



उत्पाद मानक

STEAM TURBINE ENGINEERING  
PRODUCT STANDARD

ST47025  
HW0690097

पृष्ठ 4 का 1

Page 1 of 4

SUPERSEDES  
INVENTORY NO.

सामग्री सूची संका को  
अधिकृत किया है

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स्वाधिकार एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है। इसका प्रयोग एवं आरक्षण इस से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।

हस्ताक्षर एवं दिनांक  
SIGN & DATE

26.7.04


सामग्री सूची संका INVENTORY  
NO.




P-5522


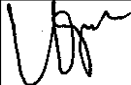
GENERAL PURCHASE SPECIFICATION OF VALVES

- 1.0 SCOPE :-** This specification covers the general technical requirements for all valves to be used in turbine integral system handling hot condensate, superheated steam, air steam mixture, steam water mixture, oil & oil vapours, fire resistant fluid & its vapours. Separate specifications to indicate specific requirements e.g. design parameters, nominal size etc. have been prepared for each valve which shall be enclosed with this specification whenever any requirement arises.
- 2.0 RATING :-** Rating of the valves shall be selected by valve supplier for the working conditions as specified in separate specification / documents / drawings / enquiry of desired valve to which specification is enclosed. The rating shall be as per ANSI B16.34 or approved equivalent.
- 3.0 END CONNECTION**
- 3.1** Butt weld end connections of valves shall be suiting to pipe size as mentioned in enclosed specification of valve.
- 3.2** In case of flanged end valves, the supplier shall separately quote for the counter flanges, gaskets, O-ring & fastners of required pressure-temperature rating.
- 4.0 MATERIAL :-** All materials used in the construction of the valve body and other component shall be selected from the best available material for the purpose. The purchaser / owner reserves the right to review the material specification of valve components and to ask changes in selection of material. Any specific material for particular valve has been mentioned in the valve specification.
- 5.0 DRAINAGE OF VALVE BODY :-** Depending on the construction and placement of the valve in piping system, a drain tapping in the body may be required for valves used in oil, steam and water lines. This shall be checked and intimated by purchaser / owner after the receipt of offer or at the time of placement of order. The tapping shall be at the lowest point and on the center line, which shall be suitably plugged with a threaded plug & washer. The drain size for various valve sizes shall be as follows:-
- NB50 to 100 - 15 mm  
NB125 to 300 - 20 mm  
NB350 & above - 25 mm
- 6.0**
- Each valve shall be marked with an arrow on body showing direction of flow of medium, not applicable for gate valve which can be mounted with either of the sides.
  - Handwheel shall have the indication for opening & closing direction.

				नाम NAME	दिनांक एवं हस्ताक्षर SIGNATURE & DATE
			अनुवादक TRANSLATED BY		
TSX	D.L. OBEROI		निर्माणकर्ता WORKED BY	S.K. GUPTA	26.7.04
QAX	S.S. CHAUHAN		जांचकर्ता CHECKED BY	V.K. GUPTA	26.7.04
सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता SUPERVISED BY	V.K. GUPTA	26.7.04
			स्वीकृति APPROVED :		
			निर्माण PREPARED : STE	जारी ISSUED : STE (TL) HARDWAR	दिनांक DATE : 26.3.84

