

2 X 800 MW (PH-II) MAHAN TPP

2 X 800 MW RAIGARH (PH-II) TPP

***TECHNICAL SPECIFICATION FOR
SCREENED CONTROL CABLE***

BHEL DOCUMENT NO. : PE-TS-504/513-507-E004, REV-00



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA – 201301**

411356/2024/PS-PEM-EL

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR SCREENED CONTROL CABLES	SPECIFICATION NO. PE-TS-504-507-E004	
		VOLUME II	
		SECTION -	
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TOTAL NO. OF SHEETS = **25**
(INCLUDING COVER/SEPARATOR SHEETS)

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COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same
2. There are no deviation with respect to specification.
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in BOQ-Cum-Price schedule of the specification shall not be considered (i.e., technical description & quantities as per specification shall prevail).

BIDDER'S STAMP & SIGNATURE

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DOCUMENT TITLE

**TECHNICAL SPECIFICATION FOR
SCREENED CONTROL CABLES**

SPECIFICATION NO. PE-TS- 504-507-E004

VOLUME II

SECTION I

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SECTION – I**SPECIFIC TECHNICAL REQUIREMENTS**

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1.0 SCOPE

- 1.1 Design, Manufacture, Inspection and testing at manufacture's works, proper packing and delivery to site of **Screened Control cables** conforming to this specification.
- 1.2 General technical requirements of the Screened Control cables are indicated in Section-II. Project specific technical/ quality requirements / changes are listed in Section-I.
- 1.3 The stipulations of Section-I, followed by those of Data Sheet-A shall prevail in case of any conflict between the stipulations of Section-I, Data Sheet - A & Section-II.

2.0 BILL OF QUANTITIES:

- 2.1 Quantity requirements shall be as per BOQ-cum-price schedule enclosed in NIT.

3.0 SPECIFIC TECHNICAL REQUIREMENTS

3.1 Technical:

<u>S.No.</u>	<u>Reference Clause No. of Section- II (if any)</u>	<u>Specific Requirement/ Change</u>

3.2 Quality/ Inspection:

<u>S.No.</u>	<u>Reference Clause No. of Section- II (if any)</u>	<u>Specific Requirement/ Change</u>

4.0 DRAWINGS & DOCUMENTS TO BE SUBMITTED

4.1 Along with technical offer :

Sl. No.	DOCUMENT TITLE
1	PQR CREDENTIALS
2	COMPLIANCE SHEET

4.2 After award of contract :

Sl. No.	BHEL Drawing No.	Drawing Title	Vendor submission (Days)*	BHEL Comment (Days)	Vendor submission (Days)#	BHEL & Customer comment/ approval (Days)
1	PE-V0-504-507-E141	DATA SHEET & CROSS SECTION DRAWINGS FOR SCREEN CONTROL CABLE	7	3	2	18
2	PE-V0-504-507-E916	QAP FOR SCREEN CONTROL CABLE	7	3	2	18
3	PE-V0-504-507-E144	TYPE TEST REPORT FOR SCREEN CONTROL CABLE	7	3	2	18

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NOTES:

- a) * 1st submission within indicated days from date of purchase order.
b) # Submission (within indicated days) after incorporating all BHEL comments.

**DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT
DOCUMENT**

SI. No.	DOCUMENT TITLE
1	APPROVED TECHNICAL DATASHEET & GA DRAWING.
2	APPROVED QUALITY PLAN.
3	ALL TEST CERTIFICATES

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR SCREENED CONTROL CABLES	SPECIFICATION NO. PE-TS-504-507-E004	
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DATA SHEET-A
SPECIFIC TECHNICAL REQUIREMENTS

1.0 Type of cable : FRLS SCREENED CONTROL CABLES

2.0 Standards Applicable :

S. No.	STANDARD	APPLICATION
1	IS-1554-I	General Construction & tests for cables.
2	IS-694	For insulation thickness.
3	SEN-SS-424-1475, IEC-60332 Part 1, IEEE 383	Flammability Tests
4	ASTMD-2843, ASTMD-2863, IEC-754 Part-1	FRLS Tests

3.0 Voltage grade : 1.1 kV

4.0 CONDUCTOR

a) Material : High conductivity multi stranded
annealed tinned electrolytic Copper

b) Minimum number of strands:
(dia. of each strand),
cross sectional area : 7 (0.307 mm.), 0.5 sq. mm.

5.0 INSULATION

a) Material : HR PVC Type C (as per IS-5831,1984)

b) Application : Extruded

c) Insulation thickness : 0.6 mm (nominal) as per IS-694

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c) Volume resistivity (Min.) : i. 1×10^{13} Ohm-cm at 27°C/ room temp.

ii. 1×10^{10} Ohm-cm at 85°C

6.0 PAIRING & TWISTING

a) Min. number of twist per Metre for paired cables. : 20 (for 0.5 sq mm)

b) Maximum lay of individual twisted pair : Pair twisted with lay of 60 mm (max)

c) Core identification : Twisting Direction : All pairs in the same direction.
Lapped to form bunch with mylar tape.

d) Single Layer of Binder Tape on each pair is provided : YES

e) Unit Formation of four pair polyester binder tape for cables more than 4P is provided : YES

7.0 IDENTIFICATION OF CORES : Band marking

8.0 INDIVIDUALLY SCREENED (F type)

a) Material : Aluminium-Mylar tape

b) Coverage : 100%

c) Overlap : Minimum 25%

d) Min. thickness (Micron): 28 micron

e) Binder : Polyester tape

9.0 OVERALL SCREENED (G type)

a) Material : Aluminium-Mylar tape

b) Coverage : 100%

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c) Over lap : Minimum 25%

d) Min. thickness (Micron) : 60 micron

e) Binder : Polyester tape

10.0 DRAIN WIRE

To be provided separately for individual pair shield (wherever applicable) and overall shield.

a) Material : Annealed tinned copper conductor

b) Minimum number of strands: 7 (0.307 mm.), 0.5 sq. mm.
(dia. of each strand),
cross sectional area

11.0 BEDDING

a) Material : Mylar tape.

12.0 INNER SHEATH

a) Material : Extruded HR PVC Type ST2 as per IS-5831 & IS-1554 Part-I

b) Thickness (min) : 0.3 mm

b) Whether FRLS : YES

c) Fillers : Acceptable

d) Material of fillers : Same as inner sheath (With moisture resistant / non - hygroscopic properties)

e) Method of application : Pressure / Vacuum Extrusion

f) Inner sheath Thickness: As per IS-1554 Part-1

g) Colour : Black

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- 13.0 RIP CORD : Non-metallic cord under inner sheath
- 14.0 FILLERS
- a) Fillers : Acceptable, only if Flame Retardant & Moisture Resistant (Non-hygroscopic).
- 15.0 ARMOURING
- a) Material : Galvanized steel round wire/ formed wire as per IS-3975 & IS-1554 Part-I
- b) Minimum coverage : 90%
- c) Breaking load of joints : 95% of normal armour
- d) Method of jointing : Welding
- 16.0 OUTER SHEATH
- a) Material : Extruded FRLS PVC (anti rodent, anti termite & moisture resistant properties)
- b) Thickness : As per IS-1554 Part-1 1976
- c) Minimum & Nominal Thickness at any point : 1.24 mm and >1.24 mm respectively, as per IS-1554-I
- c) Application : Extruded
- d) Colour : Black/ Grey for Overall screened cable (G type) & Light blue/ Black/ Grey for Individual & overall screened cable (F type)
- e) Whether FRLS : YES
- f) Other : Resistant to water, Fungus, Termite & rodent attack
- g) Fillers : Non hygroscopic with FRLS property
- h) Material of fillers : Same as inner sheath (With moisture resistant properties & Flame retardant – as applicable)

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17.0 FRLS/ FLAMMABILITY TESTS

- a) Oxygen Index : 29% Minimum as per ASTMD 2863
- b) Temperature Index : 250 °C Minimum as per ASTMD 2863
- c) Acid gas generation : less than 20% by weight (As per IEC-754-1)
- d) Smoke density rating : Not more than 60% (As per ASTMD 2843) Defined as average area under curve when the results of smoke density plotted on a curve indicating light absorption v/s time as ASTMD 2843
- e) Flammability Test : As per IEC-60332-1, IEEE-383
- f) Swedish Chimney test : As SEN-SS-424-1475 Class F3

18.0 Rodent & Termite Test : Few chippings of PVC compound are slowly ignited in a porcelain dish in a muffle furnace at about 600 deg. C. The resulting ignited ash is boiled with a little ammonium acetate solution (10%). A drop of aqueous sodium sulphide solution is placed on a thick filter paper and it is allowed to soak. The spot is touched with a drop of above extract. A black spot indicates the presence of anti-termite & rodent compound (lead).

19.0 TOLERANCE ON OVERALL DIAMETER : $\pm 2\text{mm}$ max. over the declared value in Technical Data Sheet

20.0 VARIATION IN DIA : Not more than 1 mm throughout the length of cable

21.0 (i) DRUM MATERIAL : Non-returnable wooden drum or steel drum

(ii) DRUM LENGTH

a) Standard drum length : 1000 mtr upto & including 12 Pairs; 500 mts above 12 pairs
For each individual cable size, one short length of not less than 250m may be accepted only in the final drum length to complete the supply

b) Tolerance on drum length : $\pm 5\%$

c) Outermost layer : To be covered with waterproof polyethylene

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22.0 MARKING ON OUTER SHEATH

- a) Progressive sequential Length marking : Yes @ 1 m by printing/ embossing
- b) Progressive marking @ 5 m : Manufacturer's name or trade make, year of manufacture, cable code, type of cable & voltage class, nominal cross section area of conductor & no. of cores, progressive sequential length marking, drum number MEL & BHEL-PEM by Embossing / Printing.

23.0 TECHNICAL PARAMETERS (C & I) As per Table below

STANDARD CABLE PARAMETERS FOR INSTRUMENTATION CABLE

Parameter	0.5 mm ² (IS & OS) type-F	0.5 mm ² (OS) type-G
Mutual Capacitance (max.) at 1 kHz, nF/Km	120	100
Conductor Loop Resistance (max.), Ohm/Km	78 (tinned)	78 (tinned)
Insulation Resistance (min), M Ohm/ Km	100	100
Cross Talk attenuation (min) at 1 kHz, dB/Km	60	60
Characteristic impedance (max.) at 1 kHz	320	340
Attenuation (max.) at 1 KHz, db/100m	1.2	1.2

Note:

1. Cable parameters indicated above are at 20 degC (+/- 3 degC)

24.0 Test voltage & duration

- (a) High Voltage Tests
- (i) Core to core : 1.5 KV for 1 minute
- (ii) Core to screen : 1 KV for 1 minute

25.0 All cables shall be provided with anti termite, anti Rodent, anti-fungal & moisture resistant properties.

26.0 Repaired cables shall not be acceptable. Brand new cables manufactured for subject plant shall be acceptable only.

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ANNEXURE: B-I

**CORE IDENTIFICATION / PAIR
IDENTIFICATION**



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ANNEXURE: B-I

The wires of pairs shall be coded by base colours on insulation which are repeated in every unit. Base colours of the pairs in a unit shall be as follows:

PAIR	CORE	COLOUR
1 st	1 st	Blue
1 st	2 nd	Red
2 nd	1 st	Grey
2 nd	2 nd	Yellow
3 rd	1 st	Green
3 rd	2 nd	Brown
4 th	1 st	White
4 th	2 nd	Black

Each four pair is laid to form one unit and wound with Mylar tape. The cores of each unit shall then be identified by colour bands for cables of more than 4-pair. e.g. All eight cores of the first unit shall have a single band of pink colour.

Unit	Ring Colour	Ring Group
1	PINK	I
2	PINK	II
3	PINK	III
4	PINK	IIII
5	ORANGE	IIIII
6	ORANGE	IIIIII
7	ORANGE	IIIIIII
8	ORANGE	IIIIIIII

The vertical lines under column (Ring Group) in the above table indicate number of rings at intervals of approx. 60 mm length of the wires of the units. For cables above 4 pair, each 4 pair units shall be open helically lapped with numbered binder taped for the purpose of binding & unit identification.



