SCOPE DESCRIPTION: Supply of K TYPE THERMOCOUPLE

BHEL ENQUIRY NO. H152500152 Dt. 22.11.2025

PROJECT: NALCO DAMANJODI (S.O.7906)

		BILL OF QUANTITIES			
Item Number	Item Title	Item Description	Item Quantity	Unit of Measure	Delivery Period (In number of days)
1	VZ7322098013	K TYPE THERMOCOUPLE, DUPLEX SHEATH SS316	6	no.	42

PRICE SCHEDULE

Enquiry	Material Code	Description	UOM	Quantity	Unit Rate (Excl GST)	Total Rate (Excl GST)
Item SI No						
		K TYPE THERMOCOUPLE, DUPLEX SHEATH SS316				
		K type Thermocouples, Duplex, Thermocouple Sheath: SS316				
1		Thermowell ,Mtl SS316 Adj Flange	6	no.		
		As per Datasheet PHJ2100300-BH1-001 and Drawing provided.				
		IBR: Not required				
					Total	

Note: Vendor shall quote unit price including Freight, P&F, Transit Insurance charges.

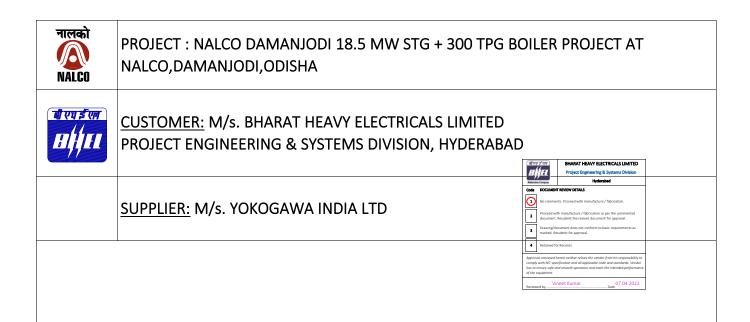
SIGNATURE OF VENDOR WITH STAMP

COMMERCIAL TERMS AND CONDITIONS (For Indigenous Suppliers)

SL. NO.	DESCRIPTION	BHEL REQUIREMENT	SUPPLIER CONFIRMATION
1	PAYMENT TERMS	a) Micro & Small Enterprises (MSEs) 45 Days from date of material acceptance(CRAC) b) Medium Enterprises60 Days from date of material acceptance(CRAC) c) Non MSME90 Days from date of material acceptance(CRAC) All Bank Charges if any to Vendor account only. However, GST portion of invoice shall be released only upon 1. Vendor declaring the invoice in his GSTR-1. 2. Receipt of Goods and Tax Invoice by BHEL. 3. Confirmation of payment of GST thereon by vendor on GSTN Portal. Note: Offer with Payment against Proforma Invoice / Advance payment / LC are not acceptable	SUPPLIER CONFIRMATION
2	DELIVERY PERIOD	The acceptable Delivery period shall be within 42 days from the date of PO. to Invoice/LR date	
3	DELIVERY BASIS/LOCATION	FOR NALCO DAMANJODI SITE	
4	FREIGHT CHARGES	Included. Transportation up to delivery location is in Supplier Scope.	
5	TRANSIT INSURANCE	Included Transit Insurance up to delivery location is in Supplier Scope.	
6	PACKING & FORWARDING	Included.	
7	INSPECTION CHARGES	Not Applicable	
8	OFFER VALIDITY	90 days from the date of Price bid opening.	
9	L.D.CLAUSE	In the event of your failure to dispatch the materials within the delivery period, Liquidated Damages shall be at the rate of 0.5% of the total supply order value per week of delay or part thereof subject to maximum of 10% of the total supply order value. LD shall be reckoned from the date of LR/Invoice whichever is later. Any deviation from the above LD clause, loading shall be applied to the extent of relaxation sought to which it is not agreed by the bidder at offered basic value. In case of LD recovery, the applicable GST shall also be recovered from the supplier.	

