



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

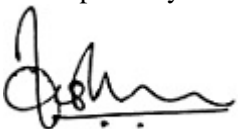

IS-1-15-2004/056

CONTENTS

SI No	Section	Particulars	Page No
1	Section-I	General site conditions	2
2	Section-II	Applicable standards and tests	3
3	Section-III	Scope of supply	4
4	Section-IV	Detailed Technical Specification	14
5	Section-V	Inspection & Testing	15
6	Section-VI	Packing & Marking	16
7	Section-VII	Documentation	16
8	Section-VIII	Information to be furnished along with the offer	16
9	Annexure-1	Sea worthy packing details	6 Sheets
10	Annexure-2	Datasheet of HT Power cables (3.3 KV)	7 Sheets
11	Annexure-3	Datasheet of LT Power cables	31 Sheets
12	Annexure-4	Datasheet of Control cables	74 Sheets
13	Annexure-5	Datasheet of Instrumentation cables	18 Sheets

Please download the annexures from below provided link:-

<https://isgdms.bhel.in/isgdms/Guest/DownloadDocs?token=Da0PH451mlZK7HmIjXBeIV0n4xxkn0LUnAsdSYgZBNU468ZSMlqHroR3cn%2behA1QI0UyiXg8gobf3%2bck4m2x9ZZyIXdoX%2bFKds5wz3UrvQUbfsnkUHaqplrXawcraKc2vwdzcGn8MRnMJocmsjkFhVwePyxklqEh8338rV8GkEnbG8C90sdOnxy%2bVpSN1Iod>

<p>Prepared by</p>  <p>Vishnu S Manager Engineering (Electrical)</p>	<p>Checked & Approved by</p>  <p>Sangeetha MA Dy.General Manager Engineering (Electrical)</p>
---	---



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SECTION - I

General site conditions

Bangladesh-India Friendship Power Company (Pvt.) Ltd. (BIFPCL) is a 50: 50 Joint Venture Company of Bangladesh Power Development Board, Bangladesh (BPDB) and NTPC Limited, India (NTPC), incorporated under the laws of Bangladesh.

BIFPCL has entrusted BHEL the development of the Coal fired 2x660 MW Maitree Super Thermal Power Project on Turnkey Basis at Rampal, Dist.-Bagerhat, Bangladesh, on the bank of river Possur, Bangladesh, for the purposes of supply and sale of electric power to BPDB. For the purposes of setting up the aforesaid 2x660 MW Coal fired Power project at Rampal,

I.1 Site Conditions

Parameters	Unit	Value/Comments
Average Site Reference Conditions (ASC)		
Atmospheric pressure	mbar	1007.6
Ambient air temperature	°C	27.3
Relative humidity	%	87
River water temperature	°C	29.8
Summer Site Reference Conditions (SSC)		
Atmospheric pressure	mbar	1007.9
Ambient air temperature	°C	36.9
Relative humidity	%	60
River water temperature	°C	33
River water conductivity	μS/cm	300
Winter Site Reference Conditions (WSC)		
Atmospheric pressure	mbar	1017.2
Ambient air temperature	°C	12.5
Relative humidity	%	100
River water temperature	°C	20
Reference Site Conditions (RSC)		
Atmospheric pressure	mbar	1007
Ambient air temperature	°C	31
Relative humidity	%	88
River water temperature	°C	32
River water conductivity	μS/cm	30000
Design ambient air temperature for all electrical equipment		
Maximum design temperature (outdoor)	°C	45



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

Maximum daily average ambient shade temperature	°C	38
Maximum monthly average ambient temperature (in the shade)	°C	34.6
Maximum annual average ambient temperature (in the shade)	°C	27.3
Maximum design temperature of the electrical equipments installed indoors in air conditioned rooms	°C	40
Maximum design temperature of the electrical equipments installed indoors in non-air conditioned rooms	°C	45
Minimum design temperature	°C	0
Salty atmosphere	-	The atmosphere contains considerable amounts of salt thus producing severe corrosion which is further enhanced by high ambient humidity.

SECTION – II

Applicable standards

The design, material, construction, manufacture, inspection, testing and performance of Cable Glands, lugs, HT termination kits and cable straight jointing kits shall conform to the latest revision of relevant International Electro-Technical Commission (IEC) / ASTM and other reputed standards and codes of practices mentioned in this specification and any other International standard as applicable.



