	10.0
CXR-000PJ-04-02-13	2.5	9.5	12.5
CXR-000PJ-04-02-16	4	10.3	16.4
CXR-000PJ-04-02-20	6	12.2	21.2
CXR-000PJ-04-02-21	10	13.7	32.4
CXR-000PJ-04-02-22	16	16.3	45.7
CXR-000PJ-04-02-23	25	18.5	68.4
CXR-000PJ-04-02-24	35	23.2	92.1
	Three core		
CXR-000PJ-04-03-11	1.5	10.0	12.7
CXR-000PJ-04-03-13	2.5	10.9	16.3
CXR-000PJ-04-03-16	4	11.9	21.8
CXR-000PJ-04-03-20	6	14.1	28.6
CXR-000PJ-04-03-21	10	15.9	44.0
CXR-000PJ-04-03-22	16	19.2	63.1
CXR-000PJ-04-03-23	25	21.7	95.5
CXR-000PJ-04-03-24	35	27.0	128.8
	Four core		
CXR-000PJ-04-04-11	1.5	11.0	14.5
CXR-000PJ-04-04-13	2.5	12.1	20.1
CXR-000PJ-04-04-16	4	13.2	27.2
CXR-000PJ-04-04-20	6	15.7	36.1
CXR-000PJ-04-04-21	10	17.8	55.9
CXR-000PJ-04-04-22	16	21.5	80.9
CXR-000PJ-04-04-23	25	24.4	123.2
CXR-000PJ-04-04-24	35	30.1	166.4
CXR-000PJ-04-04-25	50	34.6	245.8
CXR-000PJ-04-04-26	70	38.7	307.0
CXR-000PJ-04-04-27	95	42.3	402.3
CXR-000PJ-04-04-28	120	47.5	507.4
CXR-000PJ-04-04-29	150	52.9	608.6
CXR-000PJ-04-04-30	185	59.1	766.2
CXR-000PJ-04-04-31	240	64.5	1002.8
CXR-000PJ-04-04-32	300	70.3	1245.6

	Four core with one reduced neutral conductor		
CXR-OOOPJ-04-04-(23+22)	25	19.6	112.6
CXR-OOOPJ-04-04-(24+22)	35	24.8	143.5
CXR-OOOPJ-04-04-(25+23)	50	27.2	213.5
CXR-000PJ-04-04-(26+23)	70	30.6	288.8
CXR-OOOPJ-04-04-(27+24)	95	33.7	382.4
CXR-OOOPJ-04-04-(28+25)	120	37.1	479.6
CXR-OOOPJ-04-04-(29+25)	150	40.5	571.6
CXR-OOOPJ-04-04-(30+26)	185	44.3	715.1
CXR-OOOPJ-04-04-C31+27)	240	48.1	917.8
CXR-OOOPJ-04-04-(32+28)	300	54.5	1076.0
CXR-000PJ-04-04-(29+25)	150	40.5	571.6
CXR-000PJ-04-04-C30+26)	185	44.3	715.1
CXR-000PJ-04-04-[31+27]	240	48.1	917.8
CXR-000PJ-04-05-(32+28)	300	54.5	1076.0
	Five core		
CXR-000PJ-04-05-21	10	19.5	64.6
CXR-000PJ-04-05-22	16	23.6	94.9
CXR-000PJ-04-05-23	25	26.8	144.8
CXR-000PJ-04-05-24	35	32.9	197.1
CXR-000PJ-04-05-25	50	37.8	291.2
CXR-000PJ-04-05-26	70	42.3	400.8
CXR-000PJ-04-05-27	95	46.4	529.2
CXR-000PJ-04-05-28	120	52.1	656.6
CXR-000PJ-04-05-29	150	58.1	812.3
CXR-000PJ-04-05-30	185	65.0	1012.9
CXR-000PJ-04-05-31	240	71.0	1312.5
CXR-000PJ-04-05-32	300	83.2	1620.9