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DATA SHEET-C

S.No.	Particulars	Unit	Description
1	Manufacturer's name	-	
2	Reference design standards	-	
3	Conductor size	sq. mm	
4	Rated Voltage	V	
5	Number of pairs	No.	
6	Cable suitable for both earthed & unearthed system	-	
7	Conductor		
	a) Material	-	
	b) Reference Standard	-	
	c) Grade	-	
	d) No. of strands	No.	
	e) Diameter of strands (nom.)	mm	
	f) Approx. dia of conductor	mm	
	g) Cross Section area	sq. mm	
8	Insulation		
	a) Reference Standard	-	
	b) Material composition	-	
	c) Application	-	
	d) Minimum thickness	mm	
	e) Nom.Thickness	mm	
	f) Max. thickness	mm	
	g) Minimum volume resistivity as per IS 5831	Ohm cm	
	h) Dielectric constant	-	
	i) Maximum conductor temperature withstand capacity	°C	
	j) Core diameter including insulation	mm	
9	Core laying		
	a) Whether cores are twisted.	-	
	b) Maximum lay of twist	mm	
	c) Identification of cores	-	
10	Individual Shield		
	a) Material	-	



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	b) Thickness of tape	micron	
	c) Coverage/ Overlap	%	
	d) Noise interference better than	dB	
11	Drain wire for individual shield		
	a) Reference standard	-	
	b) Size (No. of strands/ dia. of each strand)	sq. mm (no./mm)	
	c) Material	-	
	d) Resistance of drain wire per km at 20 deg.C	ohm	
12	Overall shield		
	a) Material	-	
	b) Thickness of tape	mm	
	c) Coverage/Overlap	%	
	d) Noise interference better than	dB	
13	Drain wire for overall shield		
	a) Reference standard	-	
	b) Size/ No.of strands	sq. mm/ no.	
	c) Material	-	
	d) Resistance per Km (with shield) at 20°C	Ohm/ km	
14	a) Fillers: Material (if applicable)		
	b) Bedding Material		
15	Inner sheath		
	a) Material, type and standard	-	
	b) Whether FRLS	-	
	c) Colour	-	
	d) Method of application	-	
	e) Thickness (min)	mm	
16	Armour		
	a) Material,	-	
	b) Formed wire / round wire		
	c) Minimum Coverage	%	
	d) Method of jointing	-	
	e) Breaking load of joint	-	
	f) Size (approx.)	mm	
	g) Dia of armour	mm	
	h) No. of wires	mm	
17	Outer sheath		
	a) Reference standard	-	
	b) Material	-	
	c) Minimum thickness of sheath	mm	
	d) Calculated dia under outersheath	mm	
	e) Oxygen index (as per ASTM D 2863)	-	



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	f) Temperature index (in deg. C as per ASTM D 2863)	-	
	g) Maximum acid gas generation as per IEC 754-1	%	
	h) Maximum smoke density rating as per ASTM D 2843	%	
	i) Colour of outer sheath	-	
18	Dia over laid-up core	mm	
19	Dia under armour	mm	
20	Dia above armour	mm	
21	Overall diameter of cable	mm	
22	Tolerance on overall diameter	mm	
23	Weight of		
	Copper (conductor & drain wire)	MT. / km	
	PVC (insulation, sheath & fillers)	MT. / km	
	Armour	MT. / km	
	Cable (approx.)	MT. / km	
24	Cable parameters at 20°C (+/-3 deg. C)		
	a) Conductor resistance (max)	Ohm/ km	
	b) Insulation resistance (min)	M-Ohm	
	c) Mutual capacitance at 0.8KHz (max)	nF/ km	
	d) Cross talk at 0.8KHz (min)	dB	
	e) Attenuation at 1 KHz (max)	dB/ km	
	f) Characteristic impedance at 1 KHz (max)	Ohm	
25	Continuous operating temp. (deg.C)	deg. C	
26	(a) Relevant IS standard including Part & category for Flame retardance of complete cable	-	
	(b) Relevant IEC standard including Part & category for Flammability of complete cable		
27	Whether complete cable passes Swedish Chimney test as per SEN 4241475 (F3)	-	
28	Identification		
	a) Length of cable marked at every mtr.	-	
	b) FRLS marked at every 5 mtrs	-	
	c) Each core of the pair numbered	-	
	d) Conductor identification details for pairs	-	
	e) Details of cable markings	-	
29	Test voltage		
	a) High voltage test/ Dielectric Strength		
	i) Voltage (KV), Core - Core	kV	
	ii) Duration	min	
	b) High Voltage test		
	i) Voltage (KV), Core - Screen	V	
	ii) Duration	min	



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	c) Resistance to direct current test (applicable for 225 V cable as per VDE)	-	
	Voltage	V	
	Duration	hrs/days	
30	Min bending radius	mm	
31	Ovality at any cross section	mm	
32	Variation of dia through out cable length		
33	Cable cross-sectional drawings for each type of cable furnished		
34	i) Length of single coil in a drum	M	
	ii) Marking on drum	-	
	iii) Seasoned wood drum provided	-	
	iv) Both ends of cable to be sealed with PVC/ Rubber caps to prevent water/ moisture ingress		
	v) Gross weight (approx.)	kg.	
	vi) Net weight (approx.)	kg	
35	Type test procedures as per BHEL Technical Spec. and other relevant standards enclosed.		
36	Anti termite & rodent test		

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SECTION-‘II’**GENERAL TECHNICAL SPECIFICATION**

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1.0 TECHNICAL REQUIREMENTS

- 1.1 Technical requirements for SCREENED CONTROL CABLES shall be as indicated in this section, in addition to those specified in Datasheet-A.
- 1.2 It is not the intent to specify herein all the details of design & manufacture. However, the equipment shall conform in all respects to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation at site conditions.

2.0 CODES & STANDARDS

- 2.1 The design, material, construction, manufacture, inspection and testing of Screened control cables shall conform to the latest revision of relevant standards and codes of practices mentioned in Data Sheet - A.
- 2.2 In case of conflict between the applicable reference standard and this specification, this specification shall govern.

3.0 QUALITY ASSURANCE REQUIREMENTS

- 3.1 Bidder shall confirm compliance with the BHEL Standard Quality Plan (PE-QP-999-507-E004) as attached with the specification without any deviations. At contract stage, the successful bidder shall submit the same QP for BHEL/ ultimate customer's approval. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ultimate customer's approval. There shall be no commercial implication to BHEL on account of minor changes in QP during contract stage.
- 3.2 All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved Quality Plan.
- 3.3 Type testing requirements, routine/ acceptance testing and special testing requirements shall be as per Annexure to QP. Charges for all these tests for all the equipments & components shall be deemed to be included in the bid price (except UV Radiation & Hydraulic Stability test).
- 3.4 The charges of UV Radiation test & Hydrolytic Stability test (if applicable) shall be reimbursed extra at actual against original money receipt of Govt. Lab. (CPRI/ ERDA etc).
- 3.5 Cost of cables consumed for testing shall be to bidder's account.
- 3.6 Type Test Reports for Tests conducted shall be submitted for BHEL's/ Customer's review/approval.

4.0 Packing

- 4.1 Cables shall be supplied in non-returnable drums. Material of cable drum shall be as specified in Datasheet-A.
- 4.2 In case of wooden drums, all wooden parts shall be manufactured from seasoned wood treated with copper naphthenates/ zinc naphthenates (refer IS: 401). Dimensions of wooden drums shall be as per IS 10418. All ferrous parts shall be treated with suitable rust protective finish or coating to avoid rusting during transit and storage. BIS certification mark shall be stamped on each cable drum. Over the cables polyethylene sheet shall be wrapped and then sealed properly.
- 4.3 In case of Steel drums, new or practically new cable drums made of steel and painted with epoxy resin paint are to be used. Cable ends are carefully protected before packing. Over the cables polyethylene sheet shall be wrapped and then sealed properly.

		STANDARD QUALITY PLAN									Approved by QA				
		ITEM : LT PVC INSULATED INSTRUMENTATION CABLE					SQP NO: ADANI/QA/SQP/E/008 REV. NO.:01 DATE: 01.04.2015 PAGE: 1 of 5								
SL No.	COMPONENT/ OPERATION	CHARACTERISTICS	CATEGO RY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS	
					M	C/A					M	C	A		
1	2	3	4	5	6		7	8	9	*D	**10			11	
1. Raw Material															
1.1	Copper Rod	Surface	Major	Visual	Each Coil	Each Coil	Conductor shall be smooth	Conductor shall be smooth	MTC	√	P	V	V		
		Chemical Composition	Major	Chemical	IS: 613-Cu	IS: 613-Cu	IS: 613-Cu	IS: 613-Cu		√	P	V	V		
		Resistivity / Conductivity	Critical	Electrical						√	P	V	V		
		Tensile strength	Major	Physical						√	P	V	V		
		Elongation at break	Major	Physical						√	P	V	V		
		Diameter	Major	Dimensional						√	P	V	V		
1.2	PVC Compound	Density	Major	Measurement	1 sample from a lot of 2 MT or part there of each Lot	1 sample from a lot of 2 MT or part there of each Lot	IS: 5831	IS: 5831	MTC	√	P	V	V		
		Thermal stability	Major	Thermal			IS: 5831			√	P	V	V		
		Tensile strength	Major	Physical			IS:10810			√	P	V	V		
		Elongation at break	Major	Physical			IS:10810			√	P	V	V		
		Volume resistivity	Major	Electrical			IS:10810-P 60			√	P	V	V		
		Anti Termite & Rodent	Critical	Thermal			Presence of Lead			Presence of Lead	√	P	V		V
		Tests for FRLS (For FRLS Cable only)													
		Smoke density	Critical	Optical	1 sample from a lot of 2 MT or part there of each Lot	1 sample from a lot of 2 MT or part there of each Lot	ASTMD-2843	Max 60%	MTC	√	P	V	V		
		Oxygen index	Critical	Thermal			ASTMD-2863	Min. 29%		√	P	V	V		
		Temperature index	Critical	Thermal			ASTMD-2863	Min 250°C		√	P	V	V		
		HCL Test	Critical	Chemical			IS 10810/ IEC-754-1	Max 20% by Weight		√	P	V	V		
		1.3	Al-Mylar Tape	Width	Minor	Measrt.	One sample /Lot	One sample /Lot	Data Sheet	Data Sheet	MTC	√	P	V	V
Thickness	Major			Measrt.	Data Sheet	Data Sheet			√	P		V	V		
1.4	GI Armour Flat / Wire	Dimensions	Major	Dimensional	IS 3975	IS 3975	IS:3975	IS:3975	MTC	√	P	V	V		
		Tensile strength	Major	Mechanical						√	P	V	V		
		Elongation at Break	Major	Mechanical						√	P	V	V		
		Resistivity	Minor	Electrical						√	P	V	V		
		Torsion Test (For Round Wire Only)	Major	Mechanical						√	P	V	V		
		Wrapping Test	Major	Mechanical						√	P	V	V		
		Adhesion Test	Major	Chemical						√	P	V	V		
		Mass of zinc Coating	Major	Chemical						√	P	V	V		
		Uniformity of Zinc	Major	Chemical	IS:4826	IS:4826	√	P	V	V					
					IS 2633	IS 2633	√	P	V	V					

