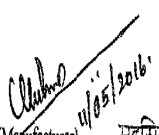


Receipt No : 300124/2024/PS-PEM-S&CE

ENDORSEMENT SHEET FOR Q.P.			
REFERENCE / STANDARD / FIELD QUALITY PLAN (RQP / SQP / RFQP / SFQP)			
TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION			NTPC To be filled in by NTPC
PROJECT NAME	3X660 MW NORTH KARANPURA STPP STAGE I		REVIEW & ENDORSEMENT BY NTPC
CONTRACT No.			PROJECT SPECIFIC Q.P. NUMBER ALLOTTEL
MAIN SUPPLIER	BHEL - NOIDA PW/PE/PG/Kar/P-36/16 DTD: 25/04/2016		Q.P. No.:
MANUFACTURER WORKS & ADDRESS	M/s Instrumentation Limited, Palakkad, Kerala ILP/OR NO:4110065/MR		REV. No.:00 DATE:
ITEM/ EQUIPMENT/ SYSTEM/ SUB-SYSTEM DETAILS i.e. MODEL TYPE/ SIZE/ RATING etc.	CONTROL VALVES APPLICABLE FOR ALL TAG No.s [AS PER ATTACHED ANNEXURE-1]		
APPROVED Q.P. No.:	0000-999-QVP-027	REV. No.: 00	DATE: 11/11/2009
Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)			(TICK APPLICABLE)
I. That the item/ component is identical to that considered for Q.P. approval. OR			The Q.P. is enclosed for this project without any change.
II. That there are minor changes in the item/ component with respect to that considered for Q.P. approval, however the same do not affect the contents of Q.P. OR			
III. That there are minor changes in the item/ component with respect to that considered for Q.P. approval, however the same affect the Q.P. slightly, as indicated below/ in attached sheet			The Q.P. is enclosed for this project with changes as indicated.
NOTES:-			
THE QUANTUM OF CHECK SHALL BE 10% FOR "C/N"			
SIGN.: (Main Supplier)	DATE:	 SIGN.: (Manufacturer) मुनिश. एम.के.पि MUNISH M. K. P. अभियन्ता (गुणवत्ता नियंत्रण) Engineer (QC) इन्स्ट्रुमेंटेशन लिमिटेड INSTRUMENTATION LIMITED (भारत सरकार संस्थान) (A GOVT. OF INDIA ENTERPRISE) गेट नं. 14, प्लॉट नं. 623, पलक्काड, केरला, भारत K.M. MODEL NO. 8 623, PALAKKAD, KERALA, INDIA	NTPC (Reviewed / Approved by / Date & Seal)

FORMAT No.: QS-01-QAI-P-10/F5-R0

conf/Endorsement Sheet NTPC (NTPC) 5/10/2016

ANNEXURE-1**LIST OF ITEMS**

SL NO	TAG NO	VALVE MODEL	SERVICE	VALVE SIZE	RATING (ANSI #)
1	ASV-8	VSN (HT)	D/A PEGGING FROM AUX. STEAM HEADER	10"	300#
2	CRHV-6	VSN(HT)	D/A PEGGING FROM CRH LINE	10"	600#
3	CDV-10,12 & 14	VHD (A)	CEP A/B/C MIN. RECIRCULATION	6"	300#
6	CDV-22 & 25	VSC(M)	MAIN CONDENSATE CONTROL	14"	300# Spl
8	CDV-39	VHD(A)	GSC MIN. FLOW RECIRCULATION	6"	300#
9	CDV-43	VHD(A)	EXCESS RETURN TO CST	6"	300#
10	CDV-72	VSL(CAS)	CONDENSATE FOR VALVE GLAND SEALING	1"	300#
11	DRV-2 & 8	VSC	HPH-7A/7B NORMAL DRAIN TO HPH-6A/6B	6"	600#
13	DRV-5 & 11	VSC	HPH-7A/7B ALT. DRAIN TO F/T	6"	600#
15	DRV-15 & 22	VSC	HPH-6 NORMAL DRAIN TO DEAERATOR	6"	300#
17	DRV-18 & 25	VSC	HPH-6A/6B ALT. DRAIN TO F/T	6"	300#
19	DRV-28	VSC	LPH-3 NORMAL DRAIN TO LPH-2	6"	300#
20	DRV-31	VSC	LPH-3 ALT. DRAIN TO F/T	6"	300#
21	DRV-34	VSC	LPH-2 NORMAL DRAIN TO LPH-1	8"	300#
22	DRV-37	VSC	LPH-2 ALT. DRAIN TO F/T	8"	300#
23	DRV-48	VSC	DEAERATOR OVERFLOW TO F/T	6"	300#
24	DRV-53 & 59	VSC	HPH-8A/8B NORMAL DRAIN TO HPH-7A/7B	4"	900#
26	DRV-56 & 62	VSC(HT)	HPH-8A/8B ALT. DRAIN TO F/T	4"	900#
28	DRV-65	VSC	LPH-4 NORMAL DRAIN TO LPH-3	3"	300#
29	DRV-68	VSC	LPH-4 ALT. DRAIN TO F/T	4"	300#
30	DMV-43	VSC	NORMAL DM MU TO CONDENSATE TANK	3"	300#
31	DMV-78	VSC	EMERGENCY DM MU TO CONDENSATE TANK	6"	300#
32	PGC20AA101	VSC	DMCW SYSTEM - TG AUX.	8"	300#
33	PGC50AA101	VSC	DMCW SYSTEM - SG AUX.	4"	300#

Receipt No : 300124/2024/PS-PEM-S&CE

Manufacturer's Name & Address :- INSTRUMENTATION LTD KANJIKODE WEST PALAKKAD-678823		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC			
ITEM : CONTROL VALVE (Pneumatic operated - Modulating type - Refer NOTE 1)		Q.P. No. RQP-01	REV. No. : 0	DATE : 08.11.09	SIGNATURE : EAPIN VARGHESE	Q.P. No. : 000-PN-CV-P-027	REV. No. & Date : 08/11/09	VAL DUPTO : 08/11/02	REVIEWED BY : D.P. Nair	APPROVED BY : A.K. Datta	
SUB SYSTEM :		PAGE 1 of 3									
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check	Acceptance	Format of record	Agency			
1	2	3	4	5	6	7	8	9	10	11	
1	RAW MATERIAL AND BOUGHT OUT ITEMS										
1.1	Body and Bonnet, (Casting/ Forgings), Plug, Stem, Actuator Stem and Seat Rings	a) Physical and Chemical Properties	Maj.	Physical and Chemical Tests	1/ Heat (HT Batch)	1/ Heat (HT Batch)	Tech. Specification/ Approved Drawing	Tech. Specification/ Approved Drawing	TC	✓ P V V	
		b) Heat Treatment	Maj.	Review of HT chart	Each HT	Each HT	Tech. Specification/ Approved Drawing	Tech. Specification/ Approved Drawing	TC	✓ P V V	
		c) Internal Quality of casting	Maj.	RT for Body and UT for Bonnet	100%	100%	ANSI B 16.34	ANSI B 16.34	TC	✓ P V V	Refer NOTE : 2
		d) Surface Quality	Maj.	Visual	100%	100%	MSS SP 55	MSS SP 55	TC	✓ P V V	
		e) Pressure Test for Shell	Maj.	Hyd. Test	100%	100%	ANSI B 16.34	ANSI B 16.34	TC	✓ P V V	For Body and Bonnet after machining
1.2	Diaphragm	a) Surface Quality	Maj.	Visual	100%	-	Mr. Standard	Mr. Standard	TC	P V -	
		b) Hardness	Maj.	Measu.	100%	-	Mr. Standard	Mr. Standard	TC	P V -	
		c) Endurance/ Life	Maj.	10,000 Cycles	1/ Type	-	10,000 Cycles / As per Mr. Standard	No Damage	TC	P V -	
1.3	Springs	a) Composition	Maj.	Chemical	1 sample/lot	1 sample/lot	Material Spec. / Mr. Std.	Material Spec. / Mr. Std.	TC	P V -	
		b) Mechanical Properties	Maj.	Mech.	1 sample/lot	1 sample/lot	Material Spec. / Mr. Std.	Material Spec. / Mr. Std.	TC	P V -	
		c) Dimension	Maj.	Measu.	1 sample/lot	1 sample/lot	Mr. Std.	Mr. Std.	TC	P V -	
		d) Performance	Maj.	Stiffness Ratio	100%	100%	Approved Drg. / Material Spec.	Approved Drg. / Material Spec.	TC	P V -	
		e) Endurance Test	Maj.	Cyclic Test (Endurance)	1/ Type	1/ Type	Approved Drg. / Material Spec.	Approved Drg. / Material Spec.	TC	P V -	
1.4	Functional test (Limit switches, Solenoids, Positioner, AFR, & Position nominator)	a) Routine Test	Maj.	HV, IR and Continuity	100%	100%	Mr. Standard	Mr. Standard	TC	P V -	
		b) Type tests	Maj.	Review of TC	1/ Type	1/ Type	Mr. Standard	Mr. Standard	TC	P V -	
		c) Degree of protection	Maj.	Review of TC	1/ Type	1/ Type	Mr. Standard	Mr. Standard	TC	P V -	
		d) Functional Test	Maj.	Verification of Operation	-	-	-	-	-	V V V	During Final Testing
1.5	Pressure Gauge	a) Performance	Maj.	Review of Calibration TC	100%	100%	Mr. Standard	Mr. Standard	TC	P V -	
		d) Marking and Dimension	Maj.	Visual	100%	100%	Approved Drg. / Tech. Spec.	Approved Drg. / Tech. Spec.	TC	P V -	