2.8. XLPE Insulted,PP filled & PVC sheathed conductor

2.8.1. Two-five core XLPE Insulated,PP,filled & PVC sheathed stranded conductor(Cu/XLPE/PP/PVC)

Product code	Slominal Cross Sectional Area in mm2	Approximate overall diame ter mm	Approximate weight in kg/lOOm
	Two core		
CXR-PP00PJ-04-02-11	1.5	9.5	10.8
CXR-PP00PJ-04-02-13	2.5	10.3	13.2
CXR-PP00PJ-04-02-16	4	11.1	16.9
CXR-PPOOPJ-04-02-20	6	13.4	21.8
CXR-PPOOPJ-04-02-21	10	14.8	33.2
CXR-PPOOPJ-04-02-22	16	17.9	48.6
CXR-PP00PJ-04-02-23	25	20.5	75.7
CXR-PP00PJ-04-02-24	35	25.1	88.2

Three core			
CXR-PP00PJ-04-03-11	1.5	11.0	14.0
CXR-PP00PJ-04-03-13	2.5	12.0	17.4
CXR-PP00PJ-04-03-16	4	13.0	22.6
CXR-PPOOPJ-04-03-20	6	15.7	29.2
CXR-PP00PJ-04-03-21	10	17.6	45.1
CXR-PP00PJ-04-03-22	16	21.3	64.4
CXR-PP00PJ-04-03-23	25	24.4	98.6
CXR-PP00PJ-04-03-24	35	29.7	132.4
Four core			
CXR-PP00PJ-04-04-11	1.5	12.1	16.3
CXR-PP00PJ-04-04-13	2.5	13.2	20.7
CXR-PP00PJ-04-04-16	4	14.3	27.6
CXR-PP00PJ-04-04-20	6	17.3	36.8
CXR-PP00PJ-04-04-21	10	19.4	58.6
CXR-PP00PJ-04-04-22	16	23.7	84.0
CXR-PP00PJ-04-04-23	25	27.1	129.7
CXR-PP00PJ-04-04-24	35	32.8	165.8
CXR-PP00PJ-04-04-25	50	37.3	248.6
CXR-PPOOPJ-04-04-26	70	41.9	331.6
CXR-PP00PJ-04-04-27	95	45.6	434.7
CXR-PP00PJ-04-04-28	120	50.8	535.9
CXR-PP00PJ-04-04-29	150	56.2	661.0
CXR-PP00PJ-04-04-30	185	62.4	820.7
CXR-PP00PJ-04-04-31	240	68.3	1058.8
CXR-PP00PJ-04-04-32	300	74.3	1302.4
Four core with one reduced neutral conductor			
CXR-PP00PJ-04-04-(23+22)	25	21.3	112.6
CXR-PP00PJ-04-04-(24+22)	35	26.6	150.7
CXR-PP00PJ-04-04-(25+23)	50	30.5	219.1
CXR-PP00PJ-04-04-(26+23)	70	34.0	300.6
CXR-PP00PJ-04-04-(27+24)	95	37.0	398.7
CXR-PP00PJ-04-04-(28+25)	120	41.6	501.0
CXR-PP00PJ-04-04-(29+25)	150	46.2	604.3
CXR-PP00PJ-04-04-(30+26)	185	51.5	759.6
CXR-PP00PJ-04-04-(31+27)	240	56.0	978.6
CXR-PP00PJ-04-04-(32+28)	300	61.8	1204.9
CXR-PP00PJ-04-04-(33+29)	400	68.4	1517.1
Five core			
CXR-PP00PJ-04-05-21	10	20.6	63.9
CXR-PP00PJ-04-05-22	16	24.7	91.8
CXR-PP00PJ-04-05-23	25	27.9	137.7
CXR-PP00PJ-04-05-24	35	34.5	185.9

CXR-PP00PJ-04-05-25	50	39.5	278.7
CXR-PP00PJ-04-05-26	70	44.0	379.9
CXR-PP00PJ-04-05-27	95	48.0	497.7
CXR-PP00PJ-04-05-28	120	53.7	613.7
CXR-PP00PJ-04-05-29	150	59.7	757.2
CXR-PP00PJ-04-05-30	185	66.6	940.4
CXR-PP00PJ-04-05-31	240	72.6	1212.9
CXR-PP00PJ-04-05-32	300	84.6	1491.7

2.9. TWo-four cores XLPE Insulated,PVC bedding,PVC sheathed Stranded & Galivanized steel tape armored copper conductor

Construction

• Conductor : Plain Annealed Copper

• Insulation: extruded XLPE Compound rated 90 °C at normal operation to IEC 60502-1.