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST47025 HW0690097	
				पृष्ठ 4 का 2 Page 2 of 4	
सामग्री सूची संख्या को अधिकृतित करता है	SUPERSEDES INVENTORY NO.	<p>3. <b>GLAND SEALING</b> :- Valves working under vacuum are to be provided with gland sealing arrangement.</p> <p>7.0 <b>HYDRAULIC TEST</b> :- Hydraulic test shall be carried out on each valve. After the hydraulic test the internals shall be wiped, cleaned and dried. The body &amp; seat shall be tested hydraulically in accordance with ANSI B16.34. For steam &amp; air service valves, seat leakage shall additionally be tested by air as per ANSI B16.34. Purchaser/owner shall have the right to witness the test. However the test certificates mentioning about test pressure &amp; duration of test along with following informations shall be furnished to purchaser.</p> <ol style="list-style-type: none"> <li>Valve identification No.</li> <li>Type of valve &amp; description</li> <li>Valve size</li> <li>Name of manufacturer</li> <li>Project name</li> <li>Date of testing</li> </ol> <p>8.0 <b>CLEANING &amp; SURFACE PROTECTION</b> :- The surfaces shall be rubbed with a solvent (e.g white spirit) to clean &amp; prepare them for the application of the paints. Unmachined surface shall be blast cleaned to remove any rust. Stainless steel portion shall not be painted.</p> <ol style="list-style-type: none"> <li>Outer surface to be protected by painting with two coats of Red oxide Zinc chromate primer.</li> <li>Inside surface to be protected against rusting and corrosion.</li> </ol> <p>9.0 <b>IDENTIFICATION PLATE</b> :- Following information in English shall be engraved on a metal sheet properly fixed at a convenient location on the body or body cover.</p> <ol style="list-style-type: none"> <li>Identification No. as specified in enclosed valve specification.</li> <li>Valve type &amp; Description</li> <li>Valve size</li> <li>Pressure rating</li> <li>Manufacturer</li> <li>Year of manufacturing</li> <li>Project name</li> </ol>			
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		स्वत्ताधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है। इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।			
दिनांक एवं हस्ताक्षर SIGN & DATE	26.7.04	REV. NO. 02			
सामग्री सूची संख्या INVENTORY NO.	P-5522	निर्माणकर्ता WORKED BY		S.K.GUPTA	9/7/04
		जांचकर्ता CHECKED BY		V.K.GUPTA	9/7/04

दिनांक एवं हस्ताक्षर SIGN & DATE			<p style="text-align: center;"><b>उत्पाद मानक</b></p> <p style="text-align: center;"><b>STEAM TURBINE ENGINEERING</b></p> <p style="text-align: center;"><b>PRODUCT STANDARD</b></p>		<p><b>ST47025</b> HW0690097</p> <p><b>पृष्ठ 4 का 3</b> Page 3 of 4</p>		
सामग्री सूची संख्या को अधिकृतित करता है	SUPERSEDES INVENTORY NO.	<p><b>10.0 STANDARD :-</b> Latest issue and amendments of all applicable international standard shall apply.</p> <p><b>11.0 PACKING :-</b> Valve ends, machined and unmachined surface, etc. shall be protected against rusting &amp; corrosion and valve shall be packed according to mode of transport and storage in top shade store gantry in tropical climatic conditions for a period of 8-12 months.</p> <p><b>12.0 GUARANTEE :-</b> The supplier shall guarantee trouble free operation of the equipment for a period of 2 years after installation and commissioning or a period of 3 years from the date of dispatch of equipment whichever is earlier.</p> <p style="padding-left: 40px;">If during erection/commissioning and operation at site, any defect in any component is detected, purchaser's / owner's site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace / rectify the concerned items free of charge. The supplier, if he so desires, may depute his representative to site at his own cost otherwise the report of purchaser's / owner's site representative shall be binding on the supplier.</p> <p><b>13.0 SPARES :-</b> The offer of valves shall include the requirement of spares to be made available at the time of erection &amp; commissioning. A separate offer of spares to be required for 3 to 5 years of operation shall also be separately enclosed along with main offer.</p> <p><b>14.0 SPECIAL TOOLS &amp; TACKLES :-</b> Any special tools &amp; tackles, required for erection, commissioning and maintenance of valves shall be included in main offer per set of valves.</p> <p><b>15.0 QUALITY ASSURANCE, INSPECTION AND TESTING :-</b></p> <p><b>15.1</b> The manufacturer shall conduct all tests required to ensure all the component parts of the valve offered conform to the requirements of the specification and in compliance with requirements of applicable codes and standards.</p> <p><b>15.2</b> The bidder shall submit along with his offer quality plan in the prescribed BHEL's format.</p> <p><b>15.3</b> The particulars of the proposed shop tests and procedures for the tests shall be submitted to the BHEL / owner for approval along with quality plan.</p> <p><b>15.4</b> The equipment shall be dispatched only after inspection and clearance of material by BHEL / owner and approval of test certificates by BHEL / owner.</p> <p><b>15.5</b> The minimum tests/ checks to be carried out on the valve as envisaged by purchaser shall be as per the specification of desired valve to which this specification is enclosed. This is , however not intended to form a comprehensive testing programme as it is supplier's responsibility to prepare the detailed quality plan, which should also include tests, checks carried out by supplier as a part of their normal practice. This quality plan is subject to the approval of BHEL and owner. BHEL/owner reserves the right to ask for any more checks at the time of quality plan finalisation.</p>					
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<b>स्वत्वाधिकार एवं गोपनीय</b> इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयुक्त एवं आगेका रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में अनुकारक हो न किया जाए।							
हस्ताक्षर एवं दिनांक SIGN & DATE	26.7.04						
सामग्री सूची संख्या INVENTORY NO.	P-5522	REV. NO. 02		निर्माणकर्ता WORKED BY	S.K.GUPTA		9/7/04
				जांचकर्ता CHECKED BY	V.K.GUPTA		9/7/04