LEGEND * RECORDS IDENTIFIED WITH * SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION
M: MANUFACTURER/ SUB SUPPLIER C: MAIN SUPPLIER, N: NTPC, P: PERFORM, W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLUMN "9" AS "W". ADS - Approved Data Sheet, TC - Test Certificate, TR - Test Records

Note : NTPC Inspection Engineer to check, approval dated revision no. of reference documents at the time of inspection

Format No : (QS-4)-QALP-1071-R0

Engr. Div/QA & I

Receipt No : 300124/2024/PS-PEM-S&CE

		Manufacturer's Name & Address : INSTRUMENTATION LTD KANJIKODE WEST PALAKKAD-678523	REFERENCE QUALITY PLAN							TO BE FILLED IN BY NTPC		
			ITEM : CONTROL VALVE (Pneumatic operated - Modulating type - Refer NOTE 1)	QP No. RQP-01 REV. No. 0 DATE: 09/11/09	SUB SYSTEM : PAGE 2 of 3	EP NO: 300-999-QV1-P-027 REMARKS: 0 Date: 09/11/09 VALID UPTO: 09/11/12	REVIEWED BY: O P Niranjan S Samanta P P Pathi	 APPROVED BY A.K. DATTA NTPC, Noida				
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check	Acceptance	Formal of record	Agency				
1	2	3	4	5	6	7	8	9	10	11		
3.4	Final Inspection	a) Overall Dimension	Mea	Measu	100%	10%	Approved Drawings	Approved Drawings	TR	V	P W W	
		b) Cleanliness and Stamping	Mea	Visual	100%	100%				P	V	
		c) Painting	Mea	Measu	100%	-	Spec/ADS	Spec/ADS	TR	P	-	
NOTE : 1 - All pneumatic operated control valves up to 2500 Class & up to 600 MW except 500 MW BFP Recirculation valve. NOTE : 2 - Only for rating class 900 & above and applicable for Body and Bonnet only. Valve stem for dia > 40 MM UT shall be done on 100 % basis as per ASTM A-288 A and ASME B 16.34. For lower rating as per specification. M/s BHEL to mentioned in the endorsement sheet if any changes are made in the NDT requirement as per specification. NOTE : 3 - A) Air Filler regulator to be procured from M/s Plaka and M/s Shavonogen. B) Smart Positioner (if applicable) to be procured from Siemens, Yokogawa, ABB, Dressor, Fisher, Simar, Masclanien. C) All other bought out items/ accessories are procured from Valve Manufacturer approved sources. NOTE : 4 - IBR Certificate in Form III C shall be submitted if called for in the specification/ Data Sheet. NOTE : 5 - Copies of all TC for materials duly correlated with Heat numbers, TC for electrical items and mechanical tests (Leak/ Operation) shall be furnished to BHEL for verification and acceptance.												
LEGEND : * RECORDS, IDENTIFIED WITH * V* SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION M: MANUFACTURER/ SUB SUPPLIER C: MAIN SUPPLIER, NTPC, P: PERFORM, W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLOUM "N" AS "W", ADS - Approved Data Sheet, TC - Test Certificate, TR - Test Records							Note : NTPC Inspection Engineer to check, approval date/ revision no. of reference documents at the time of inspection					

Format No. QS-01-QALP-10F1-R0

Enag. Div/QA & I

ILP 012

**NORTH KARANPURA STPP
(3 x 660 MW)**

**TECHNICAL SPECIFICATION
FOR
CONTROL VALVE AND ITS ACCESSORIES**

**SPECIFICATION No. PE-TS-405-145-H111
REV NO. 00**



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, INDIA**

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024
INDEX		
SL NO.	DESCRIPTION	SHEET NO.
1	Project Information	3
2	Scope	4
3	General Technical Requirement	5
4	Bill Of Quantity (BOQ), datasheet of CV and its accessories	6-16
5	Quality Plan	17-22
6	Packing Requirement	23
7	Documents to be submitted by Bidder along with bid	24
8	Compliance Certificate	25

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024
PROJECT INFORMATION		
SL.NO	DESCRIPTION	DETAILS
1	CUSTOMER	NTPC
2	CUSTOMER CONSULTANT	NA
3	LOCATION	
3.1	COORDINATES	23°50' North/84°59' East
3.2	NEAREST RAILWAY STATION	KHALARI
3.3	NEAREST SEA PORT	KOLKATA
3.4	NEAREST AIRPORT	RANCHI
3.5	NEAREST STATE HIGHWAY	HAZARIBAGH-CHATRA
4	METEOROLOGICAL DATA	
4.1	MAXIMUM TEMPERATURE	46.6 °C
4.2	MINIMUM TEMPERATURE	0.5 °C
4.3	RELATIVE HUMIDITY (FOR DESIGN)	95%
4.4	AVERAGE ANNUAL RAINFALL	1278 mm
4.5	SEISMIC ZONE (AS PER IS 1893)	Zone-III
4.6	HEIGHT ABOVE MSL	611 METER

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024
SCOPE OF THIS PACKAGE COVERS THE FOLLOWING:		
SL.NO	PARAMETERS	REQUIREMENT
1	Supply Including Design, Engineering, Manufacturing Of	
a)	Main Supply	YES
2	Inspection & Testing	YES
3	Packing	YES
4	Transportation & Delivery To Site	YES
6	Supervision of Servicing of Control Valves	YES

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024
GENERAL TECHNICAL REQUIREMENT		
1.0	Bidder shall also ensure that the offered equipment shall comply with all applicable statutory and regulatory requirements.	
2.0	In the event of any conflict between the requirements of two clauses of this specification, documents or requirements of different codes and standards specified, the more stringent requirement as per the interpretation of the owner shall apply.	
3.0	Document approval by BHEL / Customer shall not absolve the supplier of their contractual obligations of completing the work as per specification requirement without any commercial and delivery impact.	
4.0	PAINTING: Painting of control valve shall be as per the original supply for North karanpura project.	
5.0	CV test is not required to be conduct for the control valves mentioned in the BOQ of this specification.	
6.0	Certificate of compliance for CV accessories shall be provided as per approved data sheet for NKSTPP project.	
7.0	Bidder to ensure the proper functioning of control valve assembly after repair/service of control valve.	