• Bedding :extruded PVC type ST2 or lapped PVC tape

• Outer Sheath: PVC type ST2

• Armor: galvanized steel tape

Color: for insulation

Two cores: Red, Black

Three cores: Red, Yellow and Blue

Four core: Red. Yellow. Blue. Black

• Color for Sheath: grey for single core

Black for two or more core

• Conductor assembly: Class 2 stranded circular or compacted conductors per IEC 60228 and 60502-2.

• Two or more insulated wires twisted to form round conductor

TECHNICAL DATA

• Rated voltage: up to and including Uo/U : 0.6/1 .OK V

• Power frequency test voltage 3.5 kV for 5 minutes

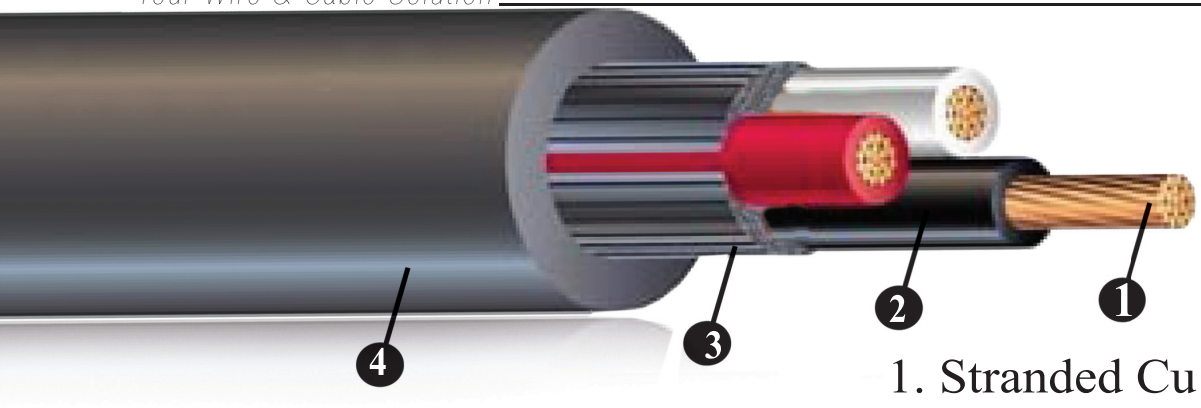
• Maximum admissible temperature of conductor at normal operation 90 °C.

• Maximum admissible temperature of conductor at short circuit 250 °C for 5 seconds.

Application: For outdoor installations in power stations, industrial plants and switchgears if mechanical pro tection is required or in applications where mechanical damages and high temperature are expected to occur.