SIGN दिनांक एवं हस्ताक्षर	SIGN & DATE		<b>उत्पाद मानक</b> <b>STEAM TURBINE ENGINEERING</b> <b>PRODUCT STANDARD</b>		<b>ST47025</b> <b>HW0690097</b>	
					<b>पृष्ठ 4 का 4</b> <b>Page 4 of 4</b>	
सामग्री सूची संख्या INVENTORY NO.	समग्री सूची संख्या को अधिकारित करता	<b>SUPERSEDES INVENTORY NO.</b>	<p><b>16.0 ACTUATORS :-</b> As mentioned in valve specification, separately enclosed with this specification, the actuators shall be supplied along with handwheel to facilitate manual operation of valve. Direction of rotation of handwheel for opening and closing of valve shall be indicated on handwheel.</p> <p><b>17.0 DOCUMENTS</b></p> <p><b>17.1 Documents required along with the offer / at the time of registration :-</b> The supplier shall submit 6 copies of following documents in English language along with the offer to enable purchaser for complete technical scrutiny of the offer.</p> <ol style="list-style-type: none"> <li>1. Cross sectional &amp; dimensional drawing of valve along with actuator ( if required ) in assembled condition giving items nos. description, material specification of all components, details of bypass valve ( if envisaged ), gland sealing arrangement, end connection details, clear space required for operation &amp; dismantling of valve &amp; actuator for maintenance for approval by the purchaser.</li> <li>2. Quality plan for approval by purchaser.</li> <li>3. List of commissioning spares, maintenance spares for 3 to 5 years of operation for reference.</li> <li>4. Any special requirements of lubricant for reference.</li> </ol> <p>The document submitted along with the offer at the time of registration and approved by purchaser / owner shall be the basis of the order and no changes shall be made with out permission of purchaser / owner.</p> <p>Scrutiny and approval of documents, submitted along with the offer, by purchaser / owner shall not release the supplier and his sub-vendors of their responsibility under the contract .</p> <p><b>17.2 Documents to be submitted after placement of the order :-</b></p> <ol style="list-style-type: none"> <li>1. 10 copies of finalised contract drawing within 8 weeks.</li> <li>2. 10 copies operation/ maintenance/ erection instructions for each station within 12 weeks.</li> <li>3. Instruction of conservation and deconservation within 12 weeks.</li> </ol> <p><b>18.0</b> Six copies of all actual test certificates and quality documents shall be furnished to purchaser/owner.</p> <p><b>19.0</b> If there are any deviation from this specification in offer, the same shall be clearly spelled out clausewise by supplier.</p> <p><b>20.0</b> Cross referred standards :- ANSI B16.34</p>			
<b>सामग्री सूची संख्या</b> <b>INVENTORY NO.</b>	<b>हस्ताक्षर एवं दिनांक</b> <b>SIGN &amp; DATE</b>	<b>जांचकर्ता</b> <b>CHECKED BY</b>	<b>V.K.GUPTA</b>	 <b>9/7/04</b>		

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**स्वत्वाधिकार एवं गोपनीय**

इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।

**26.7.04**

**P-5522**

### Own Experience





TECHNICAL SPECIFICATION OF NON-RETURN VALVES  
FOR LUBE OIL AND FIRE RESISTANT FLUID VAPOUR  
EXHAUST LINE.