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024

**BILL OF QUANTITY (BOQ), DATASHEET OF CV AND ITS
ACCESSORIES**

Receipt No : 301299/2024/PS-PEM-S&CE

BILL OF QUANTITY (BOQ) FOR CV AND ITS ACCESSORIES (3X660 MW NORTH KARANPURA STPP)					
S NO	TAG NO	SERVICE	DESCRIPTION	QTY	UOM
A) COMPLETE CONTROL VALVE ALONG WITH ACTUATOR AND OTHER ACCESSORIES					
1	CDV-14	CEP A/B/C MIN. RECIRCULATION	CONTROL VALVE VHD 6" 300BW, A217 WC6, CV110, MOD.EQ%, 17-4-PH SS, PB, GRAFOIL-DOUBLE, VA4D	1	NO
2	DRV-11	HPH-7A/7B ALT. DRAIN TO F/T	CONTROL VALVE VSC 6" 600BW, A217 WC9, CV276, EQ%, SS440C, FB, GRAFOIL-DOUBLE, VA3D	1	NO
B) ACTUATOR AND OTHER ACCESSORIES FOR CONTROL VALVES AS APPLICABLE FOR THE TAGS					
1	DRV-5	HPH-7A/7B ALT. DRAIN TO F/T	GASKET(V543/V595) FOR VSC 6" 600	1	ST
			PACKING(GRAFOIL-DOUBLE) FOR VSC 6" 600, VA3D	1	ST
			PRESSURE SEAL FOR VSC 6" 600	1	NO
			VA3D ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
			VOLUME BOOSTER	1	NO
2	DRV-25	HPH-6A/6B ALT. DRAIN TO F/T	GASKET(V543/V595) FOR VSC 6" 300	1	ST
			PACKING(GRAFOIL-DOUBLE) FOR VSC 6" 300, VA3D	1	ST
			PRESSURE SEAL FOR VSC 6" 300	1	NO
			VA3D ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
			VOLUME BOOSTER	1	NO
3	DRV-59	HPH-8A/8B NORMAL DRAIN TO HPH-7A/7B	GASKET(V543(G)/MONEL) FOR VSC 4" 900	1	ST
			PACKING(GRAFOIL) FOR VSC 4" 900, VA3R	1	ST
			PRESSURE SEAL FOR VSC 4" 900	1	NO
			VA3R ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			SOLENOID VALVE	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
4	DRV-56	HPH-8A/8B ALT. DRAIN TO F/T	GASKET(V543(G)/V595) FOR VSC(HT) 4" 900	1	ST
			PACKING(GRAFOIL-DOUBLE) FOR VSC 4" 900, VA3D	1	ST
			PRESSURE SEAL FOR VSC(HT) V 900	1	ST
			VA3D ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
5	DRV-62	HPH-8A/8B ALT. DRAIN TO F/T	GASKET(V543(G)/V595) FOR VSC(HT) 4" 900	1	ST
			PACKING(GRAFOIL-DOUBLE) FOR VSC 4" 900, VA3D	1	ST
			PRESSURE SEAL FOR VSC(HT) 4" 900	1	ST
			VA3D ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
6	DRV-15	HPH-6 NORMAL DRAIN TO DEAERATOR	GASKET(V543/V595) FOR VSC 6" 300	1	ST
			PACKING(GRAFOIL) FOR VSC 6" 300, VA3R	1	ST
			PRESSURE SEAL FOR VSC 6" 300	1	NO
			VA3R ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
			VOLUME BOOSTER	1	NO
7	DRV-28	LPH-3 NORMAL DRAIN TO LPH-2	GASKET(V543/V595) FOR VSC 6" 300	1	ST
			PACKING(GRAFOIL-DOUBLE) FOR VSC 6" 300, VA3R	1	ST
			PRESSURE SEAL FOR VSC 6" 300	1	NO
			VA3R ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
			VOLUME BOOSTER	1	NO

Receipt No : 301299/2024/PS-PEM-S&CE

8	DRV-31	LPH-3 ALT. DRAIN TO F/T	GASKET(V543/V595) FOR VSC 6" 300	1	ST
			PACKING(GRAFOIL-DOUBLE) FOR VSC 6" 300, VA3D	1	ST
			PRESSURE SEAL FOR VSC 6" 300	1	NO
			VA3D ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
			VOLUME BOOSTER	1	NO
9	DRV-53	LPH-3 ALT. DRAIN TO F/T	GASKET(V543(G)/MONEL) FOR VSC 4" 900	1	ST
			PACKING(GRAFOIL) FOR VSC 4" 900, VA3R	1	ST
			PRESSURE SEAL FOR VSC 4" 900	1	NO
			VA3R ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
10	CDV-43	HPH-8A/8B NORMAL DRAIN TO HPH-7A/7B	GASKET(V595) FOR VHD 6" 300	1	ST
			PACKING(GRAFOIL) FOR VHD 6" 300, VA3D	1	ST
			PRESSURE SEAL FOR VHD 6" 300	1	NO
			VA3D ACTUATOR WITH HANDWHEEL ASSEMBLY	1	NO
			AIR FILTER REGULATOR	1	NO
			SMART POSITIONER WITH LINKAGE ASSEMBLY (V18345-1020121001)	1	ST
			UNIVERSAL LIMIT SWITCH ASSEMBLY	1	NO
			EQUIPMENT JUNCTION BOX	1	NO
			SINGLE ACTING AIR LOCK RELAY	1	NO
			VOLUME BOOSTER	1	NO
11	CDV-12	CEP A/B/C MIN. RECIRCULATION	FEEDBACK LINKAGE ASSEMBLY ONLY FOR ABB POSITIONER (V18345-1020121001) VALVE MODEL-VHD(A)-6 INCH-ACTUATOR-VA4D	1	ST
12	DRV-2	HPH-7A/7B NORMAL DRAIN TO HPH-6A/6B	FEEDBACK LINKAGE ASSEMBLY ONLY FOR ABB POSITIONER (V18345-1020421001) VALVE MODEL-VSC-6 INCH-ACTUATOR-VA5R	1	ST
13	DRV-18	HPH-6A/6B ALT. DRAIN TO F/T	FEEDBACK LINKAGE ASSEMBLY ONLY FOR ABB POSITIONER (V18345-1020121001) VALVE MODEL-VSC-6 INCH-ACTUATOR-VA3D	1	ST
14	DRV-34	LPH-2 NORMAL DRAIN TO LPH-1	FEEDBACK LINKAGE ASSEMBLY ONLY FOR ABB POSITIONER (V18345-1020121001) VALVE MODEL-VSC-8 INCH-ACTUATOR-VA4R	1	ST
15	CDV-39	GSC MIN FLOW RECIRCULATION	FEEDBACK LINKAGE ASSEMBLY ONLY FOR ABB POSITIONER (V18345-1020121001) VALVE MODEL-VHD(A)-6 INCH-ACTUATOR-VA3D	1	ST
16	CDV-25	MAIN CONDENSATE CONTROL STN	FEEDBACK LINKAGE ASSEMBLY ONLY FOR ABB POSITIONER (V18345-1020421001) VALVE MODEL-VSC(M) -14 INCH-ACTUATOR-SPA2X MF	1	ST
17	CDV-22	MAIN CONDENSATE CONTROL STN	FEEDBACK LINKAGE ASSEMBLY ONLY FOR ABB POSITIONER (V18345-1020421001) VALVE MODEL-VSC(M) -14 INCH-ACTUATOR-SPA2X MF	1	ST
C) SS TUBING AND FITTINGS FOR CONTROL VALVES AT SL. NO. A1 TO A2 AND B1 TO B10					
1		SS TUBINGS & FITTINGS	SS TUBE 8MM OD FOR 12 VALVES(12X12Mtrs)	144	MTR
			SS TUBE FITTINGS FOR 12 VALVES(ELBOW, TEE,STRAIGHT) ALONG WITH ADAPTOR (1/2"(M) & 1/4"NPT(F/M))	1	ST
D) SUPERVISION OF SERVICING OF CONTROL VALVES					
1	SUPERVISION OF SERVICING OF CONTROL VALVES **			10	MAN -DAY
2	TRAVEL CHARGES FOR ONE VISIT (FOR TWO SERVICE ENGINEER)			1	SET

**Accommodation, local conveyance, Tools & tackles, utilities, lifting/housing, repairing & testing facilities, skilled & unskilled manpower shall be provided by BHEL NKSTPP site.