2.9.2. TWo-four cores XLPE Insulated,PVC bedding & still tape armored standed conductrs(Cu/XLPE/PP/PVC)

Product code	Nominal Cross Sectional Area in mm2	Steel tape Armor thickness mm	Approximate overall diameter mm	Approximate veight in kg/ lOOrr
		Two core		
CXR-PI0TPJ-04-02-21	10	0.2	16.0	60.1
CXR-PI0TPJ-04-02-22	16	0.2	17.5	76.3
CXR-PI0TPJ-04-02-23	25	0.5	21.8	113.6
CXR-PI0TPJ-04-02-24	35	0.5	24.0	141.4
CXR-PI0TPJ-04-02-25	50	0.5	28.6	194.2
		Three core		
CXR-PI0TPJ-04-03-21	10	0.2	17.9	80.7
CXR-PI0TPJ-04-03-22	16	0.2	19.7	103.8
CXR-PI0TPJ-04-03-23	25	0.5	24.6	153.6
CXR-PI0TPJ-04-03-24	35	0.5	27.2	192.6
CXR-PI0TPJ-04-03-25	50	0.5	32.4	263.6
		Four core		
CXR-PI0TPJ-04-04-21	10	0.2	19.5	100.4
CXR-PI0TPJ-04-04-22	16	0.2	21.6	130.4
CXR-PI0TPJ-04-04-23	25	0.5	27.0	192.2
CXR-PI0TPJ-04-04-24	35	0.5	29.8	242.0
CXR-PI0TPJ-04-04-25	50	0.5	35.6	330.1
CXR-PI0TPJ-04-04-26	70	0.5	40.0	427.4
CXR-PI0TPJ-04-04-27	95	0.5	44.1	539.9
CXR-PI0TPJ-04-04-28	120	0.8	49.4	677.0
CXR-PI0TPJ-04-04-29	150	0.8	54.6	811.2
CXR-PI0TPJ-04-04-30	185	0.8	60.0	980.0
		Four core with one reduced neutral conductor		
CXR-PI0TPJ-04-04-(23+22)	25	0.5	29.8	167.6
CXR-PI0TPJ-04-04-(24+22)	35	0.5	32.6	180.4
CXR-PI0TPJ-04-04-(25+23)	50	0.5	40.0	300.0
CXR-PI0TPJ-04-04-(26+23)	70	0.5	44.4	386.4
CXR-PI0TPJ-04-04-(27+24)	95	0.5	48.3	487.5
CXR-PI0TPJ-04-04-(28+25)	120	0.8	53.7	591.1
CXR-PI0TPJ-04-04-(29+25)	150	0.8	58.8	715.4
CXR-PI0TPJ-04-04-(30+26)	185	0.8	63.9	866.3
CXR-PI0TPJ-04-04-(31+27)	240	0.8	69.9	1086.9
CXR-PI0TPJ-04-04-(32+28)	300	0.8	75.1	1312.6
CXR-PI0TPJ-04-04-(33+29)	400	0.8	84.0	1644.6



1. Stranded Cu
2.PVC Insulation
3.PP Filler
4.PVC Sheath

2.10 XLPE primary isulated,PVC sheathed,STW armored stranded copper conductor

• Conductor: Plain annealed stranded circular copper conductor, as per Class 2 of IEC 60228.

• Insulation: An extruded layer of cross linked polyethylene (XLPE) insulation rated 90 °C at normal operation per IEC 60502-1.

• Bedding: An extruded layer of Polyvinyl chloride (PVC).

• Armor: galvanized steel wire.

• Outer sheath: An extruded layer of Polyvinyl chloride (PVC) sheathing compound type ST2 to IEC 60502-1.

Color: for insulation

• Two cores: Red, Black .Color for Sheath: grey for single core

Three cores: Red, Yellow and Blue . Black for two or more core

• Four core: Red. Yellow. Blue. Black

• Conductor assembly: Class 2 stranded circular or compacted conductors per IEC 60228 and 60502-1.