COMMERCIAL TERMS AND CONDITIONS (For Indigenous Suppliers)

SL. NO.	DESCRIPTION	BHEL REQUIREMENT	SUPPLIER CONFIRMATION
10	ARBITRATION	Notwithstanding anything contained in any document whatsoever, all questions, matters, disputes and claims relating to and arising out of this contract, shall be referred to sole arbitrator, who shall be appointed by Head of the Unit, BHEL, HPVP, Visakhapatnam at his sole discretion. Such appointment of arbitrator shall not take place unless and until a written request for appointment of arbitrator from any of the parties to the contract has been received by Head of the Unit as aforesaid. The arbitrator shall give his reasoned award. It is a term of this contract that no person other than a person appointed by such Head of the Unit as aforesaid, shall act as arbitrator and if for any reason that is not possible, the matter is not to be referred to arbitration at all. The venue of arbitration shall be such place as may be Fixed by the arbitrator at his sole discretion. The award of arbitrator shall be final, conclusive binding on all the parties to the contract.	
11	JURISDICTION	Not out of this contract including that arise out of arbitration and bank guarantees, shall be initiated, filed and tried only in the courts, tribunals and forums, situated at and having territorial jurisdiction over Visakhapatnam even though such jurisdiction also vests in courts, tribunals & forums situated elsewhere in the country.	
12	RISK PURCHASE	The delivery period stated shall be realistic and shall be strictly adhered to. If the deliveries are not maintained and if on the account, this company is forced to buy the materials elsewhere to avoid any loss or damage that the company may sustain thereby the purchaser is entitled to procure the material at the risk and cost of the seller, which shall be recovered from them out of due of this PO / Contract, any other PO / Contract with BHEL and balance amount if any shall be required to be deposited by the vendor	
13	REJECTION REPLACEMENT	Rejected material, if any, after receipt of material at our end, shall be replaced by you immediately free of cost and also on freight paid basis, failing which Bank Guarantee can be encashed by BHEL.	
14	GUARANTEE CERTIFICATE	Vendor should guarantee the material against all design and manufacturing defects and for performance for a period of 18 months from the date of last dispatch or 12 months from the date of commissioning whichever is earlier. If any defect is noticed during the above period, the same shall be rectified / replaced free of cost on FOR Destination basis within a reasonable time.	
15	FIRM PRICE	Price should be firm till execution of order.	



DATASHEET for THERMOCOUPLE WITH THERMOWELL

BHEL PO NO: T721A00317 DATED 20.09.2021

DOCUMENT TITLE :DATASHEET for THERMOCOUPLE WITH THERMOWELL

SUPPLIER DOC	REV:	02								
01 APPROVAL 17.03.2022 G 00 APPROVAL 15.11.2021 G										
	02 APPROVAL 04.04.2022 GK 01 APPROVAL 17.03.2022 GK 00 APPROVAL 15.11.2021 GK									
02	APPROVAL	04.04.2022	GK	GK		VSY				
01	APPROVAL	17.03.2022	GK	GK		VSY				
00	APPROVAL	15.11.2021	GK	GK		VSY				
REV	FOR	DATE	PREPARED	CHECKED	GK VS					

	BILL	OF MATERL	AL FOR THERMO	COUPLE WI	TH THERMO	WELL					
	व इंग्ल	ITEM	THERMOCOUPLE WITH THE	RMOWELL							
H	HEEL STATES OF S	CUSTOMER	BHARAT HEAVY ELECTRICAL	_S LIMITED							
	THE MANATHA	PROJECT	NALCO DAMANJODI 18.5 M NALCO,DAMANJODI,ODISH		BOILER PROJECT AT						
		PO NO.	T721A00317 DATED 20.0	9.2021							
Sr.	T f la . t	D.O	D	Main su	pply Qty (No's)	Damada					
No.	Type of Instrument	P.O. ref	Range	Used Qty	C. Spare Qty	Remarks					
1	THERMOCOUPLE WITH THERMOWELL	S.No. 66 of Annexure-1	-	23	2						
2	THERMOCOUPLE WITH THERMOWELL	S.No. 67 of Annexure-1	-	7	1						
3	THERMOCOUPLE WITH THERMOWELL	S.No. 68 of Annexure-1		14	2						
4	THERMOCOUPLE WITH THERMOWELL	S.No. 69 of Annexure-1		8	0						
5	THERMOCOUPLE WITH THERMOWELL	S.No. 70 of Annexure-1		4	0						
6	THERMOCOUPLE WITH THERMOWELL	S.No. 71 of Annexure-1		2	0						
7	Double Compression Cab	le Glands Ni. Pltd	Brass, 1/2"NPT(M)			1 No per instrument					
8	Blind Plugs SS3304, 1/2"N	IPT(M)				1 No per instrument					
9	Tag Plate: SS					1 No per instrument					