NOTE : Control valve details indicated above shall also be correlated with datasheet attached elsewhere in the specification for more clarity.

FORM NO. PEM -6666-0

	DATA SHEET FOR CONTROL VALVES PNEUMATIC ACTUATOR)		(WITH		SPECIFICATION NO. PE-TS-405-145-I104A	
					VOLUME II-B	
					SECTION D	
			REV. NO. 02		DATE: 5/11/2016	
			SHEET 1		OF 2	
					NAME GIREESH.V	
					SIGNATURE	
					DATE 11-May-16	
TAG No: CDV-10,CDV-12,CDV-14					QTY: 9	DATA SHEET NO. PES-145-06-DS2-0
DATA SHEET-C						
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)						
GENERAL	PROJECT		NTPC-3X660 MW NORTH KARANPURA STPP (EPC)			
	SERVICE		CEP A/B/C MIN. RECIRCULATION			
	LOCATION		INDOOR			
	DUTY		MODULATING			
	PIPE SIZE (inlet / outlet)		219.1 X 8.18		219.1 X 8.18	
	PIPE MATERIAL (inlet / outlet)		SA 106 GR C		SA 106 GR C	
	BODY	MODEL NUMBER		VHD - 6" X CV = 110		
TYPE OF BODY : GUIDING : NO. OF PORTS		ANGLE	CAGE	ONE		
BODY SIZE : PORT SIZE : DESIGN CV		6"	6"	CV = 110		
END CONNECTION & RATING (ANSI)		BWE	ANSI 300#			
BODY MATERIAL		A217 WC6				
PACKING MATERIAL : SINGLE / DOUBLE		GRAFOIL	DOUBLE			
BONNET TYPE		PLAIN				
TRIM FORM		Mod. Equal%				
TRIM MATERIAL: SEAT PLUG		17-4 PH SS		17-4 PH SS		
TRIM MATERIAL : CAGE GUIDE BUSH		17-4 PH SS		17-4 PH SS		
FLOW		ABOVE SEAT				
MACH NO: / OUTLET VELOCITY		< 7 m/s				
REQUIRED LEAKAGE CLASS		CLASS - V				
NOISE LEVEL (dBA)		<85 dBA				
VACUUM SERVICE		YES				
ANTI CAVITATION TRIM		YES				
PNEUMATIC ACTUATOR	MODEL NO. & SIZE		VA4D			
	CLOSE AT : OPEN AT (Kg/Cm ²)		1.0 Kg/cm ² 0.2 Kg/cm2			
	TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN		< 10 SEC			
	VALVE POSN. ON SIGNAL FAILURE		TO OPEN			
	VALVE POSN. ON SUPPLY AIR FAILURE		STAYPUT			
ACCESSORIES	POSITIONER (SMART)		YES			
	AIR FILTER REGULATOR		YES			
	AIR LOCK RELAY		YES			
	POSITION LIMIT SWITCH		YES			
	POSITION TRANSMITTER		PART OF POSITIONER			
	SOLENOID VALVE		NO			
	E/P CONVERTER		PART OF POSITIONER			
	JUNCTION BOX		YES			
	HAND WHEEL (SIDE MOUNTED)		YES			
	LOCAL POSITION INDICATOR		YES			

Receipt No : 301299/2024/PS-PEM-S&CE

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)				SPECIFICATION NO. PE-TS-405-145-1104A				
					VOLUME II-B				
					SECTION D				
					REV. NO. 02		DATE: 10-May-16		
SHEET		2		OF		2			
TAG No: CDV-10,CDV-12,CDV-14				QTY : 9		DATA SHEET NO. PES-145-06-DS2-0			
Data Sheet C									
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)									
PERFORMANCE OF VALVE	LINEARITY			+ 1 %					
	HYSTERESIS			± 1%					
	SENSITIVITY			±0.5%					
	ACCURACY (OVERALL)			± 2%					
SERVICE CONDITION	SL. NO.	LOAD	FLOW T/HR	INLET PR. KG/CM ² (A)	OUTLET PR. KG/CM ² (A)	TEMP. DEG.(C)	CALCU - LATED CV	% VALVE LIFT	VALVE O/L VELOCITY
	1	MIN.	30	35.6	1.4	65	6.3	15.0	0.45
	2	MAX.	300	38	2.1	69.2	60.9	80.1	4.55
	VALVE TYPE						HIGH DP / CAVITATION		
MAX SHUT OFF PRESS ((KG/CM ² g)						49			
BODY DESIGN : PRESS ((KG/CM ² g) TEMP (DEG. C)						49/VACUUM 75			
IBR FORM III-C						NO			
TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) in Kg.				~700					

FORM NO. PEM -6666-(

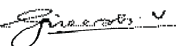
बी.एस.एल.	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)		SPECIFICATION NO. PE-TS-405-145-I104A	
			VOLUME II-B	
			SECTION D	
			REV. NO.02	DATE: 06/06/16
		SHEET	1	OF 2
			NAME	GIREESH.V
			SIGNATURE	
			DATE	6-Jun-16
TAG No: DRV-5 & DRV-11		QTY: 6	DATA SHEET NO. PES-145-06-DS2-0	
DATA SHEET-C				
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)				
GENERAL	PROJECT	NTPC-3X660 MW NORTH KARANPURA STPP (EPC)		
	SERVICE	HPH-7A/7B ALT. DRAIN TO F/T		
	LOCATION	INDOOR		
	DUTY	MODULATING		
	PIPE SIZE (inlet / outlet)	273 X 12.7	323.9 X 12.7	
	PIPE MATERIAL (inlet / outlet)	SA 106 GR C	SA 106 GR C	
BODY	MODEL NUMBER	VSC - 6" X CV = 275		
	TYPE OF BODY : GUIDING : NO. OF PORTS	GLOBE	CAGE	ONE
	BODY SIZE : PORT SIZE : DESIGN CV	6"	5"	CV = 275
	END CONNECTION & RATING (ANSI)	BWE	ANSI 600#	
	BODY MATERIAL	A217 WC9		
	PACKING MATERIAL : SINGLE / DOUBLE	GRAFOIL	DOUBLE	
	BONNET TYPE	FINNED		
	TRIM FORM	Equal%		
	TRIM MATERIAL: SEAT PLUG	SS 440 C	SS 440 C	
	TRIM MATERIAL : CAGE GUIDE BUSH	SS 440 C	SS 440 C	
	FLOW	ABOVE SEAT		
	MACH NO: / OUTLET VELOCITY	< 7 m/s		
	REQUIRED LEAKAGE CLASS	CLASS - V		
	NOISE LEVEL (dBA)	<85 dBA		
	VACUUM SERVICE	YES		
	ANTI CAVITATION TRIM	NO		
	PNEUMATIC ACTUATOR	MODEL NO. & SIZE	VA3D	
CLOSE AT : OPEN AT (Kg/Cm ²)		1.0 Kg/cm ² 0.2 Kg/cm2		
TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN		< 10 SEC		
VALVE POSN. ON SIGNAL FAILURE		TO OPEN		
VALVE POSN. ON SUPPLY AIR FAILURE		TO OPEN		
ACCESSORIES	POSITIONER (SMART)	YES		
	AIR FILTER REGULATOR	YES		
	AIR LOCK RELAY	YES		
	POSITION LIMIT SWITCH	YES		
	POSITION TRANSMITTER	PART OF POSITIONER		
	SOLENOID VALVE	YES		
	E/P CONVERTER	PART OF POSITIONER		
	JUNCTION BOX	YES		
	HAND WHEEL (SIDE MOUNTED)	YES		
	LOCAL POSITION INDICATOR	YES		
28 of 238				