• Two or more insulated wires twisted to form round conductor

TECHNICAL DATA

• Rated voltage: up to and including Uo/U : 0.6/1 .OK V

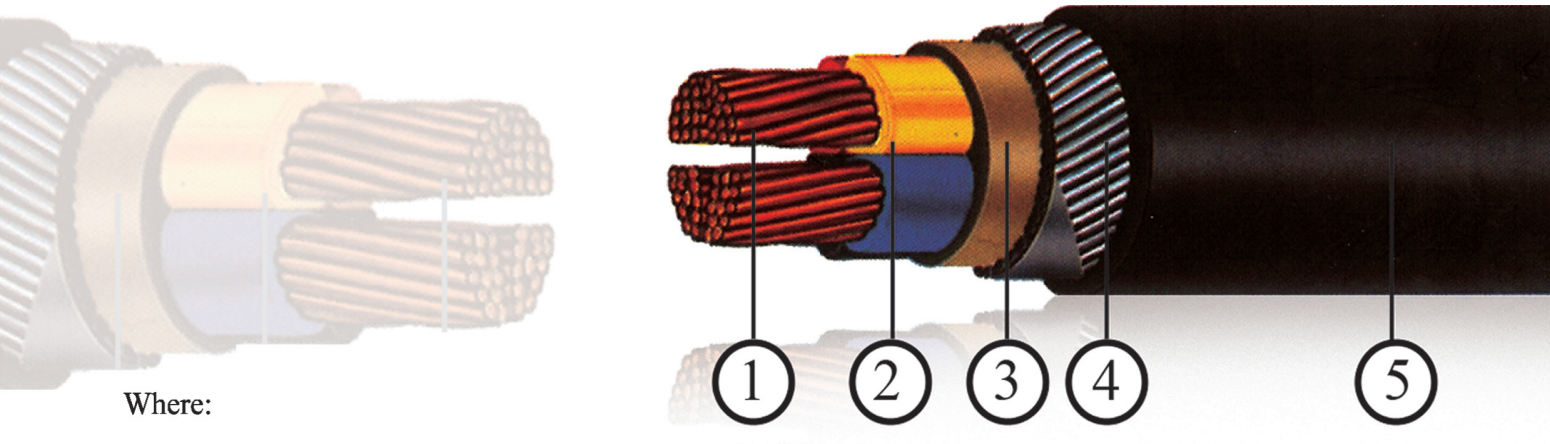
• Power frequency test voltage 3.5 kV for 5 minutes

• Maximum admissible temperature of conductor at normal operation 90 °C.

• Maximum admissible temperature of conductor at short circuit 250 °C for 5 seconds.

Application: For outdoor installations in power stations, industrial plants and switchgears if mechanical

protection is required or in applications where mechanical damages and high temperature are expected to



Where:

1. Stranded copper conductor 2. XLPE primary insulation 3.SWA armor 4.PVC Jacket(outer sheath

2.10.1. Two-four cores XLPE insulted,PVC bedding,steel wire armored stranded conducto(Cu/XLPE/PVC/SWA/PVC)

Product code	NominalCross Sec-:ional Area ir mm2	Armor wire diameter mm	Approximate jverall diameter mm	Approximate weight in kg/lOOm
		Two core		
CXR-PI0WPJ-04-02-21	10	0.8	17.1	73.7
CXR-PIOWPJ-04-02-22	16	0.8	18.6	91.4
CXR-PIOWPJ-04-02-23	25	0.9	21.5	122.5
CXR-PIOWPJ-04-02-24	35	0.9	23.7	151.2
CXR-PI0WPJ-04-02-25	50	1.25	29.3	220.7
		Three core		
CPR-PIOWPJ-04-03-21	10	0.8	19.0	96.7
CPR-PIOWPJ-04-03-22	16	0.8	20.8	121.8
CPR-PIOWPJ-04-03-23	25	0.9	24.3	164.8
CPR-PIOWPJ-04-03-24	35	0.9	26.9	204.9
CPR-PIOWPJ-04-03-25	50	1.25	33.1	296.0
		Four core		
CXR-PIOWPJ-04-04-21	10	0.8	20.6	118.2
CXR-PIOWPJ-04-04-22	16	0.8	22.7	150.4
CXR-PIOWPJ-04-04-23	25	0.9	26.7	204.7
CXR-PIOWPJ-04-04-24	35	0.9	29.6	255.8
CXR-PIOWPJ-04-04-25	50	1.25	36.2	366.4
CXR-PIOWPJ-04-04-26	70	1.25	40.7	468.7
CXR-PIOWPJ-04-04-27	95	1.25	44.8	585.6
CXR-PIOWPJ-04-04-28	120	1.6	49.4	726.6
CXR-PIOWPJ-04-04-29	150	1.6	54.6	866.0
CXR-PIOWPJ-04-04-30	185	1.6	60.0	1040.7
CXR-PIOWPJ-04-04-31	240	1.6	66.2	1303.2
CXR-PIOWPJ-04-04-32	300	1.6	72.1	1585.3