		STANDARD QUALITY PLAN									Approved by QA			
		ITEM : LT PVC INSULATED INSTRUMENTATION CABLE					SQP NO: ADANI/QA/SQP/E/008 REV. NO.:01 DATE: 01.04.2015 PAGE: 2 of 5							
SL No.	COMPONENT/ OPERATION						CHARACTERISTICS	CATEGO RY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK				
		M	C/A			M				C	A			
1	2	3	4	5	6		7	8	9	*D	**10			11
1.5	Wooden Drums	Dimensions of drum	Major	Dimensional	20%	One sample / size / lot	IS:10418	IS:10418	MTC/ITR		P	V	V	
		Thickness of flange	Major	Dimensional			IS:10418	IS:10418			P	V	V	
		Number of tie rods	Major	Count			IS:10418	IS:10418			P	V	V	
		Size of tie rods	Major	Dimensional			IS:10418	IS:10418			P	V	V	
		Diameter of centre hole	Minor	Dimensional			IS:10418	IS:10418			P	V	V	
		Visual	Major	Visual			IS:10418	IS:10418			P	V	V	
2. IN PROCESS														
2.1	Wire drawing	Surface finish	Major	Visual	100%	10%	IS:8130	IS:8130	MTC/ITR		P	V	V	
		Diameter	Minor	Dimensional	Each setting & one sample per Lot	Each setting & one sample per Lot	Data Sheet	Data Sheet			P	V	V	
		Tensile strength	Major	Mechanical			IS:10810Pt 2	IS:8130			P	V	V	
		Annealing Test	Major	Mechanical			IS: 10810 Pt 1	IS:8130			P	V	V	
		Resistivity/Conductivity	Critical	Electrical			IS:10810Pt 5	IS:5484			P	V	V	
2.2	Stranding	No. of wires	Major	Count	Each setting & Twice in shift	Each setting & Twice in shift	Mfg Plant Std/ Data Sheet/ IS: 8130	Mfg Plant Std/ Data Sheet/ IS: 8130	ITR		P	V	V	
		Wire diameter	Minor	Dimensional							P	V	V	
		Lay Direction	Major	Visual							P	V	V	
		Cond. Dia/height	Major	Dimensional							P	V	V	
		Cond. Resistance	Critical	Electrical							P	V	V	
		Surface	Major	Visual							P	V	V	
2.3	Insulation	Type of compound	Major	Visual	Each setting & Twice in shift	Each setting & Twice in shift	Mfg Plant Std / Data Sheet/ BS:5308	Mfg Plant Std / Data Sheet/ BS:5308	ITR		P	V	V	
		Insulation thickness	Major	Dimensional							P	V	V	
		Surface finish	Major	Visual							P	V	V	
		Colour/Core Identification	Major	Visual							P	V	V	
		Porostiy	Major	Visual	100%	100%					P	V	V	
		Spark Test	Major	Electrical							P	V	V	
		Continuity of Conductor	Major	Visual							P	V	V	
2.4	Pairing / Laying	Lay Length / No.of Twists per Metre	Major	Measrt.	Each setting & Twice in shift	Each setting & Twice in shift	Mfg Plant Std / Data Sheet/ BS:5308	Mfg Plant Std / Data Sheet/ BS:5308	ITR		P	V	V	
		Core / Pair Sequence	Major	Visual							P	V	V	
2.5	Pair / Overall Shielding	Al-Mylar Tape Thickness	Major	Measrt.	Each setting & Twice in shift	Each setting & Twice in shift	Mfg Plant Std / Data Sheet/ BS:5308	Mfg Plant Std / Data Sheet/ BS:5308	ITR		P	V	V	
		Overlap & Coverage	Major	Measrt.							P	V	V	
		Drain Wire Details	Major	Measrt.							P	V	V	
		Diameter over Laid up	Minor	Measrt.							P	V	V	

adani		STANDARD QUALITY PLAN								Approved by QA				
		ITEM : LT PVC INSULATED INSTRUMENTATION CABLE				SQP NO: ADANI/QA/SQP/E/008 REV. NO.:01 DATE: 01.04.2015 PAGE: 3 of 5								
SL No.	COMPONENT/ OPERATION	CHARACTERISTICS	CATEGO RY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS
					M	C/A					M	C	A	
1	2	3	4	5	6		7	8	9	*D	**10			11
2.6	Laying up	Sequence of cores	Major	Visual	Each setting & Twice in a Shift	Each setting & Twice in a Shift	Mfg Plant Std/ Data Sheet/ BS: 5308	Mfg Plant Std/ Data Sheet/ BS: 5308	ITR		P	V	V	
		Lay Length & Direction of lay	Major	Visual							P	V	V	
		Laid up diameter	Major	Dimensional							P	V	V	
		Circularity	Major	Visual							P	V	V	
2.7	Inner sheath	Type of compound	Major	Visual	Each setting & at the end of Each Drum Length	Each setting & at the end of Each Drum Length	Mfg Plant Std/ Data Sheet/ BS: 5308	Mfg Plant Std/ Data Sheet/ BS: 5308	ITR		P	V	V	
		Sheath thickness	Major	Dimensional							P	V	V	
		Surface finish	Major	Visual							P	V	V	
		Dia over sheath	Major	Dimensional							P	V	V	
2.8	Armour	No. of wires	Major	Count	Each setting & at the end of Each Drum Length	Each setting & at the end of Each Drum Length	Mfg Plant Std/ Data Sheet/ IS 3975/IS:1554	Mfg Plant Std/ Data Sheet/ IS 3975/IS:1554	ITR		P	V	V	
		Dimensions of wire	Major	Dimensional							P	V	V	
		Lay direction	Major	Visual							P	V	V	
		Dia over armour	Major	Dimensional							P	V	V	
2.9	Outer sheath	Type of compound	Major	Visual	Each setting & Twice in a Shift	Each setting & Twice in a Shift	Mfg Plant Std/ Data Sheet/ BS: 5308	Mfg Plant Std/ Data Sheet/ BS: 5308	ITR		P	V	V	
		Sheath thickness	Major	Dimensional							P	V	V	
		Surface finish	Major	Visual							P	V	V	
		Dia over sheath	Major	Dimensional							P	V	V	
		TS & Elongation	Major	Dimensional							P	V	V	
		Embossing/Printing/ Seq. Marking	Major	Visual							P	V	V	
3. Finished Cable														
3.1	Routine test	High Voltage test	Critical	Electrical	100%	100%	BS 5308 - II	Withstood	IR	√	P	V	V	NOTE 1: Type Test Certificate not earlier than five Years from the date of award duly reviewed & accepted by Owners Engineering for similar type, Size & rating of cable shall be submitted alongwith inspection call.
		Conductor resistance test	Critical	Electrical			BS: 5308-II	IS:8130		√	P	V	V	
		Drain Wire Resistance	Critical	Electrical			IS:10810 Pt5	IS:8130		√	P	V	V	
3.2	Acceptance test	High Voltage test	Critical	Electrical	Sampling as per IS 1554-I	Sampling as per IS 1554-I	BS 5308 - II	BS 5308 - II	IR	√	P	H	H	
		Conductor resistance test	Critical	Electrical			BS 5308-II	BS 5308-II / Data Sheet		√	P	H	H	
		Drain Wire Resistance	Critical	Electrical			IS:10810 Pt5	IS:8130 / Data Sheet		√	P	H	H	

adani		STANDARD QUALITY PLAN								Approved by QA				
		ITEM : LT PVC INSULATED INSTRUMENTATION CABLE				SQP NO: ADANI/QA/SQP/E/008 REV. NO.:01 DATE: 01.04.2015 PAGE: 4 of 5								
SL No.	COMPONENT/ OPERATION	CHARACTERISTICS	CATEGO RY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS
					M	C/A					M	C	A	
1	2	3	4	5	6		7	8	9	*D	**10			11
3.2	Acceptance test	Mutual Capacitance	Major	Electrical	Sampling as per IS 1554-I	Sampling as per IS 1554-I	BS 5308 - II	Data Sheet/ BS 5308 - II	IR	√	P	H	H	In case the type test is specially required as per the technical specification/PO, same shall be witnessed.
		Capacitance between Core-Shield	Major	Electrical						√	P	H	H	
		Inductance	Major	Electrical						√	P	H	H	
		L/R Ratio	Major	Electrical						√	P	H	H	
		Core Identification & Sequence of Cable	Major	Physical			√	P		H	H	NOTE 2: Dimensional verification shall includes: a) Over all Dia. Of Cable. b) No. of Conductor & Armour c)Dim.Conductor/Armou r d) Size of Cu. Screen & Overlapping.		
		Dimension of Maylar Tap	Major	Physical			√	P		H	H			
		Volume resistivity	Critical	Electrical			√	P		H	H			
		Thickness of insulation	Major	Dimensional			√	P		H	H			
		Thickness of inner sheath	Major	Dimensional			√	P		H	H	NOTE 3: Rewinding of Cable Drum shall be carried out to check the following: a) Sequential Marking on outer sheath of cable as per IS/ Data Sheet b) Total Length Verification. c) Surface Defect 3.2 Different cable size drum shall be selected for rewinding.		
		Thickness of outer sheath	Major	Dimensional			√	P		H	H			
		TS of Insulation	Major	Physical			√	P		H	H			
		Elongation at break of insulation	Major	Physical			√	P		H	H			
		TS of Outer Sheath	Major	Physical			√	P		H	H			
		Elongation at break of outer sheath	Major	Physical			√	P		H	H			
		Core Identification & Sequence of Cable	Major	Physical			√	P		H	H			
		Dimensional Verification (Note 2)	Major	Measurement			√	P		H	H			
		Rewinding of Drum (Note 3)	Major	Visual	10% of Lot offered for inspection	10% of Lot offered for inspection	Data Sheet and Declared Length	Data Sheet and Declared Length		√	P		H	H
		Cable Identification (Note 4)	Critical	Visual			Data Sheet	Data Sheet		√	P		H	H

		STANDARD QUALITY PLAN										Approved by QA			
		ITEM : LT PVC INSULATED INSTRUMENTATION CABLE					SQP NO: ADANI/QA/SQP/E/008 REV. NO.:01 DATE: 01.04.2015 PAGE: 5 of 5								
SL No.	COMPONENT/ OPERATION	CHARACTERISTICS	CATEGO RY OF CHECK	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		INSPECTION AGENCY			REMARKS	
					M	C/A					M	C	A		
1	2	3	4	5	6		7	8	9	*D	**10			11	
3.2	Acceptance test	Anti Termite & Rodent	Critical	Thermal	01 Sample/ Size/ Lot	01 Sample/ Size/ Lot	Presence of Lead	Presence of Lead		√	P	H	H	NOTE 4: Cable Identification for outersheath marking shall be done as per approved datasheet NOTE 5: For FRLS Tests 01 Sample/Lot shall be consider only after tracebility of FRLS material Lot, i.e. outer sheath is made from same batch of FRLS material. Same shall be verified at the time of inspection.	
		Tests for FRLS (For FRLS Cable only)													
		Smoke density	Critical	Optical	01 Sample /Size/Lot offered for inspection (Note 5)	01 Sample /Size/Lot offered for inspection (Note 5)	ASTMD-2843	Max. 60%	IR	√	P	H	H		
		Oxygen index	Critical	Thermal			ASTMD-2863	Min. 29%		√	P	H	H		
		Temperature index	Critical	Thermal			ASTMD-2863	Min 250°C		√	P	H	H		
		HCL Test	Critical	Chemical			IS 10810/ IEC-754-1	Max 20% by Wt.		√	P	H	H		
		Flamability Test	Critical	Thermal			IEC-332-1	IEC-332-1		√	P	H	H		

LEGEND:- D* Records identified with tick (√) shall be essentially included by supplier & manufacturer in Quality Documentation package.

** M: Manufacturer / Sub-Supplier, C: Main Supplier , A: **Adani** or their authorized representative.

Use the following term as appropriate in columns 10. **P**: Perform, **V**: verification and **H**: Customer Hold Point to be witnessed and work shall not proceeded till it is witnessed and cleared in writing.

Format of Record: MTC: Manufacturer/Sub-supplier Test Certificate, ITR: Inprocess Test Report/Record, IR: Inspection Report

GENERAL NOTE:-

- Manufacturer should have all the in house testing (Acceptance & Type Test) facilities for LT Cable.

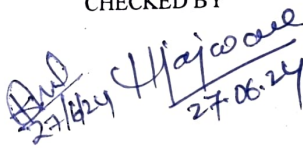
- Testing Instruments used during Inspection must be calibrated from NABL accredited lab only. Instruments used during testing should be within valid calibration date.