	DATA SHEET FOR CONTROL VALVES (WITH PNEUMATIC ACTUATOR)				SPECIFICATION NO. PE-TS-405-145-I104A				
					VOLUME II-B				
					SECTION D				
					REV. NO.02		DATE: 6-Jun-16		
					SHEET 2		OF 2		
TAG No: DRV-5 & DRV-11					QTY : 6		DATA SHEET NO. PES-145-06-DS2-0		
Data Sheet C									
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)									
PERFORMANCE OF VALVE	LINEARITY			+ 1 %					
	HYSTERESIS			± 1%					
	SENSITIVITY			±0.5%					
	ACCURACY (OVERALL)			± 2%					
SERVICE CONDITION	SL. NO.	LOAD	FLOW T/HR	INLET PR. KG/CM ² (A)	OUTLET PR. KG/CM ² (A)	TEMP. DEG.(C)	CALCU - LATED CV	% VALVE LIFT	VALVE O/L VELOCITY
	1	40% LOAD	54.02	26.5	0.3	222.8	58.5	54.5	1.06
	2	60% LOAD	81.1	35.6	0.3	241.2	72.0	60.6	1.65
	3	100% LOAD	173.5	57	0.3	270.7	125.3	76.9	3.72
	4	VWO	190	60.4	0.5	274.5	133.8	78.8	4.11
	VALVE TYPE						FLASHING		
MAX SHUT OFF PRESS ((KG/CM ² g)						73.1			
BODY DESIGN : PRESS ((KG/CM ² g) TEMP (DEG. C)						73.1 285			
IBR FORM III-C						NO			
TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) in Kg.				~260					
Reference Document No.: 40% - T0351 R4 60% - T0306 R4 100%- T0308 R4 VWO-T0315R3									

Receipt No : 301299/2024/PS-PEM-S&CE

	Technical specification for control valves with accessories (Pneumatically Operated)		SPECIFICATION NO. PE-TS-405-145-I801	
			VOLUME II-B	
			SECTION D	
			REV. NO.02	DATE: 10-May-16
			SHEET	1 OF 7
APPLICABLE TAG No:	ASV-8, CDV-10, CDV-12, CDV-14, CDV-39, CDV-43, CDV-72, DRV-2 , DRV-8, DMV-43, DMV-78		DATA SHEET NO. PES-145-06-DS2-1	
Data Sheet C				
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC OPERATED ACTUATOR)				
POSITIONER (SMART) WITH HART PROTOCOL	MFR. & MODEL NUMBER		ABB MAKE SINGLE ACTING FAIL SAFE MODEL :- V18345-1020121001	
	BYPASS	GAUGES	ENCL. CLASS	NO / TWO/ IP65
	INPUT SIGNAL (mA)		4~20mA	
	OUTPUT SIGNAL (Kg / Cm ²)		TO SUIT ACTUATOR	
AIR FILTER REGULATOR	MFR. & MODEL NUMBER		SHAVO NORGREN Make, Model- 11-4 SN	
	AIR SUPPLY PRESS (Kg / Cm ² g)		7 Kg / Cm ²	
	OUTPUT PRESS (Kg / Cm ² g)		TO SUIT ACTUATOR	
	FILTER SIZE		5 MICRON	
AIR LOCK	MFR. & MODEL NUMBER		ILP / SALR	
	SET PRESS (Kg / Cm ²)		TO SUIT ACTUATOR	
	SUPPLY PRESS (Kg / Cm ²)		7 Kg / Cm ²	
	RESET TYPE		AUTO	
LIMIT SWITCH	MFR. & MODEL NUMBER		ILP / ULA - 202	
	OPEN posn	INT posn	CLOSE posn	1 NO - 1 NO
	CONTACT TYPE		SPDT 2 NO + 2 NC	
	RATING (AC / DC)		5A 240V AC and 0.2A 220V DC	
POSITION TRANSMITTER (PART OF POSITIONER)	MFR. & MODEL NUMBER		IP -65	
	TYPE		PART OF POSITIONER	
	SUPPLY			
	OUTPUT RATING			
SOLENOID VALVE	MFR. & MODEL NUMBER			
	RATING			
	TYPE			
	OPERATION		QUANTITY	
HAND WHEEL	ORIENTATION		SIDE MOUNTED	
	MFR. & MODEL NUMBER		ILP MAKE, MODEL - EJB - 103	
	NO. OF WAYS		36 Ways	
	SIZE		AS REQUIRED	
JUNCTION BOX	CABLE GLANDS :(SIZE / QUANTITY)		AS REQUIRED, DOUBLE COMP.	
	ENCLOSURE CLASS		IP - 65	
	POSITION TRANSMITTER		PART OF POSITIONER	
	INPUT SIGNAL			
I/P CONVERTER (PART OF POSITIONER)	SPLIT RANGE			
	ENCLOSURE CLASS			
	CU TUBING & FITTING PER CV		25 Meters of 1/4" PVC coated Cu. Tubing, with 1set of brass fittings for each CV for connection to IA Header on one end and accessories on another end of CV.	
	This is in addition to CU Tubing and fittings which are integral part of Cv			
NOTE : SMART POSITIONER WITH 4-20 mA HART SIGNAL.				
 GIREESH.V 10-May-16 INSTRUMENTATION LTD KANUNGE WADI, PALAKKAD - 678 623 60 of 238				

Receipt No : 301299/2024/PS-PEM-S&CE

	Technical specification for control valves with accessories (Pneumatically Operated)		SPECIFICATION NO. PE-TS-405-145-I801	
			VOLUME II-B	
			SECTION D	
			REV. NO. 02	DATE: 10-May-16
			SHEET	1 OF 7
APPLICABLE TAG No:	DRV-5 , DRV-11, DRV-15 , DRV-22, DRV- 18, DRV-25, DRV-28, DRV-31, DRV-53 , DRV-59, DRV-56 , DRV-62, DRV-65, DRV-68		DATA SHEET NO. PES-145-06-DS2-1	
Data Sheet C				
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC OPERATED ACTUATOR)				
POSITIONER (SMART) WITH HART PROTOCOL	MFR. & MODEL NUMBER		ABB MAKE SINGLE ACTING FAIL SAFE MODEL :- V18345-1020121001	
	BYPASS	GAUGES	ENCL. CLASS	NO / TWO/ IP65
	INPUT SIGNAL (mA)		4~20mA	
	OUTPUT SIGNAL (Kg / Cm ²)		TO SUIT ACTUATOR	
AIR FILTER REGULATOR	MFR. & MODEL NUMBER		SHAVO NORGREN Make, Model- 11-4 SN	
	AIR SUPPLY PRESS (Kg / Cm ² g)		7 Kg / Cm ²	
	OUTPUT PRESS (Kg / Cm ² g)		TO SUIT ACTUATOR	
	FILTER SIZE		5 MICRON	
AIR LOCK	MFR. & MODEL NUMBER		ILP / SALR	
	SET PRESS (Kg / Cm ²)		TO SUIT ACTUATOR	
	SUPPLY PRESS (Kg / Cm ²)		7 Kg / Cm ²	
	RESET TYPE		AUTO	
LIMIT SWITCH	MFR. & MODEL NUMBER		ILP / ULA - 202	
	OPEN posn	INT posn	CLOSE posn	1 NO - 1 NO
	CONTACT TYPE		SPDT 2 NO + 2 NC	
	RATING (AC / DC)		5A 240V AC and 0.2A 220V DC	
POSITION TRANSMITTER (PART OF POSITIONER)	MFR. & MODEL NUMBER		IP -65	
	TYPE		PART OF POSITIONER	
	SUPPLY			
	OUTPUT RATING			
SOLENOID VALVE	MFR. & MODEL NUMBER		ROTEX MAKE, MODEL - 30301-2.5-2R-B2-S2-24VDC-16H	
	RATING		24 VDC	
	TYPE		3 WAY (UNIVERSAL OPERATION TYPE)	
	OPERATION		QUANTITY	INTERLOCK 1
HAND WHEEL	MFR. & MODEL NUMBER		ILP MAKE, MODEL - EJB - 103	
	NO. OF WAYS		36 Ways	
	SIZE		AS REQUIRED	
	CABLE GLANDS :(SIZE / QUANTITY)		AS REQUIRED, DOUBLE COMP.	
I/P CONVERTER (PART OF POSITIONER)	MFR. & MODEL NUMBER		IP - 65	
	TYPE			
	OPERATION			
	COIL INSULATION CLASS			
JUNCTION BOX	POSITION TRANSMITTER		PART OF POSITIONER	
	INPUT SIGNAL			
	SPLIT RANGE			
	ENCLOSURE CLASS			
CU TUBING & FITTING PER CV	This is in addition to CU Tubing and fittings which are integral part of Cv		25 Meters of 1/4" PVC coated Cu. Tubing, with 1set of brass fittings for each CV for connection to IA Header on one end and accessories on another end of CV.	
	NOTE : SMART POSITIONER WITH 4-20 mA HART SIGNAL.			
 GIREESH.V 10-May-16				
INSTRUMENTATION LTD KANJANPALLE WDG, PALAKKAD - 678 829				