This specification covers design, manufacturing assembly, testing and supply of Non-return valves as per sketch 1.0 to be installed in turbine lube oil and FHF vapour exhaust line with identification number as tabulated below:

SL. NO.	Identification Number.	Size No	Flow medium	Working Parameters	End connection
1	MAV82AA001	125	Sorvo	Pressure	To be
2	MAV82AA002	125	-prime	2 kg/cm <sup>2</sup>	fitted
3	MAV82AA002	80	46 of	abs.	between
			IOC	Temp.	flanges
			Fire	70°C	as per
			resis-		DIN 2633
			tant		
4	MAV82AA003	80	Fluid		
			(Phosp-		
			oric		
			ester)		

These valves are to be installed on main oil tank and F&F tank after each vapour exhausters to prevent back flow of vapours in case one vapour exhauster is under maintenance.

INVENTORY NO. P-5515	REVISION : 02			Distribution	Qty.	Approved :  ENGG. DEV. MANAGER	ST 8.20
	Name	Sign	Date				
	S.K. Gupta		12.2.08				
	Reaffirmed Feb. 2008						
SIGN & DATE Jg 15/5/04	AGREED.			DRAWN	WORKED	NAME	SIGN. & DATE
	TSX	B.M. BANSAL	B.M. 24.3.84				
	QAX	H.C. PADHYA	H.C. 9.3.84				
	DEPTI	NAME	SIGN. & DATE				
				SUPERVISED	S.S. KULKARNI	19.3.84	



**PRODUCT STANDARD**

**STEAM TURBINE ENGINEERING**

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**SUPERSEDES**  
**INVENTORY No.**


SIGN &amp; DATE

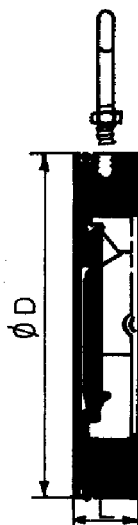
**SIGN & DATE**

INVENTORY No.

1575704

P-5515



- 3.0 RATING : Nominal pressure rating = 16 kg/cm<sup>2</sup>
- 4.0 MATERIAL *flap of Aluminium*   
Body of Carbon steel, *other* Material of *other* internals to be selected  
by supplier and to be informed to purchaser for their  
comments, if any. Also refer clause 4.0 of ST 47025.  
All gaskets shall be of VITON.
- 2.0 END CONNECTIONS
- Valves are to be fitted between flanges as per  
DIN 2633.
- 6.0 SPECIAL FEATURE:
- Maximum permissible pressure drop across the valve  
at sl.Nos. 1 & 2 with 0.11 m<sup>3</sup>/sec flow of air shall  
be 60 mmwc and across the valve at Sl.Nos. 3 & 4  
with 0.02 m<sup>3</sup>/sec flow of air shall be 20 mmwc.
- 7.0 For completion of this specification, read this  
specification along with general purchase specification  
of valves ST 47025.



SKETCH-1

NOM. DIA.	DIM.IN MM		WT APPX IN K.G.
MM.	$\frac{1}{2}$	D	K.G.
80	24	134	1.80
100	27	154	2.50

Revision: 02

SIGN & DATE			PRODUCT STANDARD		ST 47034
SIGNATURE			STEAM TURBINE ENGINEERING		PAGE 3 OF 3
SUPERSEDES INVENTORY No.		<p>8.0 In continuation to clause 15.0 of Specification ST 47025, the min. test requirement envisaged by BHEL are as follows:-</p> <p>8.1 <u>Testing of Materials:</u> The material of components of valve such as body &amp; disc shall be tested as per relevant specification for its chemical composition and mechanical properties. For remaining components compliance certificate shall be furnished.</p> <p>8.2 DPT on seat.</p> <p>8.3 Functional test. <i>smooth movement of the flap.</i> </p>			
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SIGN & DATE		<p>REVISION: 02</p>			
INVENTORY No.					