	2X800 MW (PH-II) MAHAN TPP 2X800 MW RAIGARH (PH-II) TPP PRE-QUALIFICATION REQUIREMENTS FOR SCREENED CONTROL CABLE	PE-PQ-504/513-507-E016
		REVISION NO. 00 DATE 27/06/2024
		SHEET NO. 1 OF 1

ITEMS : Screened Control Cable	
SCOPE : Supply : YES; Erection & Commissioning : NO	
1.0	Vendor should be a manufacturer of screened/ instrumentation control cables.
2.0	Availability of test reports of tests on FRLS screened control cables to establish in-house Capability to carry out all routine, type acceptance as per relevant IS/ International Standards (except UV radiation & hydrolytic stability Test which can be conducted at Govt. Lab/ Govt. approved Independent lab).
3.0	Capacity of manufacturing 100 km of screened control cables per month.
4.0	Manufactured and supplied at least one (1) km of FRLS cables.
5.0	Manufactured and supplied screened control cables up to 20 pairs.
6.0	Manufactured and supplied at least 400 Km of Screened Control cables in one or more orders and at least 100 Km in one single order.
7.0	Minimum two (2) nos. purchase orders for screened control cables shall be submitted which should not be more than five (5) years old from the date of techno-commercial bid opening for establishing continuity in business.

NOTES (General Points):

1. Consideration of offer shall be subject to customer's approval of bidders, if applicable.
2. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.
3. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities & capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
4. After satisfactory fulfillment of all the above criteria/requirement, offer shall be considered for further evaluation as per NIT & all the other terms of the tender.

PREPARED BY  ANSHIKA DALAL (ENGINEER)	CHECKED BY  KHUSHBU AGRAWAL (SR. MGR) / NN JAJWARE (DGM)	REVIEWED BY  PRAVEEN DUTTA (AGM)	APPROVED BY  DEBASISA RATH (GM-ELECT)
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2X800 MW (PH-II) MAHAN TPP

BOQ-CUM-PRICE SCHEDULE FOR SCREENED CONTROL CABLE

A.0) MAIN SUPPLY

1) Individual & Overall Screened Cable (Type-F)-Armoured cable

Multi pair (twisted) individual & overall shielded instrumentation cables. (Type-F)

S.No.	Item Code	Item Description	UOM	Order Quantity	Drum Length	Unit Price (Ex-Works) in INR	Total Price (Ex-Works) in INR	Freight @ % of total EX-Works Price in INR	GST @ 18% in INR	Total Price Including Freight & GST in INR
(i)	507-31009-A	1.1kV TYPE F(IO) 4P - 0.5 ARMOURED	MTR	97000	1000					
(ii)	507-31013-A	1.1kV TYPE F(IO) 8P - 0.5 ARMOURED	MTR	35000	1000					
(iii)	507-31001-A	1.1kV TYPE F(IO) 12P - 0.5 ARMOURED	MTR	29000	1000					
Grand total				161000						

2) Overall Screened Cable (Type-G)-Armoured cable

Multi pair (twisted) overall shielded instrumentation cables. (Type-G)

S.No.	Item code	Item Description	UOM	Order Quantity	Drum Length	Unit Price (Ex-Works) in INR	Total Price (Ex-Works) in INR	Freight @ % of total EX-Works Price in INR	GST @ 18% in INR	Total Price Including Freight & GST in INR
(i)	507-31025-A	1.1kV TYPE G(O) 2P - 0.5 ARMOURED	MTR	36000	1000					
(ii)	507-31029-A	1.1kV TYPE G(O) 4P - 0.5 ARMOURED	MTR	90000	1000					
(iii)	507-31033-A	1.1kV TYPE G(O) 8P - 0.5 ARMOURED	MTR	164000	1000					
(iv)	507-31017-A	1.1kV TYPE G(O) 12P - 0.5 ARMOURED	MTR	4000	1000					
Grand total				294000						

Notes :

- Quantities indicated above at **S. No. 1 & 2** shall be known as Order Quantities.
- The bidder shall indicate the unit price of each type and size of cables listed as per the BOQ in the Price Schedule. The unit price shall apply for adjustment of variation in quantity as stipulated above.
- Overall tolerance on total dispatched quantity of each size shall be (-) 2% and (+) 0% except where the total ordered quantity is one single drum length of 1000m, in which case it shall be -5%/0%. Cables consumed for testing and inspection shall be to bidder's account.
- Standard drum length shall be 1000 metres upto 12P & Standard drum length shall be 500 metres above 12P. The tolerance of drum length shall be +/- 5%.
- For each individual cable size, one short length of not less than 200m may be accepted only in the final drum length to complete the supply (except where the total ordered quantity is one single drum length of 1000m). The overall tolerance limits stipulated above shall continue to apply (in case short lengths are accepted).
- Test charges are deemed to be included in price of cables. No separate, Test charges to be quoted by bidder.No separate charges shall be payable for tests.



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Cir. No. 05/DIV/CAB/05

31 January 2023

All Members of Cable Division & All SEBs, Utilities & Listed Purchasing organisations

Sub: Revision in Price Variation Formulae for Instrumentation cable

In current applicable PV formulae of IEEMA for Instrumentation Cable effective from July 2014 there is no variation available on polymers which is having significant portion of cost of the cable.

IEEMA Cable technical committee discussed the subject and felt that there is need of revision in the PV clause by inclusion of Polymer factors and pairs up to 61. IEEMA collected the weight factors for Copper, Steel and Polymer for pair and triad instrumentation as per BSEN standard 502887 and prepared draft formulae and circulated to all stakeholders vide Cir. No. 32/DIV/CAB/05 dated 10th November 2022.

Since there are no adverse comments received; we are making these operational from 1st January 2023.

Although, these PV clauses are made effective from 1st January 2023, practically they can be incorporated in all the current new tenders/contracts starting from 1st February 2023.

We request and recommend all the users & stakeholders including Utilities, PSUs etc. to incorporate these new PV formulae in all the new tenders/contracts henceforth.

For pending contracts, for the date of delivery on or after 1st February 2023, to arrive at the final price variation, we recommend using the following two stage method, which is a standard institutionalized methodology adopted by IEEMA for change over in all IEEMA PV clauses.

1. Calculate price variation 'P' from applicable prices/indices as per your base date / date of tendering up to January 2023 i.e. considering all prices/indices published in PV circular of January 2023; using applicable IEEMA PV clause of Instrumentation cable which is effective from July 2014.
2. Treat the above calculated 'P' as 'P₀' and calculate final price variation considering all prices / indices published in PV circular of January 2023 applicable for revised PV clause of Instrumentation cables effective from 1st January 2023 as base prices/indices up to the applicable prices/indices as per the date of delivery; applicable as per revised relevant PV clause of Instrumentation Cables effective from 1st January 2023.

Director

Encl.: as above

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023****Material Price Variation Clause for Instrumentation Cables**

The Price quoted/confirmed is based on the input cost of raw materials/components as on the date of quotation, and the same is deemed to be related to the prices of raw materials as specified in the price variation clause given below. In case of any variation in these prices, the price payable shall be subject to adjustment up or down in accordance with the formulae provided in this document.

Terms used in price variation formulae:

P Price payable as adjusted in accordance with above appropriate formula **(in Rs/Km)**

P₀ Price quoted/confirmed **(in Rs/Km)**

COPPER

CuF Variation factor for copper

Cu Price of CC copper rods. This price is as applicable for the month, ONE month prior to the date of delivery.

Cu₀ Price of CC copper rods. This price is as applicable for the month, ONE month prior to the date of tendering.

STEEL

FeF Variation factor for steel

Fe Price of Steel Strips/steel wire. This price is as applicable for the month, ONE month prior to the date of delivery.

Fe₀ Price of Steel Strips/steel wire. This price is as applicable for the month, ONE month prior to the date of tendering.

POLYMER

POCF Variation factor for polymer

POC Price of PVC/polymer. This price is as applicable for the month, ONE month prior to the date of delivery.

POC₀ Price of PVC/polymer. This price is as applicable for the month, ONE month prior to the date of tendering.

IEEMA(PVC)/Instrumentation Cable/2022/ 1 of 27

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IEEMA (PVC)/Instrumentation Cable/2022

Effective from: 01st January 2023

The above prices and indices are as published by IEEMA vide Circular reference IEEMA(PVC)/CABLE/--/-- for the month i.e. **ONE** month prior to the date of tendering.

The date of delivery is the date on which the instrumentation cable is notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes:

(a) All prices are exclusive of GST amount and exclusive of any other central, state or local taxes etc.

(a) All Prices are applicable for the month.

(b) The details of prices are as under:

1. Price of CC copper rods (in Rs/MT) is ex-works price as quoted by the primary producer.
2. Price of galvanized steel strip / steel wire (in Rs/MT) is ex-works price as quoted by the manufacturer for Round steel Wire and Flat steel strip (the relevant price of steel strip or steel wire is to be selected depending upon the type of armouring of the cable).
3. Price of Polymer Compound (in Rs/MT) is the ex-work price, as quoted by the manufacturer/s
4. Price of PVC (in Rs/MT) is the ex-work price, as quoted by the manufacturer/s

Price variation formula for Instrumentation Cables

$$P = P_0 + CuF (Cu - Cu_0) + FeF (Fe - Fe_0) + POCF (POC - POC_0)$$

Tables References for CuF, FeF and POCF:

For Pair Instrumentation - Over all Screen Cables

Cu POS Copper factor
 Fe POS Steel factor
 POC POS Polymer factor

For Pair Instrumentation - Individual and Over all Screen Cables

Cu PIS Copper factor
 Fe PIS Steel factor
 POC PIS Polymer factor

IEEMA(PVC)/Instrumentation Cable/2022/ 2 of 27



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IEEMA (PVC)/Instrumentation Cable/2022

Effective from: 01st January 2023

For Triad Instrumentation - Over all Screen Cables

Cu TOS	Copper factor
Fe TOS	Steel factor
POC TOS	Polymer factor

For Triad Instrumentation - Individual and Over all Screen Cables

Cu TIS	Copper factor
Fe TIS	Steel factor
POC TIS	Polymer factor

Authorised Signatory

IEEMA(PVC)/Instrumentation Cable/2022/ 3 of 27

IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Copper Factors for Instrumentation Cables - Cu POS					
Pair Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.0142	0.0191	0.0237	0.0330	0.0513
2	0.0236	0.0336	0.0430	0.0615	0.0986
3	0.0330	0.0481	0.0619	0.0897	0.1452
4	0.0424	0.0626	0.0810	0.1182	0.1921
5	0.0518	0.0769	0.0999	0.1464	0.2390
6	0.0614	0.0914	0.1191	0.1748	0.2859
7	0.0708	0.1062	0.1383	0.2035	0.3335
8	0.0805	0.1207	0.1576	0.2320	0.3806
9	0.0899	0.1353	0.1765	0.2605	0.4275
10	0.0992	0.1498	0.1957	0.2890	0.4744
11	0.1089	0.1643	0.2149	0.3174	0.5215
12	0.1183	0.1786	0.2339	0.3456	0.5684
13	0.1277	0.1931	0.2532	0.3741	0.6153
14	0.1371	0.2076	0.2721	0.4026	0.6624
15	0.1462	0.2216	0.2906	0.4300	0.7075
16	0.1559	0.2361	0.3095	0.4583	0.7544
17	0.1653	0.2507	0.3288	0.4867	0.8013
18	0.1746	0.2652	0.3477	0.5152	0.8482
19	0.1845	0.2802	0.3677	0.5446	0.8973
20	0.1939	0.2947	0.3869	0.5731	0.9442
21	0.2033	0.3093	0.4059	0.6016	0.9911
22	0.2130	0.3238	0.4251	0.6300	1.0382
23	0.2224	0.3383	0.4440	0.6585	1.0851
24	0.2318	0.3526	0.4633	0.6867	1.1322
25	0.2412	0.3671	0.4822	0.7152	1.1791
26	0.2508	0.3816	0.5015	0.7437	1.2260
27	0.2597	0.3954	0.5194	0.7704	1.2699
28	0.2691	0.4097	0.5384	0.7986	1.3168
29	0.2785	0.4242	0.5573	0.8271	1.3636
30	0.2879	0.4387	0.5766	0.8553	1.4105