FORM NO. - 6666-0 	Technical specification for control valves with accessories (Pneumatically Operated)		SPECIFICATION NO. PE-TS-405-145-I801	
			VOLUME II-B	
			SECTION D	
			REV. NO. 02	DATE: 10-May-16
			SHEET	1 OF 7
APPLICABLE TAG No:	DRV-34, DRV-37		DATA SHEET NO. PES-145-06-DS2-1	
Data Sheet C				
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC OPERATED ACTUATOR)				
POSITIONER (SMART) WITH HART PROTOCOL	MFR. & MODEL NUMBER		ABB MAKE SINGLE ACTING FAIL SAFE MODEL :- V18345-1020121001	
	BYPASS	GAUGES	ENCL. CLASS	NO / TWO/ IP65
	INPUT SIGNAL (mA)		4~20mA	
	OUTPUT SIGNAL (Kg / Cm ²)		TO SUIT ACTUATOR	
AIR FILTER REGULATOR	MFR. & MODEL NUMBER		SHAVO NORGREN Make, Model- 11-4 SN	
	AIR SUPPLY PRESS (Kg / Cm ² g)		7 Kg / Cm ²	
	OUTPUT PRESS (Kg / Cm ² g)		TO SUIT ACTUATOR	
	FILTER SIZE		5 MICRON	
AIR LOCK	MFR. & MODEL NUMBER		ILP / SALR	
	SET PRESS (Kg / Cm ²)		TO SUIT ACTUATOR	
	SUPPLY PRESS (Kg / Cm ²)		7 Kg / Cm2	
	RESET TYPE		AUTO	
	VENT PLUG		YES	
LIMIT SWITCH	MFR. & MODEL NUMBER		ILP / ULA - 202	
	OPEN posn	INT posn	CLOSE posn	1 NO - 1 NO
	CONTACT TYPE		SPDT 2 NO + 2 NC	
	RATING (AC / DC)		5A 240V AC and 0.2A 220V DC	
	ENCLOSURE CLASS		IP -65	
POSITION TRANSMITTER (PART OF POSITIONER)	MFR. & MODEL NUMBER		PART OF POSITIONER	
	TYPE			
	SUPPLY			
	OUTPUT RATING			
SOLENOID VALVE	MFR. & MODEL NUMBER		ROTEX MAKE, MODEL - 30309-7-2R-B2-S2-24VDC-16H	
	RATING		24 VDC	
	TYPE		3 WAY (UNIVERSAL OPERATION TYPE)	
	OPERATION	QUANTITY	INTERLOCK 1	
	COIL INSULATION CLASS		CLASS - H	
HAND WHEEL	ORIENTATION		SIDE MOUNTED	
	MFR. & MODEL NUMBER		ILP MAKE, MODEL - EJB - 103	
JUNCTION BOX	NO. OF WAYS		36 Ways	
	SIZE		AS REQUIRED	
	CABLE GLANDS :(SIZE / QUANTITY)		AS REQUIRED, DOUBLE COMP.	
	ENCLOSURE CLASS		IP - 65	
I/P CONVERTER (PART OF POSITIONER)	POSITION TRANSMITTER		PART OF POSITIONER	
	INPUT SIGNAL			
	SPLIT RANGE			
	ENCLOSURE CLASS			
CU TUBING & FITTING PER CV	This is in addition to CU Tubing and fittings which are integral part of Cv		25 Meters of 1/4" PVC coated Cu. Tubing, with 1set of brass fittings for each CV for connection to IA Header on one end and accessories on another end of CV.	
NOTE : SMART POSITIONER WITH 4-20 mA HART SIGNAL.				
 GIREESH.V 10-May-16 INSTRUMENTATION LTD KANJIGUDE WOOT, PALAKKAD - 678 623 63 of 238				

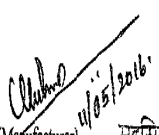
Receipt No : 301299/2024/PS-PEM-S&CE

	Technical specification for control valves with accessories (Pneumatically Operated)		SPECIFICATION NO. PE-TS-405-145-I801	
			VOLUME II-B	
			SECTION D	
			REV. NO. 02	DATE: 10-May-16
			SHEET 1	OF 7
APPLICABLE TAG No:	CRHV-6, CDV-22 , CDV-25,		DATA SHEET NO. PES-145-06-DS2-1	
Data Sheet C				
DATA SHEET-C FOR CONTROL VALVE (WITH PNEUMATIC OPERATED ACTUATOR)				
POSITIONER (SMART) WITH HART PROTOCOL	MFR. & MODEL NUMBER		ABB MAKE DOUBLE ACTING FAIL SAFE MODEL :- V18345-1020421001	
	BYPASS	GAUGES	ENCL. CLASS	NO / TWO/ IP65
	INPUT SIGNAL (mA)		4~20mA	
	OUTPUT SIGNAL (Kg / Cm ²)		TO SUIT ACTUATOR	
AIR FILTER REGULATOR	MFR. & MODEL NUMBER		SHAVO NORGREN Make, Model- 11-4 SN	
	AIR SUPPLY PRESS (Kg / Cm ² g)		7 Kg / Cm ²	
	OUTPUT PRESS (Kg / Cm ² g)		TO SUIT ACTUATOR	
	FILTER SIZE		5 MICRON	
AIR LOCK	MFR. & MODEL NUMBER		ILP / DALR	
	SET PRESS (Kg / Cm ²)		TO SUIT ACTUATOR	
	SUPPLY PRESS (Kg / Cm ²)		7 Kg / Cm ²	
	RESET TYPE		AUTO	
LIMIT SWITCH	MFR. & MODEL NUMBER		ILP / ULA - 202	
	OPEN posn	INT posn	CLOSE posn	1 NO - 1 NO
	CONTACT TYPE		SPDT 2 NO + 2 NC	
	RATING (AC / DC)		5A 240V AC and 0.2A 220V DC	
POSITION TRANSMITTER (PART OF POSITIONER)	MFR. & MODEL NUMBER		IP -65	
	TYPE		PART OF POSITIONER	
	SUPPLY			
	OUTPUT RATING			
SOLENOID VALVE	MFR. & MODEL NUMBER			
	RATING			
	TYPE			
	OPERATION		QUANTITY	
HAND WHEEL	ORIENTATION		SIDE MOUNTED	
	MFR. & MODEL NUMBER		ILP MAKE, MODEL - EJB - 103	
	NO. OF WAYS		36 Ways	
	SIZE		AS REQUIRED	
JUNCTION BOX	CABLE GLANDS :(SIZE / QUANTITY)		AS REQUIRED, DOUBLE COMP.	
	ENCLOSURE CLASS		IP - 65	
	POSITION TRANSMITTER		PART OF POSITIONER	
	INPUT SIGNAL			
I/P CONVERTER (PART OF POSITIONER)	SPLIT RANGE			
	ENCLOSURE CLASS			
	CU TUBING & FITTING PER CV		25 Meters of 1/4" PVC coated Cu. Tubing, with 1set of brass fittings for each CV for connection to IA Header on one end and accessories on another end of CV.	
	This is in addition to CU Tubing and fittings which are integral part of Cv			
NOTE : SMART POSITIONER WITH 4-20 mA HART SIGNAL.				
 GIREESH.V 10-May-16 INSTRUMENTATION LTD KANJIRHOLE WOOD, PALAKKAD - 678 623 61 of 238				