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SECTION – III

Scope of Supply

This specification covers the design, manufacture, inspection and testing at manufacturer's works, proper sea-worthy packing and delivery of Cable Glands, lugs, HT termination kits and cable straight jointing kits as mentioned in different sections of this specification.

It is not the intent to specify herein all the details of design & manufacture. However, the items listed below shall conform in all respect to high standards of design engineering and workmanship and shall be capable of performing in continuous commercial operation.

Item wise quantity requirement is mentioned in below table.

A1. CABLE GLANDS

SI No	Combined Cable name as in Indent	Cable outer Diameter	Quantity in Numbers	Price Weightage
1	GLANDS-1CX50 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 14.2 mm	14.2	90	0.00245789
2	GLANDS-2CX10 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 18 mm	18	40	0.00113656
3	GLANDS-2CX150 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 34.1 mm	34.1	10	0.00093591
4	GLANDS-2CX16 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 19 mm	19	40	0.00125800
5	GLANDS-2CX2.5 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 14 mm	14	490	0.01155602
6	GLANDS-2CX25 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 19.2 mm	19.2	50	0.00157250
7	GLANDS-2CX300 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 15.5 mm	15.5	10	0.00114568
8	GLANDS-2CX4 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 15.1 mm	15.1	10	0.00024274
9	GLANDS-2CX50 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 23 mm	23	10	0.00041298



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Combined Cable name as in Indent	Cable outer Diameter	Quantity in Numbers	Price Weightage
10	GLANDS-2CX6 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 16.3 mm	16.3	70	0.00173582
11	GLANDS-2CX70 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 26 mm	26	20	0.00119030
12	GLANDS-3.5CX150 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 43.3 mm	43.3	30	0.00421367
13	GLANDS-3.5CX185 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 47.6 mm	47.6	10	0.00148219
14	GLANDS-3.5CX240 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 53.2 mm	53.2	10	0.00200695
15	GLANDS-3.5CX25 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 22.7 mm	22.7	120	0.00495580
16	GLANDS-3.5CX300 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 58.2 mm	58.2	10	0.00239924
17	GLANDS-3.5CX35 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 24.8 mm	24.8	90	0.00428509
18	GLANDS-3.5CX400 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 66.3 mm	66.3	20	0.00608193
19	GLANDS-3.5CX50 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 28.1 mm	28.1	120	0.00714182
20	GLANDS-3.5CX70 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 31.8 mm	31.8	180	0.01423396
21	GLANDS-3.5CX95 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 35.5 mm	35.5	120	0.01123094
22	GLANDS-3CX10 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 17 mm	17	120	0.00340967
23	GLANDS-3CX120 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 37 mm	37	30	0.00308720



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Combined Cable name as in Indent	Cable outer Diameter	Quantity in Numbers	Price Weightage
24	GLANDS-3CX150 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 40.9 mm	40.9	10	0.00132693
25	GLANDS-3CX16 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 19.2 mm	19.2	150	0.00471751
26	GLANDS-3CX185 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 44.3 mm	44.3	40	0.00561823
27	GLANDS-3CX185 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 48 mm	48	10	0.00158052
28	GLANDS-3CX2.5 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 13.4 mm	13.4	1580	0.03726228
29	GLANDS-3CX2.5 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 16 mm	16	10	0.00025142
30	GLANDS-3CX240 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 49.4 mm	49.4	30	0.00473844
31	GLANDS-3CX25 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 21 mm	21	230	0.00767790
32	GLANDS-3CX25 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 23 mm	23	10	0.00046577
33	GLANDS-3CX35 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 23.5 mm	23.5	70	0.00335459
34	GLANDS-3CX4 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 15.8 mm	15.8	30	0.00075098
35	GLANDS-3CX400 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 61 mm	61	20	0.00525390
36	GLANDS-3CX400 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 67 mm	67	20	0.00525390
37	GLANDS-3CX50 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 26.3 mm	26.3	40	0.00212806