IEEMA(PVC)/Instrumentation Cable/2022/ 4 of 27



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Copper Factors for Instrumentation Cables - Cu POS					
Pair Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.2980	0.4542	0.5970	0.8858	1.4609
32	0.3074	0.4687	0.6160	0.9142	1.5080
33	0.3171	0.4832	0.6352	0.9427	1.5549
34	0.3265	0.4978	0.6542	0.9711	1.6018
35	0.3358	0.5120	0.6734	0.9993	1.6489
36	0.3453	0.5266	0.6924	1.0278	1.6958
37	0.3549	0.5411	0.7116	1.0563	1.7427
38	0.3643	0.5556	0.7305	1.0847	1.7898
39	0.3729	0.5689	0.7480	1.1105	1.8325
40	0.3823	0.5834	0.7670	1.1389	1.8791
41	0.3917	0.5977	0.7862	1.1671	1.9260
42	0.4011	0.6122	0.8052	1.1956	1.9729
43	0.4115	0.6282	0.8262	1.2268	2.0247
44	0.4211	0.6427	0.8454	1.2553	2.0716
45	0.4305	0.6572	0.8643	1.2837	2.1185
46	0.4399	0.6718	0.8835	1.3119	2.1656
47	0.4493	0.6861	0.9025	1.3404	2.2125
48	0.4590	0.7006	0.9217	1.3689	2.2594
49	0.4684	0.7151	0.9407	1.3973	2.3065
50	0.4778	0.7296	0.9599	1.4258	2.3534
51	0.4874	0.7441	0.9791	1.4543	2.4005
52	0.4968	0.7587	0.9981	1.4825	2.4474
53	0.5062	0.7732	1.0173	1.5110	2.4943
54	0.5156	0.7877	1.0363	1.5394	2.5414
55	0.5240	0.8003	1.0530	1.5642	2.5821
56	0.5334	0.8147	1.0720	1.5926	2.6289
57	0.5428	0.8293	1.0912	1.6208	2.6758
58	0.5522	0.8438	1.1102	1.6493	2.7227
59	0.5630	0.8601	1.1319	1.6815	2.7763
60	0.5724	0.8746	1.1511	1.7100	2.8232
61	0.5819	0.8891	1.1700	1.7384	2.8701

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Steel Factors for Instrumentation Cables - Fe POS					
Pair Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1233	0.1319	0.1375	0.1487	0.1739
2	0.1832	0.1944	0.2031	0.2148	0.2477
3	0.1866	0.1993	0.2102	0.2299	0.2733
4	0.2036	0.2188	0.2314	0.2538	0.3347
5	0.2215	0.2411	0.2538	0.2791	0.4395
6	0.2373	0.2583	0.2722	0.3306	0.4795
7	0.2373	0.2583	0.2722	0.3306	0.4795
8	0.2681	0.3210	0.3390	0.4482	0.5427
9	0.3184	0.3434	0.4388	0.4881	0.5884
10	0.3336	0.4333	0.4594	0.5114	0.6118
11	0.3376	0.4398	0.4659	0.5179	0.6183
12	0.3490	0.4511	0.4797	0.5291	0.6894
13	0.4239	0.4678	0.4993	0.5542	0.7153
14	0.4362	0.4678	0.4993	0.5542	1.3096
15	0.4503	0.4968	0.5283	0.5803	1.4666
16	0.4568	0.4968	0.5348	0.5870	1.5058
17	0.4790	0.5164	0.5570	0.6176	0.9134
18	0.4790	0.5229	0.5570	0.6176	0.9134
19	0.4855	0.5229	0.5570	0.6176	0.9134
20	0.5181	0.5609	0.6019	0.7147	0.9760
21	0.5181	0.5609	0.6019	0.7147	0.9855
22	0.5432	0.5889	0.6813	0.8479	1.0403
23	0.5432	0.5889	0.6813	0.8479	1.0403
24	0.5657	0.6608	0.7093	0.8842	1.1638
25	0.5657	0.6608	0.7093	0.8842	1.1638
26	0.5722	0.6740	0.7223	0.9037	1.1833
27	0.5806	0.6871	0.7354	0.9268	1.1996
28	0.5976	0.7075	0.7584	0.9542	1.2487
29	0.5976	0.7075	0.7584	0.9542	1.2487
30	0.5976	0.7075	0.7584	0.9542	1.2487

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Steel Factors for Instrumentation Cables - Fe POS					
Pair Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.6816	0.7409	0.8977	0.9996	1.4648
32	0.6816	0.7409	0.8977	0.9996	1.4648
33	0.6816	0.7409	0.8977	0.9996	1.4648
34	0.7020	0.8710	0.9298	1.0270	1.5216
35	0.7020	0.8710	0.9298	1.0270	1.5216
36	0.7085	0.8775	0.9363	1.0335	1.5281
37	0.7085	0.8775	0.9363	1.0335	1.5281
38	0.7365	0.9006	0.9637	1.1527	1.5857
39	0.7430	0.9071	0.9702	1.1592	1.5924
40	0.7430	0.9071	0.9702	1.1592	1.5924
41	0.8667	0.9482	1.0023	1.2101	1.7887
42	0.8667	0.9547	1.0091	1.2101	1.7887
43	0.8732	0.9547	1.0091	1.2101	1.7952
44	0.9006	0.9822	1.0454	1.2540	1.8537
45	0.9006	0.9822	1.0519	1.2540	1.8537
46	0.9006	0.9887	1.0519	1.2540	1.8602
47	0.9071	0.9887	1.0519	1.2605	1.8602
48	0.9166	1.0028	1.1527	1.3661	1.8922
49	0.9392	1.0208	1.1756	1.4664	1.9433
50	0.9392	1.0275	1.1756	1.4729	1.9433
51	0.9457	1.0322	1.1830	1.4795	2.0691
52	0.9457	1.0322	1.1895	1.4795	2.0691
53	0.9457	1.0322	1.1895	1.4795	2.0756
54	0.9594	1.1369	1.2106	1.5222	2.2459
55	0.9731	1.1485	1.2222	1.5222	2.2794
56	0.9796	1.1485	1.2287	1.5222	2.2859
57	0.9796	1.1485	1.2287	1.5290	2.2859
58	0.9981	1.1877	1.2614	1.5791	2.3308
59	0.9981	1.1877	1.2614	1.5791	2.3376
60	1.0048	1.1877	1.2679	1.5856	2.3376
61	1.0048	1.1877	1.2679	1.5856	2.3376

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Polymer Factors for Instrumentation Cables - POC POS					
Pair Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1073	0.1190	0.1233	0.1364	0.1643
2	0.1769	0.1953	0.2106	0.2312	0.2889
3	0.1793	0.1984	0.2032	0.2378	0.2973
4	0.2042	0.2255	0.2443	0.2752	0.3505
5	0.2341	0.2627	0.2861	0.3158	0.4240
6	0.2653	0.2941	0.3174	0.3753	0.4998
7	0.2595	0.2865	0.3079	0.3627	0.4801
8	0.3001	0.3380	0.3611	0.4188	0.5607
9	0.3312	0.3665	0.4117	0.4739	0.6256
10	0.3663	0.4074	0.4531	0.5212	0.6909
11	0.3686	0.4097	0.4551	0.5227	0.6923
12	0.3781	0.4336	0.4657	0.5307	0.7345
13	0.4030	0.4598	0.4929	0.5811	0.7763
14	0.4127	0.4717	0.5069	0.5979	0.8025
15	0.4571	0.5059	0.5601	0.6380	0.8792
16	0.4701	0.5207	0.5762	0.6575	0.9070
17	0.4964	0.5643	0.6033	0.7089	0.9729
18	0.5095	0.5792	0.6203	0.7298	1.0039
19	0.5090	0.5777	0.6180	0.7257	0.9972
20	0.5469	0.6235	0.6856	0.7822	1.0884
21	0.5554	0.6330	0.6959	0.7939	1.1049
22	0.5887	0.6679	0.7421	0.8704	1.2232
23	0.5966	0.6772	0.7525	0.8823	1.2413
24	0.6391	0.7092	0.7728	0.9293	1.3121
25	0.6473	0.7184	0.7831	0.9412	1.3301
26	0.6591	0.7320	0.7981	0.9582	1.3528
27	0.6624	0.7597	0.8297	0.9897	1.3569
28	0.6889	0.7840	0.8602	1.0276	1.4266
29	0.6986	0.7956	0.8730	1.0428	1.4493
30	0.7068	0.8049	0.8831	1.0548	1.4676

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Polymer Factors for Instrumentation Cables - POC POS					
Pair Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.7560	0.8780	0.9578	1.1024	1.5753
32	0.7697	0.8938	0.9758	1.1240	1.6084
33	0.7779	0.9032	0.9861	1.1361	1.6264
34	0.7987	0.9317	1.0110	1.1942	1.7045
35	0.8091	0.9436	1.0243	1.2102	1.7280
36	0.8262	0.9638	1.0472	1.2375	1.7693
37	0.8229	0.9590	1.0410	1.2289	1.7551
38	0.8727	0.9860	1.1023	1.2989	1.8217
39	0.8829	0.9978	1.1157	1.3145	1.8450
40	0.8940	1.0105	1.1294	1.3312	1.8695
41	0.9316	1.0705	1.1559	1.3625	1.9523
42	0.9508	1.0932	1.1812	1.3931	1.9981
43	0.9612	1.1051	1.1946	1.4088	2.0213
44	0.9826	1.1299	1.2540	1.4754	2.0903
45	0.9928	1.1417	1.2670	1.4911	2.1134
46	0.9940	1.1426	1.2678	1.4908	2.1130
47	1.0045	1.1545	1.2808	1.5065	2.1360
48	1.0393	1.1897	1.3007	1.5488	2.1913
49	1.0763	1.2267	1.3312	1.5929	2.2877
50	1.0865	1.2388	1.3443	1.6085	2.3107
51	1.0948	1.2487	1.3897	1.6248	2.3319
52	1.1058	1.2610	1.4037	1.6412	2.3565
53	1.1160	1.2729	1.4167	1.6566	2.3795
54	1.1474	1.3198	1.4514	1.6900	2.4387
55	1.1556	1.3256	1.4625	1.7421	2.4952
56	1.1713	1.3441	1.4836	1.7674	2.5333
57	1.1815	1.3560	1.4967	1.7829	2.5563
58	1.2046	1.4175	1.5269	1.8573	2.6381
59	1.2150	1.4294	1.5400	1.8727	2.6611
60	1.2290	1.4458	1.5585	1.8950	2.6946
61	1.2281	1.4440	1.5557	1.8907	2.6872

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Copper Factors for Instrumentation Cables - Cu PIS					
Pair Instrumentation Individual and Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.0170	0.0216	0.0267	0.0363	0.0545
2	0.0330	0.0430	0.0524	0.0709	0.1080
3	0.0472	0.0621	0.0759	0.1039	0.1594
4	0.0605	0.0814	0.0997	0.1369	0.2109
5	0.0745	0.1005	0.1235	0.1699	0.2625
6	0.0886	0.1196	0.1473	0.2030	0.3140
7	0.1027	0.1390	0.1713	0.2365	0.3665
8	0.1167	0.1583	0.1951	0.2696	0.4181
9	0.1308	0.1773	0.2188	0.3026	0.4696
10	0.1446	0.1967	0.2426	0.3359	0.5213
11	0.1586	0.2158	0.2665	0.3689	0.5730
12	0.1727	0.2349	0.2902	0.4019	0.6247
13	0.1867	0.2542	0.3140	0.4352	0.6764
14	0.2005	0.2733	0.3378	0.4683	0.7281
15	0.2143	0.2921	0.3610	0.5002	0.7780
16	0.2284	0.3112	0.3846	0.5333	0.8295
17	0.2422	0.3303	0.4084	0.5664	0.8812
18	0.2562	0.3496	0.4322	0.5996	0.9326
19	0.2705	0.3692	0.4567	0.6339	0.9863
20	0.2846	0.3886	0.4808	0.6670	1.0381
21	0.2986	0.4076	0.5045	0.7000	1.0897
22	0.3127	0.4270	0.5283	0.7332	1.1414
23	0.3265	0.4461	0.5521	0.7663	1.1931
24	0.3405	0.4652	0.5758	0.7993	1.2448
25	0.3546	0.4845	0.5996	0.8326	1.2963
26	0.3686	0.5036	0.6235	0.8656	1.3480
27	0.3819	0.5219	0.6460	0.8969	1.3966
28	0.3960	0.5410	0.6697	0.9299	1.4481
29	0.4098	0.5603	0.6935	0.9630	1.4998
30	0.4238	0.5794	0.7173	0.9960	1.5513