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024

Quality Plan

Receipt No : 301299/2024/PS-PEM-S&CE

ENDORSEMENT SHEET FOR Q.P.			
REFERENCE / STANDARD / FIELD QUALITY PLAN (RQP / SQP / RFQP / SFQP)			
TO BE FILLED IN BY SUPPLIER AT TIME OF SUBMISSION		NTPC	To be filled in by NTPC
PROJECT NAME	3X660 MW NORTH KARANPURA STPP STAGE I		REVIEW & ENDORSEMENT BY NTPC
CONTRACT No.			PROJECT SPECIFIC Q.P. NUMBER ALLOTTEL
MAIN SUPPLIER	BHEL - NOIDA PW/PE/PG/Kar/P-36/16 DTD: 25/04/2016		Q.P. No.:
MANUFACTURER WORKS & ADDRESS	M/s Instrumentation Limited, Palakkad, Kerala ILP/OR NO:4110065/MR		REV. No.:00 DATE:
ITEM/ EQUIPMENT/ SYSTEM/ SUB-SYSTEM DETAILS i.e. MODEL TYPE/ SIZE/ RATING etc.	CONTROL VALVES APPLICABLE FOR ALL TAG No.s [AS PER ATTACHED ANNEXURE-1]		
APPROVED Q.P. No.:	0000-999-QVI-P-027	REV. No.: 00	DATE: 11/11/2009
Confirmation by Main Supplier (TICK WHICHEVER APPLICABLE)		(TICK APPLICABLE)	
I. That the item/ component is identical to that considered for Q.P. approval. OR		The Q.P. is enclosed for this project without any change.	
II. That there are minor changes in the item/ component with respect to that considered for Q.P. approval, however the same do not affect the contents of Q.P. OR			
III. That there are minor changes in the item/ component with respect to that considered for Q.P. approval, however the same affect the Q.P. slightly, as indicated below/ in attached sheet		The Q.P. is enclosed for this project with changes as indicated.	
NOTES:-			
THE QUANTUM OF CHECK SHALL BE 10% FOR "C/N"			
SIGN.: (Main Supplier)	DATE:	 SIGN.: (Manufacturer) मुनिश. एम.के.पि MUNISH. M. K. P. अभियन्ता (गुणवत्ता नियंत्रण) Engineer (QC) इन्स्ट्रुमेंटेशन लिमिटेड INSTRUMENTATION LIMITED (भारत सरकार संस्थान) (A GOVT. OF INDIA ENTERPRISE) गेट नं. 14, भाग 1, प्लॉट 623, पलक्काड, केरला, भारत K.M. ROAD, GATE NO. 14, PLOT 623, PALAKKAD, KERALA, INDIA	NTPC (Reviewed / Approved by / Date & Seal)

FORMAT No.: QS-01-QAI-P-10/F5-R0

conf/Endorsement Sheet NTPC (NTPC) 5/10/2016

ANNEXURE-1**LIST OF ITEMS**

SL NO	TAG NO	VALVE MODEL	SERVICE	VALVE SIZE	RATING (ANSI #)
1	ASV-8	VSN (HT)	D/A PEGGING FROM AUX. STEAM HEADER	10"	300#
2	CRHV-6	VSN(HT)	D/A PEGGING FROM CRH LINE	10"	600#
3	CDV-10,12 & 14	VHD (A)	CEP A/B/C MIN. RECIRCULATION	6"	300#
6	CDV-22 & 25	VSC(M)	MAIN CONDENSATE CONTROL	14"	300# Spl
8	CDV-39	VHD(A)	GSC MIN. FLOW RECIRCULATION	6"	300#
9	CDV-43	VHD(A)	EXCESS RETURN TO CST	6"	300#
10	CDV-72	VSL(CAS)	CONDENSATE FOR VALVE GLAND SEALING	1"	300#
11	DRV-2 & 8	VSC	HPH-7A/7B NORMAL DRAIN TO HPH-6A/6B	6"	600#
13	DRV-5 & 11	VSC	HPH-7A/7B ALT. DRAIN TO F/T	6"	600#
15	DRV-15 & 22	VSC	HPH-6 NORMAL DRAIN TO DEAERATOR	6"	300#
17	DRV-18 & 25	VSC	HPH-6A/6B ALT. DRAIN TO F/T	6"	300#
19	DRV-28	VSC	LPH-3 NORMAL DRAIN TO LPH-2	6"	300#
20	DRV-31	VSC	LPH-3 ALT. DRAIN TO F/T	6"	300#
21	DRV-34	VSC	LPH-2 NORMAL DRAIN TO LPH-1	8"	300#
22	DRV-37	VSC	LPH-2 ALT. DRAIN TO F/T	8"	300#
23	DRV-48	VSC	DEAERATOR OVERFLOW TO F/T	6"	300#
24	DRV-53 & 59	VSC	HPH-8A/8B NORMAL DRAIN TO HPH-7A/7B	4"	900#
26	DRV-56 & 62	VSC(HT)	HPH-8A/8B ALT. DRAIN TO F/T	4"	900#
28	DRV-65	VSC	LPH-4 NORMAL DRAIN TO LPH-3	3"	300#
29	DRV-68	VSC	LPH-4 ALT. DRAIN TO F/T	4"	300#
30	DMV-43	VSC	NORMAL DM MU TO CONDENSATE TANK	3"	300#
31	DMV-78	VSC	EMERGENCY DM MU TO CONDENSATE TANK	6"	300#
32	PGC20AA101	VSC	DMCW SYSTEM - TG AUX.	8"	300#
33	PGC50AA101	VSC	DMCW SYSTEM - SG AUX.	4"	300#

Receipt No : 301299/2024/PS-PEM-S&CE

Manufacturer's Name & Address :- INSTRUMENTATION LTD KANJIKODE WEST PALAKKAD-678823		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC			
ITEM : CONTROL VALVE (Pneumatic operated - Modulating type - Refer NOTE 1)		Q.P. No. RQP-01	REV. No. : 0	DATE : 08.11.09	SIGNATURE : EAPIN VARGHES	AGM/CC :	Q.P. NO. : 000-PN-CV-P-027	REV. NO. & DATE : 08/11/09	VAL. DUPTO : 08/11/02	REVIEWED BY : D.P. Nair	APPROVED BY : A.K. Datta
SUB SYSTEM :		PAGE 1 of 3									
Sl No	Component & Operations	Characteristics	Class	Type of check	Quantum of check	Acceptance	Format of record	Agency			
1	2	3	4	5	6	7	8	9	10	11	
1	RAW MATERIAL AND BOUGHT OUT ITEMS										
1.1	Body and Bonnet, (Casting/ Forgings), Plug, Stem, Actuator Stem and Seat Rings	a) Physical and Chemical Properties	Maj.	Physical and Chemical Tests	1/ Heat (HT Batch)	1/ Heat (HT Batch)	Tech. Specification/ Approved Drawing	Tech. Specification/ Approved Drawing	TC	✓	P V V
		b) Heat Treatment	Maj.	Review of HT chart	Each HT	Each HT	Tech. Specification/ Approved Drawing	Tech. Specification/ Approved Drawing	TC	✓	P V V
		c) Internal Quality of casting	Maj.	RT for Body and UT for Bonnet	100%	100%	ANSI B 16.34	ANSI B 16.34	TC	✓	P V V
		d) Surface Quality	Maj.	Visual	100%	100%	MSS SP 55	MSS SP 55	TC	✓	P V V
		e) Pressure Test for Shell	Maj.	Hyd. Test	100%	100%	ANSI B 16.34	ANSI B 16.34	TC	✓	P V V
											Refer NOTE : 2
1.2	Diaphragm	a) Surface Quality	Maj.	Visual	100%	-	Mfr. Standard	Mfr. Standard	TC	✓	P V -
		b) Hardness	Maj.	Measu.	100%	-	Mfr. Standard	Mfr. Standard	TC	✓	P V -
		c) Endurance/ Life	Maj.	10,000 Cycles	1/ Type	-	10,000 Cycles / As per Mfr. Standard	No Damage	TC	✓	P V -
1.3	Springs	a) Composition	Maj.	Chemical	1 sample/lot	1 sample/lot	Material Spec./ Mfr. Std.	Material Spec./ Mfr. Std.	TC	✓	P V -
		b) Mechanical Properties	Maj.	Mech.	1 sample/lot	1 sample/lot	Material Spec./ Mfr. Std.	Material Spec./ Mfr. Std.	TC	✓	P V -
		c) Dimension	Maj.	Measu.	1 sample/lot	1 sample/lot	Mfr. Std.	Mfr. Std.	TC	✓	P V -
		d) Performance	Maj.	Stiffness Ratio	100%	100%	Approved Drg./ Material Spec.	Approved Drg./ Material Spec.	TC	✓	P V -
		e) Endurance Test	Maj.	Cyclic Test (Endurance)	1/ Type	1/ Type	Approved Drg./ Material Spec.	Approved Drg./ Material Spec.	TC	✓	P V -
1.4	Functional test (Limit switches, Solenoids, Positioner, AFR, & Position nominator)	a) Routine Test	Maj.	HV, IR and Continuity	100%	100%	Mfr. Standard	Mfr. Standard	TC	✓	P V -
		b) Type tests	Maj.	Review of TC	1/ Type	1/ Type	Mfr. Standard	Mfr. Standard	TC	✓	P V -
		c) Degree of protection	Maj.	Review of TC	1/ Type	1/ Type	Mfr. Standard	Mfr. Standard	TC	✓	P V -
		d) Functional Test	Maj.	Verification of Operation	-	-	-	-	-	✓	V V V
											During Final Testing
1.5	Pressure Gauge	a) Performance	Maj.	Review of Calibration TC	100%	100%	Mfr. Standard	Mfr. Standard	TC	✓	P V -
		d) Marking and Dimension	Maj.	Visual	100%	100%	Approved Drg./ Tech. Spec.	Approved Drg./ Tech. Spec.	TC	✓	P V -