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Combined Cable name as in Indent	Cable outer Diameter	Quantity in Numbers	Price Weightage
38	GLANDS-3CX50 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 28 mm	28	10	0.00054133
39	GLANDS-3CX6 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 15.5 mm	15.5	160	0.00400525
40	GLANDS-3CX6 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 18 mm	18	10	0.00029173
41	GLANDS-3CX70 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 29.7 mm	29.7	70	0.00553543
42	GLANDS-3CX70 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 31 mm	31	10	0.00079078
43	GLANDS-3CX95 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 33.3 mm	33.3	90	0.00813236
44	GLANDS-3CX95 Cu VFD,LT-POWER XLPE, FRLS Armoured Copper Cable of outer Dia 35 mm	35	20	0.00205813
45	GLANDS-4CX10 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 20.5 mm	20.5	180	0.00582248
46	GLANDS-4CX16 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 21.5 mm	21.5	250	0.00834554
47	GLANDS-4CX2.5 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 14.3 mm	14.3	40	0.00100131
48	GLANDS-4CX4 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 16.5 mm	16.5	30	0.00084743
49	GLANDS-4CX6 Cu,LT-POWER XLPE, FRLS Unarmoured Copper Cable of outer Dia 17 mm	17	90	0.00256346
50	GLANDS-1CX95 Cu,HT-POWER 3.3KV XLPE, FRLS Unarmoured Copper Cable of outer Dia 23 mm	23	50	0.00217360
51	GLANDS-3CX95 Cu,HT-POWER 3.3KV XLPE, FRLS Unarmoured Copper Cable of outer Dia 50 mm	50	130	0.01618709



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Combined Cable name as in Indent	Cable outer Diameter	Quantity in Numbers	Price Weightage
52	GLANDS-10CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 17 mm	17	30	0.00085242
53	GLANDS-12CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 19 mm	19	200	0.00568279
54	GLANDS-12CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 21 mm	21	190	0.00634261
55	GLANDS-19CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 21.5 mm	21.5	20	0.00066764
56	GLANDS-19CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 24 mm	24	100	0.00510278
57	GLANDS-24CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 24 mm	24	10	0.00054340
58	GLANDS-24CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 27.5 mm	27.5	80	0.00483574
59	GLANDS-27CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 28 mm	28	20	0.00131244
60	GLANDS-2CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 12 mm	12	400	0.00786390
61	GLANDS-2CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 12.5 mm	12.5	6850	0.13466927
62	GLANDS-3CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 12.5 mm	12.5	1200	0.02359170
63	GLANDS-3CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 13.5 mm	13.5	630	0.01485775
64	GLANDS-5CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 14.5 mm	14.5	390	0.00919765
65	GLANDS-5CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 15.5 mm	15.5	400	0.00970950



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Combined Cable name as in Indent	Cable outer Diameter	Quantity in Numbers	Price Weightage
66	GLANDS-7CX1.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 15.5 mm	15.5	500	0.01179186
67	GLANDS-7CX2.5,CONTROL, PVC insulated Unarmoured Copper Cable of outer Dia 16.5 mm	16.5	90	0.00260438
68	GLANDS-10TX1.5,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 22 mm	22	10	0.00028828
69	GLANDS-12PX0.5F,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 18.5 mm	18.5	90	0.00255725
70	GLANDS-12PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 17.5 mm	17.5	270	0.00726189
71	GLANDS-16PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 18 mm	18	210	0.00596693
72	GLANDS-20PX0.5F,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 22 mm	22	90	0.00358816
73	GLANDS-20PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 20 mm	20	10	0.00036763
74	GLANDS-24PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 22 mm	22	120	0.00478421
75	GLANDS-2PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 10 mm	10	3570	0.06944628
76	GLANDS-4PX0.5F,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 11.5 mm	11.5	410	0.00839999
77	GLANDS-4PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 11 mm	11	1200	0.02433693
78	GLANDS-6PX0.5F,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 13 mm	13	60	0.00122927
79	GLANDS-6PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 12.5 mm	12.5	290	0.00594146



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Combined Cable name as in Indent	Cable outer Diameter	Quantity in Numbers	Price Weightage
80	GLANDS-8PX0.5F,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 17.5 mm	17.5	20	0.00058346
81	GLANDS-8PX0.5G,SCREENED, PVC insulated Shielded Unarmoured Cable of outer Dia 16.5 mm	16.5	1160	0.03092617
TOTAL			23,710	