REV

DATE

DESCRIPTION

PREP

CHKD

APPD

YOKOGAWA INDIA

DOC. No.: PHJ2100300-BH1-001

Products BU - Project Management Group

PROJECT: NALCO DAMANJODI 18.5 MW STG + 300 TPG BOILER PROJECT

CUSTOMER: Bharat Heavy Electricals Limited

CONSULTANT: M. N. DASTUR & COMPANY (P) LTD

END USER: M/s. NALCO, DAMANJODI, ODISHA

PO /	LOI No. :	T721A00317 DATED 20.0	9 2021											
				FUEDMOCOLIDI E WITH THEDMO										
DUC	UMENT :		ERMOCOUPLE WIT	THERMOCOUPLE WITH THERMO	JVVELL									
s No	DESCRIPTION	Ini	SPECIFICATION	THERMOWELL										
1	Element													
2	Construction		K-type Duploy upgrounded Inculated filled with McO											
3	Insulation		Duplex ungrounded, Insulated,filled with MgO Chromel/Alumel											
	Sheath Material	P. Diamotor	316SS & 8 mm											
4				Inian Ninnia of 150mm lang in CC2	04									
5	Adjustable, 3-pie			Union-Nipple of 150mm long in SS3	J 4									
6	Calibration Stand	laru	ANSI MC 96.1 Class		. ID 67									
7	Head			p with SS304 chain, Wheatherproof										
8	Cable Entry			ith Ni-plated brass DC Glands -1 No and	SS304 Plugs -1 No)									
9	Connection		1/2" NPT(M)											
10	Terminal Block		Heat Resist Cerami	c spring loaded terminal block with	Ni.pltd brass terminal									
11	Leads		Hermitically sealed											
12	Accuracy		ClassA/Class1 as pe	er IEC751 / ANSI MC96.1(special Cla	ass)									
13	Sensor Wire Size	!	1.5 sqmm											
14	Element Length		Suitable to reach at bottom of TW											
15	Hot Junction		Grounded/Ungrounded											
16	Sheath Material		SS316											
17	Hazardous area	class	Suitable for Zone-1, IIA/IIB, T3 (only for Ex'd tags)											
			THERMO	WELL										
18	TW Type		Bar stock threaded											
19	Well Material		SS316											
20	Instrument Conn	ection	1/2" NPT (F)											
21	Process Connect	ion	As per Tag List											
22	Bore (ID)		9 mm											
23	Dia (OD)		18 mm tappering f	rom 28mm										
24	Insertion Length	(U)	As per Tag List											
25	Extension Length		As per Tag List											
26	Total Length (L)	. (1)	"U" + "T"											
27	Tip Thickness		4 mm											
	RAL:		14 111111											
28	Make		Gauges Bourdon											
29	Qty		63 Nos.											
	CERTIFICATES	1	03 11031											
a	Material Test cer													
b		icate, PMI Certificate												
С	IBR FORM IIIC (
2	04.04.2022	FOR APPROVAL	GK	GK	VSY									
1	17.03.2022	FOR APPROVAL	GK	GK	VSY									
0	15.11.2021	FOR APPROVAL	GK	GK	VSY									
			i											