IEEMA(PVC)/Instrumentation Cable/2022/ 10 of 27

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Copper Factors for Instrumentation Cables - Cu PIS					
Pair Instrumentation Individual and Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.4387	0.5995	0.7424	1.0313	1.6064
32	0.4525	0.6189	0.7661	1.0644	1.6582
33	0.4665	0.6380	0.7899	1.0974	1.7096
34	0.4805	0.6573	0.8137	1.1306	1.7613
35	0.4946	0.6764	0.8375	1.1637	1.8130
36	0.5084	0.6955	0.8613	1.1967	1.8647
37	0.5225	0.7148	0.8850	1.2300	1.9164
38	0.5365	0.7339	0.9088	1.2630	1.9681
39	0.5496	0.7518	0.9309	1.2936	2.0153
40	0.5636	0.7710	0.9546	1.3266	2.0667
41	0.5777	0.7901	0.9784	1.3596	2.1184
42	0.5915	0.8093	1.0022	1.3927	2.1699
43	0.6065	0.8298	1.0280	1.4284	2.2263
44	0.6206	0.8492	1.0518	1.4617	2.2780
45	0.6344	0.8683	1.0756	1.4947	2.3298
46	0.6484	0.8876	1.0993	1.5277	2.3814
47	0.6625	0.9067	1.1231	1.5610	2.4331
48	0.6766	0.9258	1.1469	1.5941	2.4846
49	0.6905	0.9451	1.1707	1.6271	2.5362
50	0.7044	0.9642	1.1945	1.6604	2.5880
51	0.7185	0.9836	1.2183	1.6935	2.6397
52	0.7325	1.0026	1.2420	1.7265	2.6914
53	0.7465	1.0217	1.2658	1.7597	2.7430
54	0.7603	1.0410	1.2896	1.7928	2.7948
55	0.7731	1.0584	1.3109	1.8223	2.8402
56	0.7872	1.0775	1.3347	1.8553	2.8917
57	0.8013	1.0966	1.3585	1.8884	2.9434
58	0.8151	1.1159	1.3823	1.9214	2.9948
59	0.8303	1.1370	1.4086	1.9584	3.0530
60	0.8444	1.1561	1.4326	1.9915	3.1047
61	0.8585	1.1754	1.4564	2.0245	3.1564

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Steel Factors for Instrumentation Cables - Fe PIS					
Pair Instrumentation Individual and Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1326	0.1381	0.1465	0.1575	0.1824
2	0.1958	0.2059	0.2146	0.2305	0.2619
3	0.2020	0.2159	0.2299	0.2494	0.3248
4	0.2201	0.2385	0.2494	0.2747	0.4298
5	0.2424	0.2594	0.2748	0.3332	0.4763
6	0.2597	0.3083	0.3279	0.4356	0.5097
7	0.2597	0.3083	0.3279	0.4356	0.5097
8	0.3224	0.4083	0.4450	0.4849	0.5823
9	0.4068	0.4497	0.4784	0.5278	0.6805
10	0.4299	0.4643	0.4904	0.5395	0.7919
11	0.4450	0.4795	0.5056	0.5575	0.8173
12	0.4562	0.4907	0.5194	0.5742	0.8447
13	0.4730	0.5100	0.5416	0.6453	0.8768
14	0.4730	0.5100	0.5481	0.6453	0.8833
15	0.5020	0.5390	0.5732	0.6826	0.9351
16	0.5020	0.5455	0.5797	0.6891	0.9416
17	0.5241	0.5735	0.6529	0.8202	0.9874
18	0.5306	0.5735	0.6529	0.8202	0.9874
19	0.5306	0.5735	0.6597	0.8267	0.9939
20	0.5546	0.6643	0.7076	0.8826	1.1405
21	0.5661	0.6690	0.7124	0.8920	1.1479
22	0.6430	0.6996	0.8427	0.9288	1.3591
23	0.6430	0.6996	0.8427	0.9288	1.3591
24	0.6660	0.8207	0.8790	0.9700	1.4233
25	0.6660	0.8207	0.8790	0.9700	1.4233
26	0.6792	0.8337	0.8920	0.9830	1.4428
27	0.6923	0.8521	0.9057	1.0014	1.4642
28	0.8070	0.8795	0.9378	1.1149	1.5144
29	0.8070	0.8795	0.9378	1.1149	1.5144
30	0.8070	0.8795	0.9378	1.1149	1.5144

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Steel Factors for Instrumentation Cables - Fe PIS					
Pair Instrumentation Individual and Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.8521	0.9199	0.9782	1.1673	1.7114
32	0.8521	0.9199	0.9782	1.1673	1.7114
33	0.8521	0.9199	0.9782	1.1673	1.7114
34	0.8795	0.9520	1.0895	1.3672	1.7766
35	0.8795	0.9520	1.0895	1.3737	1.7831
36	0.8795	0.9585	1.0962	1.3737	1.7831
37	0.8860	0.9585	1.0962	1.3737	1.7896
38	0.9134	1.0714	1.1380	1.4230	1.9677
39	0.9134	1.0779	1.1445	1.4230	1.9742
40	0.9199	1.0779	1.1445	1.4295	1.9742
41	0.9520	1.1153	1.1836	1.4863	2.1971
42	0.9520	1.1221	1.1836	1.4863	2.1971
43	0.9520	1.1221	1.1836	1.4928	2.2036
44	1.0719	1.1548	1.3877	1.5430	2.2705
45	1.0719	1.1548	1.3877	1.5495	2.2770
46	1.0719	1.1613	1.3877	1.5495	2.2770
47	1.0784	1.1613	1.3877	1.5495	2.2770
48	1.0826	1.1776	1.4156	1.6981	2.3170
49	1.1111	1.3598	1.4370	1.7237	2.3735
50	1.1111	1.3598	1.4370	1.7237	2.3802
51	1.1221	1.3672	1.4583	1.7557	2.3906
52	1.1221	1.3672	1.4583	1.7557	2.3971
53	1.1221	1.3737	1.4583	1.7557	2.3971
54	1.1432	1.3951	1.4928	1.7878	2.4421
55	1.1613	1.4099	1.5076	1.8133	2.4820
56	1.1613	1.4164	1.5076	1.8133	2.4820
57	1.1613	1.4164	1.5076	1.8198	2.4885
58	1.1897	1.4592	1.6774	2.1030	2.7680
59	1.1962	1.4592	1.6774	2.1030	2.7680
60	1.1962	1.4657	1.6774	2.1095	2.7745
61	1.1962	1.4657	1.6841	2.1095	2.7745

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Polymer Factors for Instrumentation Cables - POC PIS					
Pair Instrumentation Individual and Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1160	0.1170	0.1337	0.1346	0.1726
2	0.1950	0.2126	0.2285	0.2551	0.3100
3	0.1994	0.2191	0.2285	0.2644	0.3325
4	0.2289	0.2539	0.2723	0.3023	0.3985
5	0.2646	0.2885	0.3127	0.3540	0.4774
6	0.2929	0.3300	0.3576	0.4166	0.5515
7	0.2871	0.3226	0.3488	0.4046	0.5321
8	0.3429	0.3764	0.4043	0.4615	0.6250
9	0.3738	0.4275	0.4532	0.5160	0.7060
10	0.4110	0.4502	0.4997	0.5736	0.7657
11	0.4160	0.4702	0.5016	0.5718	0.7794
12	0.4433	0.4977	0.5299	0.6039	0.8152
13	0.4655	0.5268	0.5573	0.6607	0.8838
14	0.4767	0.5404	0.5731	0.6797	0.9122
15	0.5117	0.5772	0.6371	0.7281	0.9941
16	0.5266	0.5934	0.6557	0.7490	1.0244
17	0.5703	0.6232	0.6879	0.8042	1.0892
18	0.5846	0.6400	0.7071	0.8270	1.1223
19	0.5847	0.6397	0.7055	0.8238	1.1161
20	0.6153	0.6933	0.7631	0.8880	1.2007
21	0.6386	0.7250	0.7969	0.9252	1.2473
22	0.6811	0.7649	0.8360	0.9930	1.3768
23	0.6903	0.7753	0.8476	1.0062	1.3963
24	0.7362	0.8267	0.9054	1.0685	1.4608
25	0.7453	0.8371	0.9168	1.0817	1.4803
26	0.7606	0.8539	0.9355	1.1026	1.5077
27	0.7717	0.8870	0.9672	1.1344	1.5577
28	0.8026	0.9217	0.9932	1.1768	1.6222
29	0.8132	0.9343	1.0073	1.1934	1.6463
30	0.8224	0.9447	1.0186	1.2066	1.6659

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Polymer Factors for Instrumentation Cables - POC PIS					
Pair Instrumentation Individual and Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.8880	0.9893	1.1008	1.2919	1.7863
32	0.9027	1.0067	1.1205	1.3155	1.8214
33	0.9119	1.0171	1.1318	1.3286	1.8409
34	0.9402	1.0727	1.1664	1.3727	1.9228
35	0.9521	1.0861	1.1815	1.3903	1.9486
36	0.9707	1.1082	1.2061	1.4202	1.9929
37	0.9677	1.1041	1.2008	1.4122	1.9796
38	0.9956	1.1427	1.2649	1.4803	2.0606
39	1.0073	1.1561	1.2800	1.4978	2.0860
40	1.0194	1.1703	1.2955	1.5162	2.1129
41	1.0780	1.2328	1.3608	1.5876	2.2506
42	1.0983	1.2567	1.3876	1.6200	2.2985
43	1.1100	1.2701	1.4024	1.6374	2.3240
44	1.1484	1.3302	1.4412	1.7017	2.4034
45	1.1600	1.3436	1.4560	1.7192	2.4289
46	1.1625	1.3459	1.4582	1.7209	2.4308
47	1.1741	1.3593	1.4731	1.7383	2.4561
48	1.2063	1.3716	1.5157	1.7940	2.5204
49	1.2427	1.4171	1.5582	1.8357	2.6182
50	1.2544	1.4305	1.5731	1.8529	2.6434
51	1.2683	1.4765	1.5845	1.9048	2.6621
52	1.2806	1.4904	1.6002	1.9233	2.6891
53	1.2920	1.5038	1.6148	1.9404	2.7143
54	1.3260	1.5068	1.6580	1.9807	2.7652
55	1.3342	1.5463	1.7031	1.9972	2.8202
56	1.3514	1.5668	1.7258	2.0247	2.8611
57	1.3630	1.5799	1.7404	2.0418	2.8864
58	1.4284	1.6246	1.8115	2.1284	3.0240
59	1.4398	1.6377	1.8261	2.1458	3.0492
60	1.4556	1.6557	1.8465	2.1704	3.0854
61	1.4552	1.6549	1.8446	2.1669	3.0793

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Copper Factors for Instrumentation Cables - Cu TOS					
Triad Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.0187	0.0263	0.0332	0.0472	0.0748
2	0.0330	0.0481	0.0619	0.0900	0.1457
3	0.0472	0.0699	0.0907	0.1326	0.2160
4	0.0614	0.0917	0.1194	0.1751	0.2866
5	0.0757	0.1135	0.1481	0.2178	0.3569
6	0.0896	0.1350	0.1763	0.2600	0.4265
7	0.1038	0.1565	0.2047	0.3024	0.4968
8	0.1181	0.1783	0.2334	0.3449	0.5671
9	0.1323	0.2001	0.2621	0.3876	0.6374
10	0.1462	0.2216	0.2906	0.4300	0.7075
11	0.1604	0.2434	0.3193	0.4725	0.7779
12	0.1746	0.2652	0.3477	0.5152	0.8482
13	0.1891	0.2875	0.3772	0.5589	0.9208
14	0.2033	0.3093	0.4059	0.6016	0.9911
15	0.2176	0.3310	0.4346	0.6443	1.0616
16	0.2318	0.3526	0.4633	0.6867	1.1322
17	0.2455	0.3736	0.4907	0.7277	1.1998
18	0.2597	0.3954	0.5194	0.7704	1.2699
19	0.2736	0.4169	0.5479	0.8128	1.3402
20	0.2879	0.4387	0.5766	0.8553	1.4105
21	0.3021	0.4605	0.6050	0.8979	1.4808
22	0.3163	0.4820	0.6337	0.9404	1.5512
23	0.3303	0.5038	0.6622	0.9829	1.6215
24	0.3453	0.5266	0.6924	1.0278	1.6958
25	0.3595	0.5484	0.7211	1.0705	1.7664
26	0.3737	0.5701	0.7498	1.1132	1.8367
27	0.3879	0.5919	0.7785	1.1557	1.9073
28	0.4011	0.6122	0.8052	1.1956	1.9729
29	0.4153	0.6340	0.8339	1.2380	2.0432
30	0.4295	0.6557	0.8623	1.2805	2.1135