A2.CABLE LUGS

SI No	Item Description	Lug Size in Sq. mm	Quantity	Price Weightage
1	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 2.5mm	2.5	6000	0.00362680
2	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 4mm	4	250	0.00021943
3	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 6mm	6	950	0.00100689
4	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 10mm	10	1100	0.00131389
5	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 16mm	16	1600	0.00257354
6	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 25mm	25	1350	0.00381466
7	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 35mm	35	650	0.00211589
8	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 50mm	50	710	0.00297995
9	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 70mm	70	750	0.00545262



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Item Description	Lug Size in Sq. mm	Quantity	Price Weightage
10	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 95mm	95	700	0.00709462
11	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 120mm	120	90	0.00120337
12	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 150mm	150	120	0.00232612
13	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 185mm	185	160	0.00448465
14	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 240mm	240	130	0.00516022
15	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 300mm	300	40	0.00224059
16	LUGS Single Hole Type-LT-POWER, XLPE Copper of Lug Size 400mm	400	130	0.01025021
17	LUGS Pin type Sleeved-CONTROL, PVC Copper of Lug Size 1.5mm	1.5	12750	0.00377430
18	LUGS Pin type Sleeved-CONTROL, PVC Copper of Lug Size 2.5mm	2.5	24500	0.01001666
19	LUGS Pin type Sleeved-SCREENED, PVC Copper of Lug Size 0.5mm	0.5	74000	0.01853561
20	LUGS Pin type Sleeved-SCREENED, PVC Copper of Lug Size 1.5mm	1.5	290	0.00011856
TOTAL			1,26,270	

A3.STRAIGHT THROUGH JOINTING KITS

SI No	Item Description	Cable outer Diameter	Jointing kit Quantity	Price Weightage
1	Straight through jointing Kit-2CX10 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 18 mm	18	10	0.00207009



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Item Description	Cable outer Diameter	Jointing kit Quantity	Price Weightage
2	Straight through jointing Kit-2CX150 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 34.1 mm	34.1	5	0.00214772
3	Straight through jointing Kit-2CX16 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 19 mm	19	5	0.00080734
4	Straight through jointing Kit-2CX25 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 19.2 mm	19.2	15	0.00246859
5	Straight through jointing Kit-2CX300 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 15.5 mm	15.5	10	0.00584801
6	Straight through jointing Kit-2CX6 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 16.3 mm	16.3	5	0.00074523
7	Straight through jointing Kit-3.5CX150 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 43.3 mm	43.3	15	0.00659842
8	Straight through jointing Kit-3.5CX25 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 22.7 mm	22.7	20	0.00329145
9	Straight through jointing Kit-3.5CX35 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 24.8 mm	24.8	15	0.00251516
10	Straight through jointing Kit-3.5CX400 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 66.3 mm	66.3	20	0.01482186
11	Straight through jointing Kit-3.5CX50 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 28.1 mm	28.1	5	0.00108680
12	Straight through jointing Kit-3.5CX70 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 31.8 mm	31.8	20	0.00440930
13	Straight through jointing Kit-3.5CX95 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 35.5 mm	35.5	40	0.01469766
14	Straight through jointing Kit-3CX10 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 17 mm	17	5	0.00081251
15	Straight through jointing Kit-3CX150 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 40.9 mm	40.9	5	0.00219947
16	Straight through jointing Kit-3CX16 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 19.2 mm	19.2	5	0.00081251
17	Straight through jointing Kit-3CX2.5 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 13.4 mm	13.4	25	0.00406256
18	Straight through jointing Kit-3CX240 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 49.4 mm	49.4	5	0.00320347
19	Straight through jointing Kit-3CX25 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 21 mm	21	10	0.00164572
20	Straight through jointing Kit-3CX400 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 61 mm	61	30	0.02223280
21	Straight through jointing Kit-3CX400 Cu VFD, LT-POWER XLPE, Armoured Copper Cable of outer Dia 67 mm	67	20	0.01482186