TAGII	ST for	RTD with	THERMOW	/FI

| Std. / Doc. |

- ES		20.4	IO. T721A00317 DA	TED 20 00 2024	c. r. oject																				CV. 140.	•		
		PON	IO. 1721A00317 DA	TED 20.09.2021	PROCE	SS PARAMETERS [N	Min./Nor./Max./Des.]			s,						Il dimension	ns		Pi	rocess Pipe		ngth	5	TW nozzle / P				
SR. OS. No No Des	Description	Medium	Process Line Size	Pressure (Kg/cm2(a))		Temp. (°C)		Range	Engg. Unit	Process Connection	IBR	T'well MOC	TW OE) (mm)	TWIL	"L1" "EL" (mm) (mm)	Sheath Length (below NUN) in	OD (mm)	Thk (mm)	ID (mm)	Inside pipe le (mm)		Nozzie ID S (mm)		[Max. Velocity (m/s)/ Density (Kg/m3) / Viscocity]	QTY. No.	Drawign No.	
42 4	06-02-TE-7164B	DSH O/L TEMP	STEAM	NB 350	75.6	75.6	347	347	0 -700	DegC	M42*2, L1-185mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	160	185 100	260	323.9	25	273.9	115 4	41.99	41 (Mini. 39)	45	40/31.5/0.02194	1	FO000094
43 4	06-02-TE-7164C	DSH O/L TEMP	STEAM	NB 350	75.6	75.6	347	347	0 -700	DegC	M42*2, L1-185mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	160	185 100	260	323.9	25	273.9	115 4	41.99	41 (Mini. 39)	45	40/31.5/0.02194	1	FO000094
44 4	06-02-TE-7139	MAIN STM TEMP	STEAM	NB 350	69/70.5/70.5	5	487/487/492	492	0 -700	DegC	M42*2, L1-175mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	150	175 100	250	355.6	27.9	299.8	102.1	34.06	41 (Mini. 39)	45	55/21/0.0282	1	FOO00094
45 4	06-02-TE-7166A	MAIN STM TEMP	STEAM	NB 350	69/70.5/70.5	5	487/487/492	492	0 -700	DegC	M42*2, L1-175mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	150	175 100	250	355.6	27.9	299.8	102.1	34.06 _{(A}	41 (Mini. 39)	45	55/21/0.0282		FO000094
46 4	06-02-TE-7166B	MAIN STM TEMP	STEAM	NB 350	69/70.5/70.5	5	487/487/492	492	0 -700	DegC	M42*2, L1-175mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	150	175 100	250	355.6	27.9	299.8	102.1	34.06 _{(A}	41 (Mini. 39)	45	55/21/0.0282		FO000094-
47 4	06-02-TE-7166C	MAIN STM TEMP	STEAM	NB 350	69/70.5/70.5	5	487/487/492	492	0 -700	DegC	M42*2, L1-175mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	150	175 100	250	355.6	27.9	299.8	102.1	34.06	41 (Mini. 39)	45	55/21/0.0282	1	FO000094
48 4	C. Spare	-	-	-	-	-	-	-	0 -700	DegC	M33*2, L1-250mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	225 166	191 100	266	2050	2050	-2050	-1904 9	92.88	29	45	55/21/0.0282	 	FO000094
49 50	C. Spare	-	-	-	-	-	-	-	0 -700	DegC	M42*2, L1-175mm,N1-100mm (250 Kg/cm2)	IBR SS316		28	18 25	150	175 100	250	355.6	27.9	299.8	102.1	34.06	41 (Mini. 39)	45	55/21/0.0282		FO000094
50 5	06-02-TE-7668	HOT PA FROM APH	AIR	LATER	880mmwc	880mmwc	347	347	0-500	DegC	1 ½", 150#RF, U-1300mm TW:SS316; Adj. Flange: IS2062, 125AARH	\$\$316	A105	26.7	18	1300	1325 100	1400	2050	2050	-2050	-1025 5	50.00	34	300	16/0.556/0.03101	1	FO000094
51 5	06-02-TE-7771	HOT SA FROM APH	AIR	LATER	170mmwc	170mmwc	354	354	0-500	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange: IS2062, 125AARH	\$\$316	A105	26.7	18	1500	1525 100	1600	DUCT: 35: 4560mr		-	-	-	34	300	16/0.566/0.03101	1	FO000094