LEGEND * RECORDS IDENTIFIED WITH * SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION
M-MANUFACTURER/ SUB SUPPLIER C-MAIN SUPPLIER, N-NTPC, P-PERFORM, W-WITNESS and V-VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLUMN "N" AS "W". ADS - Approved Data Sheet, TC - Test Certificate, TR - Test Records

Note : NTPC Inspection Engineer to check, approval dated revision no. of reference documents at the time of inspection

Format No : (QS-4)-QALP-1071-R0

Engr. Div/QA & I

Receipt No : 301299/2024/PS-PEM-S&CE

Manufacturer's Name & Address :		REFERENCE QUALITY PLAN						TO BE FILLED IN BY NTPC			
 INSTRUMENTATION LTD KANJIKODE WEST PALAKKAD-678523		ITEM : CONTROL VALVE (Pneumatic operated - Modulating type - Refer NOTE 1)		QP No. RQP-01	REV. No. 0	DATE: 09/11/09	EP NO: 2006-999-OVI-P-027	REVIEWED BY: O P Niranjan	APPROVED BY: S Samanta		
		SUB SYSTEM :		PAGE 2 of 3		VALID UPTO: 04/11/12		PP Path			
		Class		Type of	Quantum of check	Acceptance	Format of	Agency			
		No	Operations		check	M	C/N	Document	Norms	record	M G N
1	2	3	4	5	6	7	8	9	10	11	
3.4	Final Inspection	a) Overall Dimension	Mea.	Measu.	100%	10%	Approved Drawings	Approved Drawings	TR	P W W	
		b) Cleanliness and Stamping	Mea.	Visual	100%	100%				P V .	
		c) Painting	Mea.	Measu.	100%	-	Spec/ADS	Spec/ADS	TR	P - .	
NOTE : 1 - All pneumatic operated control valves up to 2000 Class & up to 600 MW except 500 MW BFP Recirculation valve. NOTE : 2 - Only for rating class 900 & above and applicable for Body and Bonnet only. Valve stem for dia > 40 MM UT shall be done on 100 % basis as per ASTM A-288 A and ASME B 16.34. For lower rating as per specification. M/s BHEL to mentioned in the endorsement sheet if any changes are made in the NDT requirement as per specification. NOTE : 3 - A) Air Filler regulator to be procured from M/s Plaka and M/s Shavonogen. B) Smart Positioner (if applicable) to be procured from Siemens, Yokogawa, ABB, Dressor, Fisher, Simar, Masclanien. C) All other bought out items/ accessories are procured from Valve Manufacturer approved sources. NOTE : 4 - IBR Certificate in Form III C shall be submitted if called for in the specification/ Data Sheet. NOTE : 5 - Copies of all TC for materials duly correlated with Heat numbers, TC for electrical items and mechanical tests (Leak/ Operation) shall be furnished to BHEL for verification and acceptance.											
LEGEND : * RECORDS, IDENTIFIED WITH * V* SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION M: MANUFACTURER/ SUB SUPPLIER C: MAIN SUPPLIER, NTPC, P: PERFORM, W: WITNESS and V: VERIFICATION AS APPROPRIATE, "CHP" NTPC SHALL INDICATED IN COLUMN "N" AS "W", ADS - Approved Data Sheet, TC - Test Certificate, TR - Test Records							Note : NTPC Inspection Engineer to check, approval date/ revision no. of reference documents at the time of inspection				
Format No. QS-01-QALP-10F1-R0							Enag. Div/QA & I				

ILP 012

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024
PACKING REQUIREMENT - Minimum requirement of packing specified herewith, any superior packing can also be acceptable		
Sl.no	DESCRIPTION	
1	Type of Packing:	
1.1	Item shall be fully covered with multi layered cross laminated colourless polyethylene sheet of at least 100 GSM and shall be packed inside wooden box or crate or fixed on wooden pallet depending upon the size.	
1.2	Item shall be firmly fixed to the bottom of the packing box/crate/pallet with the help of supports/blocks to arrest the movement from all sides.	
1.3	The electronic items like positioner and other delicate items like pressure gauges etc. shall be disassembled and packed separately in polyethylene air bubble film or black foam prior to placing in wooden boxes. Instructions with sketch for mounting the Smart Positioner & Pressure Gauge shall be sent along with the packing list for erection at site.	
1.4	Loose items/accessories like nipples, expander/reducer, root valves etc. shall be separately packed with polyethylene sheet of at least 100 GSM inside the packing box/crate.	
1.5	Threaded connection of Smart Positioner & Pressure Gauge shall be shipped with the end caps fitted to avoid any damage. Corrosion inhibitors are to be applied on all unpainted carbon steel surfaces.	
1.6	Marking for Fragile & Condensing environment shall be done on the packing box.	
2	Quality of wood:	
2.1	Quality of wood: Wood used for packing box shall be Pinewood, Rubber wood, Mango wood, Fir wood, Silver Oak wood or other as per availability with moisture content not exceeding 30%.	
3	Cushioning material and moisture absorber:	
3.1	Suitable cushioning shall be provided by rubberized coir/ expanded soft polyethylene foam.	
3.2	Adequate quantity of packed desiccant shall be suitably placed inside the packing box.	
4	Packing slip & holder:	
4.1	Packing slip kept in polyethylene bag shall be placed inside the wooden box at appropriate place.	
4.2	One copy of packing slip wrapped in polyethylene bag covered in galvanized iron tin sheet/ aluminium packing slip holder shall be fixed on the external surface the packing box.	

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024

DOCUMENTATION REQUIREMENT

DRAWINGS & DOCUMENTS TO BE SUBMITTED BY ALL THE BIDDERS ALONG WITH THE BID	
Sl. No.	DOCUMENT TITLE
1	COMPLIANCE SHEET

	TECHNICAL SPECIFICATION CONTROL VALVE AND ITS ACCESSORIES NORTH KARANPURA STPP (3 x 660 MW)	PE-TS-405-145-H111
		Rev. No. 00
		Date : 10.05.2024

COMPLIANCE CERTIFICATE	
1	It is hereby confirmed that the technical specification (sheet 1 to 25) has been read and understood. We confirm compliance to the tender specification including any prebid clarification and amendments issued prior to techno-commercial bid opening without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked by BHEL in NIT shall not to be considered as part of bid and shall not be evaluated by BHEL.

Signature of authorised Representative

Name and Designation :

Name & Address of the Bidder

Date