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

SI No	Item Description	Cable outer Diameter	Jointing kit Quantity	Price Weightage
22	Straight through jointing Kit-3CX50 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 26.3 mm	26.3	5	0.00108680
23	Straight through jointing Kit-3CX70 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 29.7 mm	29.7	5	0.00110232
24	Straight through jointing Kit-3CX95 Cu VFD, LT-POWER XLPE, Armoured Copper Cable of outer Dia 35 mm	35	5	0.00183721
25	Straight through jointing Kit-4CX10 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 20.5 mm	20.5	5	0.00082286
26	Straight through jointing Kit-4CX16 Cu, LT-POWER XLPE, Unarmoured Copper Cable of outer Dia 21.5 mm	21.5	25	0.00411431
50	Straight through jointing Kit-1CX95 Cu, HT-POWER 3.3KV, XLPE Unarmoured Copper Cable of outer Dia 23 mm	23	10	0.00417124
51	Straight through jointing Kit-3CX95 Cu, HT-POWER 3.3KV, XLPE Unarmoured Copper Cable of outer Dia 50 mm	50	50	0.03570910
TOTAL			395	

A4.HT TERMINATION KITS AND TREFOIL CLAMPS

SI No	Item Description	Quantity in Nos.	Price Weightage
1	HT Termination Kits for 1CX95 Cu, HT-POWER 3.3KV Unarmoured XLPE Copper Cable	40	0.01668495
2	HT Termination Kits for 3CX95 Cu, HT-POWER 3.3KV Unarmoured XLPE Copper Cable	110	0.07856002
3	Trefoil Clamps for 1CX95 Cu, HT-POWER 3.3KV Unarmoured XLPE Copper Cable	3500	0.02415108

NOTES:-

- During issue of manufacturing clearance, the quantity of individual cable sizes may be varied ensuring that the overall Purchase order price is within +/-30 % of the issued price.**



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

2. The outer diameter mentioned in the above tables are indicative. Bidder shall refer approved datasheets attached as ANNEXURES for confirmation.

SECTION – IV

Detailed Technical Specification

1. **Cable Glands** - Cable shall be terminated using double compression type cable glands. Testing requirements of Cable glands shall conform to BS:6121 and gland shall be of robust construction capable of clamping cable and cable armour (for armoured cables) firmly without injury to insulation. Cable glands shall be made of heavy duty brass machine finished and nickel chrome plated. Thickness of plating shall not be less than 10 micron. All washers and hardware shall also be made of brass with nickel chrome plating Rubber components shall be of neoprene or better synthetic material and of tested quality. Cable glands shall be suitable for the sizes of cable supplied/erected. **Cables to be terminated – Unarmored HT power cables, Armoured and Unarmored LT power cables, unarmored Control cables and unarmored Screened (instrumentation) cables**
2. **Cable Lugs** - Cable lugs for power cables shall be tinned copper solderless crimping type suitable for copper compacted conductor cables. Cable lugs and ferrules for control cables shall be tinned copper type. All power cable lugs shall be **Single hole type**. The cable lugs for control cables and screened/instrumentation cables shall be **pin type** and shall be provided with **insulating sleeve**. Cable lugs and ferrule shall conform to DIN standards.
3. **Trefoil Clamps** - Trefoil clamps for single core cables shall be pressure die cast aluminum or fibre glass or nylon and shall include necessary fixing accessories like G.I. nuts, bolts, washers, etc. Trefoil clamps shall have adequate mechanical strength when installed at 0.75 meter intervals to withstand the forces generated by the peak value of maximum system short circuit current.
4. **Termination and Straight through jointing kits** - Termination and jointing kits for 3.3 kV grade XLPE insulated cables shall be of proven design and make which have already been extensively used and **type tested**. Termination kits and jointing kits shall be Pre-moulded type or heat shrinkable type. Further Cold shrinkable type termination and jointing kits are also acceptable. The Cold shrinkable type kits shall be type tested as per relevant standards. Calculation to withstand the required fault level shall also be furnished in case of cold shrinkable type kits. 3.3kV grade joints and terminations shall be type tested and **Type test reports as per IS:13573 Part-II and IEC60502** shall be furnished. Also, heat shrink material shall comply with requirements of ESI 09-13 (external tests). Critical components used in cable accessories shall be of tested and proven quality as per relevant product specification/ESI specification. Cable joints and terminations should be with **FRLS** properties as per IEC 60754-1&2. Kit contents shall be supplied from the same source as were used for type testing. The kit shall be complete with the tinned copper solderless crimping type cable lugs & ferrule or mechanical connectors (wherein bolts are tightened that shear off at an appropriate torque) as per DIN standard suitable for copper compacted conductor cables.