52 5:	06-02-TE-6573AB	HOT PA TO MILLS AB	PRIMARY AIR	LATER	622mmwc	622mmwc	347	347	0-500	DegC	1 ½", 150#RF, U-950mm TW:SS316; Adj. Flange: IS2062, 125AARH	SS316	A105	26.7	18	950	975 100	1050	DUCT: 15: 1520mr		-	-	-	34	300	16/0.556/0.02934	1	FO000094
53 54	06-02-TE-7773A1	HOT SA TO COMB FURNACE SIDE-A	AIR	LATER	170mmwc	170mmwc	354	354	0 -500	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: IS 2602 Gr. B	SS316	A105	26.7	18	1500	1525 100	1600	DUCT: 23- 1800mr		-	-	-	34	300	16/0.566/0.03101	1	FO000094
54 5	06-02-TE-7773A2	HOT SA TO COMB FURNACE SIDE-A	AIR	LATER	170mmwc	170mmwc	354	354	0 -500	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: IS 2602 Gr. B	SS316	A105	26.7	18	1500	1525 100	1600	DUCT: 23- 1800mr		-	-	-	34	300	16/0.566/0.03101	1	FO000094
55 50	06-02-TE-7773B1	HOT SA TO COMB FURNACE SIDE-B	AIR	LATER	170mmwc	170mmwc	354	354	0 -500	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: IS 2602 Gr. B	SS316	A105	26.7	18	1500	1525 100	1600	DUCT: 23- 1800mr		-	-	-	34	300	16/0.566/0.03101	1	FO000094
56 5	06-02-TE-7773B2	HOT SA TO COMB FURNACE SIDE-B	AIR	LATER	170mmwc	170mmwc	354	354	0 -500	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: IS 2602 Gr. B	SS316	A105	26.7	18	1500	1525 100	1600	DUCT: 23- 1800mr		-	-	-	34	300	16/0.566/0.03101	1	FO000094
57 5	06-02-TE-6573CD	HOT PA TO MILLS CD	PRIMARY AIR	LATER	622mmwc	622mmwc	347	347	0-500	0-500	1 ½", 150#RF, U-950mm TW:SS316; Adj. Flange:125AARHMatl: IS 2602 Gr. B	SS316	A105	26.7	18	950	975 100	1050	DUCT: 20 2050mr		-	-	-	34	300	16/0.556/0.02934	1	FOO00094
58 5	06-02-TE-7867	FLUE GAS TEMP AFTER BOILER BANKS	FLUE GAS	LATER	(-) 17mmwc	(-) 17mmwc	550	550	0 - 800	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: F22	SS316	F22	26.7	18	1500	1525 100	1600	-	-	-	-	-	34	300	13/0.372/0.0384	1	FO000094
59 6	06-02-TE-7892	FLUE GAS TEMP AFTER ECO-1	FLUE GAS	LATER	(-) 34mmwc	(-) 34mmwc	395	395	0 - 600	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: F22	SS316	F22	26.7	18	1500	1525 100	1600	-	-	-	-	-	34	300	13/0.508/0.03261	1	FO000094
60 6	. 06-02-TE-7873A	FLUE GAS TEMP AFTER APH	FLUE GAS	LATER	(-) 150mmwc	(-) 150mmwc	155	155	0 - 250	DegC	1 %", 150#RF, U-1500mm TW:55516, Adj. Flange:125AARH Matl: F22	SS316	F22	26.7	18	1500	1525 100	1600	-	-	-	-	-	34	300	13/0.742/0.0242	1	F0000094
61 6	06-02-TE-7873B	FLUE GAS TEMP AFTER APH	FLUE GAS	LATER	(-) 150mmwc	(-) 150mmwc	155	155	0 - 250	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: F22	SS316	F22	26.7	18	1500	1525 100	1600	-	-	-	-	-	34	300	13/0.252/0.0482	1	FOO00094
62 6	06-02-TE-7862	FLUE GAS TEMP AFTER PLATEN SH	FLUE GAS	LATER	(-) 5mmwc	(-) 5mmwc	1068	1068	0 - 1200	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH Matl: F22	SS316	F22	26.7	18	1500	1525 100	1600	-	-	-	-	-	34	300	13/0.252/0.0482	1	FO000094
63 64	06-02-TE-7864	FLUE GAS TEMP AFTER FINAL SH	FLUE GAS	LATER	(-) 9mmwc	(-) 9mmwc	862	862	0 - 1200	DegC	1 ½", 150#RF, U-1500mm TW:SS316; Adj. Flange:125AARH	SS316	F22	26.7	18	1500	1525 100	1600	-		_			34	300	13/0.232/0.0482	1	F0000094