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Copper Factors for Instrumentation Cables - Cu TOS					
Triad Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.4438	0.6773	0.8910	1.3232	2.1838
32	0.4577	0.6991	0.9195	1.3656	2.2541
33	0.4720	0.7209	0.9482	1.4081	2.3244
34	0.4862	0.7424	0.9766	1.4508	2.3948
35	0.5014	0.7659	1.0076	1.4967	2.4709
36	0.5156	0.7877	1.0363	1.5394	2.5414
37	0.5298	0.8095	1.0650	1.5821	2.6117
38	0.5440	0.8313	1.0937	1.6248	2.6823
39	0.5570	0.8510	1.1196	1.6632	2.7461
40	0.5712	0.8726	1.1483	1.7060	2.8165
41	0.5852	0.8943	1.1768	1.7484	2.8868
42	0.5994	0.9161	1.2055	1.7909	2.9571
43	0.6136	0.9377	1.2339	1.8336	3.0274
44	0.6278	0.9594	1.2626	1.8760	3.0975
45	0.6420	0.9810	1.2911	1.9185	3.1678
46	0.6577	1.0050	1.3228	1.9657	3.2459
47	0.6717	1.0268	1.3515	2.0083	3.3165
48	0.6859	1.0486	1.3802	2.0511	3.3868
49	0.7001	1.0704	1.4089	2.0938	3.4574
50	0.7144	1.0922	1.4376	2.1362	3.5279
51	0.7286	1.1139	1.4663	2.1789	3.5983
52	0.7411	1.1330	1.4913	2.2163	3.6601
53	0.7553	1.1547	1.5199	2.2588	3.7302
54	0.7695	1.1763	1.5484	2.3013	3.8005
55	0.7835	1.1980	1.5771	2.3439	3.8708
56	0.7976	1.2199	1.6058	2.3864	3.9411
57	0.8119	1.2414	1.6342	2.4289	4.0115
58	0.8261	1.2631	1.6630	2.4715	4.0818
59	0.8421	1.2879	1.6954	2.5200	4.1621
60	0.8563	1.3097	1.7241	2.5627	4.2324
61	0.8705	1.3315	1.7528	2.6051	4.3030

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Steel Factors for Instrumentation Cables - Fe TOS					
Triad Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1297	0.1368	0.1449	0.1548	0.1812
2	0.1977	0.2144	0.2271	0.2478	0.3074
3	0.2103	0.2286	0.2410	0.2658	0.3600
4	0.2314	0.2481	0.2632	0.3018	0.4608
5	0.2508	0.2718	0.3018	0.3615	0.5070
6	0.2733	0.3394	0.3587	0.4618	0.5563
7	0.2733	0.3394	0.3587	0.4618	0.5563
8	0.3480	0.4473	0.4702	0.5221	0.6339
9	0.4098	0.4877	0.5138	0.5777	0.7457
10	0.4611	0.5047	0.5334	0.5973	0.8776
11	0.4611	0.5047	0.5334	0.5973	0.8776
12	0.4788	0.5251	0.5540	0.6140	0.9115
13	0.5047	0.5511	0.5854	0.7015	0.9588
14	0.5047	0.5511	0.5854	0.7015	0.9588
15	0.5308	0.5799	0.6170	0.7387	1.0177
16	0.5308	0.5799	0.6170	0.7387	1.0177
17	0.5624	0.6144	0.7092	0.8290	1.0809
18	0.5624	0.6144	0.7092	0.8290	1.0809
19	0.5624	0.6144	0.7092	0.8290	1.0809
20	0.5911	0.6982	0.7444	0.9319	1.2189
21	0.5911	0.7029	0.7491	0.9366	1.2336
22	0.6318	0.7418	0.7925	0.9907	1.3783
23	0.6318	0.7418	0.7925	0.9907	1.3783
24	0.7168	0.7787	0.9414	1.0428	1.5368
25	0.7168	0.7787	0.9414	1.0428	1.5368
26	0.7168	0.7787	0.9414	1.0428	1.5368
27	0.7298	0.9077	0.9615	1.0677	1.5788
28	0.7568	0.9418	1.0001	1.1885	1.6428
29	0.7568	0.9418	1.0001	1.1885	1.6428
30	0.7568	0.9418	1.0001	1.1885	1.6428

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Steel Factors for Instrumentation Cables - Fe TOS					
Triad Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.8331	0.9757	1.0432	1.2432	1.8271
32	0.8331	0.9757	1.0432	1.2432	1.8271
33	0.8331	0.9757	1.0432	1.2432	1.8271
34	0.9309	1.0144	1.0876	1.2942	1.9165
35	0.9309	1.0144	1.0876	1.2942	1.9165
36	0.9309	1.0144	1.0876	1.2942	1.9165
37	0.9309	1.0144	1.0876	1.2942	1.9165
38	0.9710	1.0617	1.2161	1.5235	1.9944
39	0.9710	1.0617	1.2161	1.5235	1.9944
40	0.9710	1.0617	1.2161	1.5235	1.9944
41	1.0096	1.1889	1.2716	1.5793	2.3468
42	1.0096	1.1889	1.2716	1.5793	2.3468
43	1.0096	1.1889	1.2716	1.5793	2.3468
44	1.0527	1.2372	1.3171	1.6498	2.4498
45	1.0527	1.2372	1.3171	1.6498	2.4498
46	1.0527	1.2372	1.3171	1.6498	2.4498
47	1.0527	1.2372	1.3171	1.6498	2.4498
48	1.0729	1.2600	1.3382	1.6777	2.4895
49	1.1737	1.2811	1.5449	1.8497	2.5629
50	1.1737	1.2811	1.5449	1.8497	2.5629
51	1.1784	1.2885	1.5514	1.8638	2.5629
52	1.1784	1.2885	1.5514	1.8638	2.5629
53	1.1784	1.2947	1.5514	1.8638	2.5629
54	1.2053	1.3158	1.5802	1.8959	2.6141
55	1.2174	1.5032	1.6007	1.9212	2.6540
56	1.2174	1.5032	1.6007	1.9212	2.6540
57	1.2174	1.5032	1.6007	1.9212	2.6540
58	1.2631	1.5457	1.6572	1.9852	2.9483
59	1.2631	1.5457	1.6572	1.9852	2.9483
60	1.2631	1.5457	1.6572	1.9852	2.9483
61	1.2631	1.5457	1.6572	1.9852	2.9483

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Polymer Factors for Instrumentation Cables- POC TOS					
Triad Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1229	0.1291	0.1414	0.1489	0.1884
2	0.2057	0.2293	0.2513	0.2848	0.3773
3	0.2162	0.2401	0.2603	0.2928	0.3895
4	0.2476	0.2776	0.3028	0.3474	0.4491
5	0.3007	0.3324	0.3591	0.4109	0.5423
6	0.3409	0.3830	0.4160	0.4857	0.6385
7	0.3359	0.3761	0.4075	0.4736	0.6191
8	0.3928	0.4376	0.4710	0.5411	0.7471
9	0.4365	0.5025	0.5432	0.6170	0.7832
10	0.4650	0.5354	0.5725	0.6541	0.8422
11	0.4646	0.5341	0.5707	0.6508	0.8370
12	0.4979	0.5485	0.6093	0.6925	0.9559
13	0.5451	0.6171	0.6637	0.7627	1.0687
14	0.5596	0.6338	0.6824	0.7846	1.1018
15	0.5993	0.6833	0.7553	0.8638	1.2061
16	0.6116	0.6972	0.7706	0.8817	1.2332
17	0.6501	0.7380	0.8235	0.9587	1.3575
18	0.6661	0.7565	0.8442	0.9837	1.3951
19	0.6652	0.7548	0.8416	0.9788	1.3870
20	0.7224	0.8058	0.8816	1.0300	1.4613
21	0.7156	0.8209	0.8967	1.0453	1.4777
22	0.7648	0.8706	0.9617	1.1454	1.6106
23	0.7760	0.8835	0.9759	1.1621	1.6359
24	0.8429	0.9776	1.0735	1.2715	1.8169
25	0.8552	0.9915	1.0890	1.2895	1.8439
26	0.8555	0.9913	1.0882	1.2875	1.8410
27	0.8921	1.0375	1.1338	1.3352	1.9078
28	0.9283	1.0803	1.1820	1.3945	2.0054
29	0.9428	1.0970	1.2004	1.4164	2.0384
30	0.9549	1.1110	1.2159	1.4344	2.0654

IEEMA(PVC)/Instrumentation Cable/2022/ 20 of 27

IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Polymer Factors for Instrumentation Cables- POC TOS					
Triad Instrumentation Over all Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	1.0261	1.1842	1.2887	1.5200	2.1807
32	1.0166	1.1742	1.2775	1.5077	2.1664
33	1.0279	1.1871	1.2918	1.5244	2.1916
34	1.0685	1.2293	1.3712	1.6104	2.2888
35	1.1108	1.2776	1.4252	1.6731	2.3798
36	1.1310	1.3013	1.4517	1.7053	2.4287
37	1.1260	1.2944	1.4432	1.6932	2.4094
38	1.2035	1.3712	1.4990	1.7877	2.5696
39	1.2155	1.3852	1.5145	1.8057	2.5969
40	1.2282	1.3997	1.5304	1.8243	2.6253
41	1.2651	1.4536	1.6138	1.9154	2.7553
42	1.2883	1.4811	1.6445	1.9525	2.8112
43	1.2624	1.4515	1.6112	1.9140	2.7575
44	1.3297	1.5317	1.6899	2.0110	2.8738
45	1.3410	1.5446	1.7042	2.0277	2.8988
46	1.3813	1.5900	1.7544	2.0850	2.9804
47	1.3935	1.6039	1.7699	2.1030	3.0074
48	1.4100	1.6502	1.8248	2.1518	3.1155
49	1.4594	1.6887	1.8761	2.2154	3.1799
50	1.4717	1.7027	1.8914	2.2333	3.2069
51	1.4823	1.7156	1.9048	2.2488	3.2389
52	1.4955	1.7306	1.9213	2.2681	3.2683
53	1.5137	1.7528	1.9463	2.2984	3.3133
54	1.5536	1.8012	1.9945	2.3870	3.4241
55	1.5932	1.8237	2.0406	2.4005	3.4925
56	1.5625	1.7894	2.0022	2.3567	3.4329
57	1.5737	1.8024	2.0164	2.3735	3.4581
58	1.6163	1.8777	2.0706	2.4604	3.5647
59	1.6801	1.9501	2.1518	2.5549	3.7008
60	1.6959	1.9686	2.1725	2.5798	3.7387
61	1.7055	1.9792	2.1846	2.5930	3.7578