Straight through joint and termination shall be capable of withstanding the fault level of 40 kA for 0.12 sec with a dynamic peak of 100 kA for 3.3 KV system. Straight through joints shall have provisions for shield connection and earthing wherever required and complete with all accessories and consumables suitable for storage without deterioration at a temperature of 50 deg. C with shelf life of more than five years. 1.1KV / 1KV / 600V grade straight through joints shall also be of proven design



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

NOTE :- Approved Datasheet of HT XLPE 3.3KV, LT Power, Control and Screened/Instrumentation cables are attached as Annexures. Bidder shall refer these datasheet and select the Glands, Lugs, HT termination kits, Cable Jointing kits, Trefoil clams etc appropriately.

SECTION – V

Inspection and Testing

The Inspection for equipment under scope shall be done in general as per Customer/BHEL approved QAP/MQP, approved datasheet, specification and relevant standards which shall be submitted and approved during detailed engineering

- 5.1 Inspection call shall be given at least 3 weeks in advance with all test reports. Supplier shall carryout/demonstrates various routine tests and any other test specified by Customer/BHEL at supplier's works at no extra cost.
- 5.2 All reports / certificates shall bear company seal and signature of supplier / manufacturer.
- 5.3 Supplier shall produce during inspection:
 - a) Raw material inspection certificate.
 - b) In House test reports
 - c) Statutory certificates as required.
 - d) Internal inspection & Factory calibration certificate
 - e) Complete BOM including accessories.
- 5.4 All Inspection & Testing shall be carried out based on the following documents: -
 - a. Relevant Standards
 - b. Specifications
 - c. Approved Data sheets
 - d. Approved QAP
- 5.5 The vendor shall maintain and ensure necessary safety measures as required for inspection and tests if any test equipment is found not complying with proper safety requirements, then the inspection agency may withhold inspection till such time the desired safety requirements are met.
- 5.6 **Charges for all tests shall be deemed to be included in the bid price.** There shall be no commercial implication to BHEL on account of minor changes in QP during contract stage.
- 5.7 Type test reports shall be submitted as mentioned in SECTION-IV



**Technical Specification For
Cable Glands, lugs, Trefoil clamps, HT
termination kits and cable straight jointing
kits**

Specification no

**2 X 660MW MAITREE SUPER THERMAL
POWER PROJECT, RAMPAL,
BANGLADESH.**

IS-1-15-2004/056

Section VI

Packing & Marking

- 6.1 Bidder shall provide sea worthy packing as per the details given in Annexure-1
- 6.2 packing and marking shall be as per Annexure-1

Section VII

DOCUMENTATION

Following documents/drawings shall be submitted after placement of order for BHEL & customer's approval

Sl. No.	Drawings/Document Description	Drawings / Document Number	Schedule of Submission
1.	Technical Data Cable Glands, lugs, HT termination kits and cable straight jointing kits	Will be provided later	Within 7 days of LOI
2.	Manufacturing Quality Plan for Cable Glands, lugs, HT termination kits and cable straight jointing kits	Will be provided later	Within 7 days of LOI
3.	Type test reports	Will be provided later	Within 14 days of LOI

- 1) All drawings shall be submitted through WRENCH document management web portal only. Drawing submissions through email is not acceptable. BHEL will provide login ID and password to the successful bidder after placing PO.
- 2) Resubmission of any document incorporating comments shall be made within 3 days
- 3) All documents to be submitted with approved Title Block and Drawing Numbering System, a soft copy of which shall be provided to successful bidder.
- 4) Test certificate shall invariably consist of customer details
- 5) If any additional document is required during detailed engineering it shall be included.
- 6) All drawings provided by the contractor shall be on standard size A4/A3 sheets, in the form of black or blue lines on a white background.
- 7) Approval of drawings shall not relieve the supplier of his responsibility in terms of the contract

Section VIII

Information to be furnished along with the offer

1. Bidder to clearly confirm that no deviation has been taken in this technical specification.
2. Make, Part No, catalogues, test reports (as per relevant standards) shall be furnished along with offer.