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Copper Factors for Instrumentation Cables - Cu TIS					
Triad Instrumentation Individual & Overall Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.0215	0.0289	0.0364	0.0509	0.0782
2	0.0424	0.0575	0.0713	0.0993	0.1551
3	0.0614	0.0841	0.1048	0.1466	0.2302
4	0.0802	0.1104	0.1381	0.1939	0.3054
5	0.0992	0.1368	0.1714	0.2414	0.3805
6	0.1177	0.1631	0.2044	0.2882	0.4546
7	0.1366	0.1895	0.2377	0.3352	0.5295
8	0.1556	0.2158	0.2709	0.3824	0.6047
9	0.1743	0.2422	0.3042	0.4297	0.6795
10	0.1932	0.2686	0.3375	0.4769	0.7544
11	0.2122	0.2949	0.3708	0.5242	0.8296
12	0.2309	0.3215	0.4040	0.5715	0.9045
13	0.2502	0.3483	0.4383	0.6200	0.9816
14	0.2691	0.3750	0.4716	0.6673	1.0568
15	0.2880	0.4013	0.5048	0.7145	1.1319
16	0.3068	0.4276	0.5383	0.7618	1.2073
17	0.3251	0.4532	0.5703	0.8076	1.2794
18	0.3442	0.4798	0.6039	0.8548	1.3543
19	0.3629	0.5062	0.6371	0.9018	1.4295
20	0.3817	0.5326	0.6704	0.9491	1.5044
21	0.4005	0.5588	0.7036	0.9963	1.5795
22	0.4195	0.5852	0.7369	1.0436	1.6544
23	0.4383	0.6116	0.7702	1.0909	1.7293
24	0.4578	0.6392	0.8050	1.1404	1.8084
25	0.4769	0.6658	0.8385	1.1877	1.8835
26	0.4957	0.6921	0.8718	1.2352	1.9587
27	0.5147	0.7184	0.9050	1.2824	2.0338
28	0.5325	0.7436	0.9365	1.3269	2.1042
29	0.5515	0.7699	0.9698	1.3742	2.1794
30	0.5703	0.7965	1.0031	1.4212	2.2542

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Copper Factors for Instrumentation Cables - Cu TIS					
Triad Instrumentation Individual & Overall Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.5891	0.8228	1.0363	1.4685	2.3291
32	0.6079	0.8492	1.0696	1.5158	2.4043
33	0.6269	0.8756	1.1029	1.5630	2.4791
34	0.6457	0.9019	1.1361	1.6103	2.5543
35	0.6657	0.9300	1.1719	1.6611	2.6352
36	0.6845	0.9566	1.2052	1.7083	2.7103
37	0.7035	0.9829	1.2387	1.7556	2.7855
38	0.7223	1.0096	1.2720	1.8031	2.8606
39	0.7399	1.0339	1.3028	1.8464	2.9293
40	0.7588	1.0602	1.3360	1.8936	3.0041
41	0.7777	1.0866	1.3693	1.9409	3.0790
42	0.7965	1.1132	1.4026	1.9879	3.1542
43	0.8152	1.1395	1.4358	2.0352	3.2291
44	0.8343	1.1659	1.4691	2.0825	3.3039
45	0.8531	1.1923	1.5024	2.1298	3.3791
46	0.8735	1.2208	1.5386	2.1815	3.4617
47	0.8923	1.2474	1.5721	2.2290	3.5368
48	0.9111	1.2738	1.6054	2.2763	3.6120
49	0.9301	1.3004	1.6387	2.3235	3.6874
50	0.9489	1.3267	1.6722	2.3708	3.7625
51	0.9680	1.3531	1.7055	2.4183	3.8377
52	0.9850	1.3769	1.7352	2.4603	3.9040
53	1.0038	1.4032	1.7685	2.5076	3.9789
54	1.0228	1.4296	1.8017	2.5546	4.0538
55	1.0416	1.4562	1.8353	2.6019	4.1290
56	1.0604	1.4826	1.8685	2.6491	4.2039
57	1.0792	1.5089	1.9018	2.6964	4.2788
58	1.0982	1.5353	1.9350	2.7437	4.3539
59	1.1190	1.5646	1.9723	2.7966	4.4388
60	1.1377	1.5912	2.0056	2.8442	4.5139
61	1.1568	1.6176	2.0389	2.8915	4.5891

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Steel Factors for Instrumentation Cables - Fe TIS					
Triad Instrumentation Individual & Overall Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1381	0.1465	0.1545	0.1660	0.1939
2	0.2145	0.2315	0.2437	0.2647	0.4189
3	0.2272	0.2454	0.2594	0.3135	0.4447
4	0.2482	0.2679	0.3137	0.3800	0.4943
5	0.2720	0.3347	0.3525	0.4544	0.5463
6	0.3332	0.4250	0.4544	0.4972	0.5919
7	0.3332	0.4250	0.4544	0.4972	0.5919
8	0.4453	0.4798	0.5121	0.5575	0.8243
9	0.4834	0.5298	0.5617	0.6635	0.9033
10	0.5030	0.5523	0.5813	0.6886	0.9444
11	0.5030	0.5523	0.5813	0.6886	0.9444
12	0.5233	0.5636	0.6016	0.7134	0.9783
13	0.5494	0.5954	0.6813	0.8492	1.0326
14	0.5494	0.5954	0.6813	0.8492	1.0326
15	0.5787	0.6842	0.7213	0.9080	1.1759
16	0.5787	0.6842	0.7213	0.9080	1.1759
17	0.6620	0.7242	0.8699	0.9513	1.4008
18	0.6620	0.7242	0.8699	0.9513	1.4008
19	0.6620	0.7242	0.8699	0.9513	1.4008
20	0.6944	0.8634	0.9127	1.0052	1.4699
21	0.6944	0.8681	0.9174	1.0147	1.4847
22	0.7766	0.9179	0.9765	1.1553	1.5695
23	0.7766	0.9179	0.9765	1.1553	1.5695
24	0.8793	0.9608	1.0241	1.2109	1.7861
25	0.8793	0.9608	1.0241	1.2109	1.7861
26	0.8793	0.9608	1.0241	1.2109	1.7861
27	0.9020	0.9907	1.1282	1.3071	1.8248
28	0.9359	1.0985	1.1674	1.4573	2.0168
29	0.9359	1.0985	1.1674	1.4573	2.0168
30	0.9359	1.0985	1.1674	1.4573	2.0168

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Steel Factors for Instrumentation Cables - Fe TIS					
Triad Instrumentation Individual & Overall Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	0.9698	1.1419	1.2156	1.5135	2.2294
32	0.9698	1.1419	1.2156	1.5135	2.2294
33	0.9698	1.1419	1.2156	1.5135	2.2294
34	1.0938	1.1932	1.4220	1.5767	2.3315
35	1.0938	1.1932	1.4220	1.5767	2.3315
36	1.0938	1.1932	1.4220	1.5767	2.3315
37	1.0938	1.1932	1.4220	1.5767	2.3315
38	1.1329	1.4024	1.4861	1.7654	2.4344
39	1.1329	1.4024	1.4861	1.7654	2.4344
40	1.1329	1.4024	1.4861	1.7654	2.4344
41	1.1885	1.4656	1.5495	1.8551	2.5362
42	1.1885	1.4656	1.5495	1.8551	2.5362
43	1.1885	1.4656	1.5495	1.8551	2.5362
44	1.2987	1.5149	1.7334	2.0413	2.8585
45	1.2987	1.5149	1.7334	2.0413	2.8585
46	1.2987	1.5149	1.7334	2.0413	2.8585
47	1.2987	1.5149	1.7334	2.0413	2.8585
48	1.3286	1.5431	1.7728	2.2075	2.9159
49	1.4442	1.7095	1.8049	2.2592	2.9742
50	1.4442	1.7095	1.8049	2.2592	2.9742
51	1.4516	1.7095	1.8164	2.2772	3.0028
52	1.4516	1.7095	1.8164	2.2772	3.0028
53	1.4516	1.7095	1.8164	2.2772	3.0093
54	1.4795	1.7481	1.8624	2.3276	3.2700
55	1.5009	1.7671	1.8806	2.3506	3.5370
56	1.5009	1.7671	1.8806	2.3506	3.5370
57	1.5009	1.7671	1.8806	2.3506	3.5370
58	1.5430	1.8246	1.9406	2.4190	3.6397
59	1.5430	1.8246	1.9406	2.4190	3.6397
60	1.5430	1.8246	1.9406	2.4190	3.6397
61	1.5430	1.8246	1.9406	2.4190	3.6397

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Polymer Factors for Instrumentation Cables - POC TIS					
Triad Instrumentation Individual & Overall Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
1	0.1233	0.1405	0.1426	0.1613	0.1850
2	0.2242	0.2528	0.2738	0.3046	0.4104
3	0.2400	0.2650	0.2849	0.3215	0.4184
4	0.2742	0.3014	0.3310	0.3834	0.4974
5	0.3246	0.3703	0.3970	0.4439	0.5936
6	0.3775	0.4204	0.4510	0.5193	0.6968
7	0.3728	0.4137	0.4426	0.5075	0.6780
8	0.4318	0.4754	0.5285	0.6006	0.7373
9	0.4958	0.5431	0.6012	0.6901	0.9313
10	0.5245	0.5763	0.6377	0.7265	1.0061
11	0.5251	0.5761	0.6374	0.7245	1.0027
12	0.5427	0.6139	0.6794	0.7750	1.0612
13	0.6086	0.6688	0.7406	0.8635	1.1738
14	0.6242	0.6868	0.7605	0.8869	1.2085
15	0.6704	0.7650	0.8358	0.9798	1.3294
16	0.6836	0.7799	0.8523	0.9993	1.3582
17	0.7305	0.8266	0.9070	1.0719	1.4969
18	0.7479	0.8465	0.9296	1.0986	1.5369
19	0.7475	0.8452	0.9271	1.0942	1.5293
20	0.7870	0.9151	1.0070	1.1562	1.6060
21	0.8033	0.9079	0.9987	1.1738	1.6249
22	0.8594	0.9988	1.0821	1.2805	1.7817
23	0.8717	1.0127	1.0977	1.2984	1.8085
24	0.9577	1.1053	1.2035	1.4129	2.0025
25	0.9710	1.1202	1.2200	1.4321	2.0313
26	0.9723	1.1212	1.2207	1.4316	2.0296
27	1.0239	1.1690	1.2765	1.4892	2.0989
28	1.0623	1.2236	1.3284	1.5790	2.2108
29	1.0779	1.2416	1.3481	1.6024	2.2455
30	1.0909	1.2568	1.3649	1.6217	2.2740

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IEEMA (PVC)/Instrumentation Cable/2022**Effective from: 01st January 2023**

Polymer Factors for Instrumentation Cables - POC TIS					
Triad Instrumentation Individual & Overall Screen Cables					
Cable size in sq.mm No. of Pairs	0.5 sq.mm	0.75 sq.mm	1.0 sq.mm	1.5 sq.mm	2.5 sq.mm
31	1.1639	1.3365	1.4418	1.7150	2.4025
32	1.1558	1.3281	1.4320	1.7047	2.3902
33	1.1681	1.3420	1.4475	1.7226	2.4170
34	1.2195	1.3857	1.5425	1.8070	2.5685
35	1.2628	1.4355	1.5977	1.8713	2.6613
36	1.2845	1.4606	1.6260	1.9052	2.7126
37	1.2798	1.4541	1.6179	1.8936	2.6935
38	1.3479	1.5470	1.6986	2.0001	2.8623
39	1.3612	1.5622	1.7154	2.0196	2.8910
40	1.3750	1.5780	1.7326	2.0398	2.9211
41	1.4230	1.6564	1.8307	2.1352	3.0490
42	1.4472	1.6848	1.8627	2.1738	3.1065
43	1.4222	1.6565	1.8308	2.1365	3.0543
44	1.5099	1.7490	1.9168	2.2371	3.2019
45	1.5221	1.7631	1.9322	2.2551	3.2289
46	1.5638	1.8095	1.9837	2.3138	3.3120
47	1.5767	1.8246	2.0005	2.3330	3.3408
48	1.6219	1.8739	2.0627	2.4040	3.4196
49	1.6659	1.9210	2.1084	2.5024	3.5355
50	1.6789	1.9360	2.1251	2.5219	3.5643
51	1.6909	1.9494	2.1391	2.5385	3.6401
52	1.7051	1.9658	2.1571	2.5592	3.6713
53	1.7253	1.9892	2.1841	2.5912	3.7191
54	1.7741	2.0439	2.2294	2.6525	3.8075
55	1.8258	2.0989	2.2897	2.7070	3.8918
56	1.7964	2.0660	2.2528	2.6651	3.8346
57	1.8087	2.0802	2.2684	2.6831	3.8614
58	1.8452	2.1171	2.3549	2.7792	3.9710
59	1.9100	2.1908	2.4374	2.8747	4.1088
60	1.9272	2.2110	2.4599	2.9016	4.1488
61	1.9381	2.2233	2.4733	2.9170	4.1700

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