**ADDENDUM TO ST47025****APPLICATION : STEAM TURBINE****Date : 16.11.2011****ITEM : GENERAL SPECIFICATION OF VALVES****Rev : 01****ADDITIONAL SPECIFICATION :**

- a) Pressure retaining parts of valves shall be subjected to NDT as per Table-I.
- b) Bar stock / forging above 50mm diameter for valve trim shall be subjected to UT.
- c) Hardened / stellited valve disc and seat are to be subjected to LPI and hardness check.
- d) Colour matching of valve disc / plug and seat shall be carried out to ensure contact.
- e) Hydraulic pressure test and seat leak test shall be carried out as per ANSI 16.34.
- f) Air seat leak test shall be carried out as per applicable standards / codes.
- g) Functional testing shall be carried out on each valve to check the following as per the approved valve data sheet :
  - (i) Smooth operation
  - (ii) Valve travel, closing and opening time
  - (iii) Current drawn by actuators
- h) Springs for safety valves shall be tested with suitable NDT and for spring rate.
- i) Safety and safety relief valves shall be tested for performance.

**TABLE-I**

Valve Size NB in mm	ANSI Class UPTO 300	ANSI Class ABOVE 300 UPTO 600	ANSI Class ABOVE 600 BELOW 900	ANSI Class 900 & ABOVE & BELOW 4500
Less than 50	Visual	Visual	Visual	MPI
50 & above but below 100	Visual	Visual	MPI	MPI & RT (on 10% of valves on 100% area)
100 & above but less than 300	Visual	MPI	MPI & RT (on 10% of valves on change of section & weld ends)	MPI & RT (on 100% area)
300 & above	MPI	MPI	MPI & RT (on change of section & weld ends)	MPI & RT (on 100% area)

**NOTE :** 1. For body and bonnet forgings UT with MPI may be adopted in place of RT.

2. For austenitic steel MPI may be replaced by LPI.

3. Outer surface of valve shall be painted as per following painting scheme



Paint (Coat - air less)

Paint Type

No. of coat DFT\*

Primer Paint : Epoxy base Zinc rich primer paint (IS:14946)

1 Coat 75

Intermediate Paint : Epoxy MiO Polyamide Cured Paint

1 Coat 100

Finish (Final) Paint : Aliphatic Acrylic Polyurethane Finish paint

1 Coats 50

Total DFT 225 (microns)



Stainless Steel Surfaces shall not be painted in general.

The painting environment shall be considered as C-4 as per ISO 12944.

SHADE AS PER RAL/IS:5 IS GREY 9002

This supersedes clause 8 (i) of ST47025.

4. Valve made of stainless steel shall not be painted.

5. Valve body material for the following temperature parameter shall be as follows :-

Upto 400°C - Carbon steel

401°C - 495°C - Alloy steel ( 15Mo3 or equivalent )

496°C - 550°C - Alloy steel ( 10CrMo910 or equivalent )

Above 550°C - Alloy steel ( X10CrMoVNb9-1 or equivalent )

6. Each type of Angle Drain valve (MAL valves) and Temperature control valve offered should have a minimum of two years of operational experience in similar application at the time of offer submission.

  
(S.K.Gupta)

QAX, BHEL, HARDWAR

PED, BHEL, HARDWAR

**BHARAT HEAVY ELECTRICALS LIMITED, HARIDWAR**

STE-TL ENGINEERING DEPARTMENT

**PRE-QUALIFICATION REQUIREMENT****NRV WITH ALUMINIUM FLAP**

DOCUMENT NO.

TL/NRV/PQR/20200002

Rev:00 Dt:13.11.2021

**Description:**

These valves are single plate (Material-aluminium) type valve and are installed in horizontal run of pipe after each vapour exhauster to prevent the backward flow of air+steam mixture in case of vapour exhauster is under maintenance.

**Mandatory requirement for Pre-Qualification:**

1. The vendor should have successfully designed, manufactured, tested & supplied of NRV with aluminum flap valves. Vendor should have supplied one (1) no. in at least one power or process plants in last seven (7) years from the date of issuance of enquiry with following technical details mentioned in table-1.

**Table-1**

Valve Type	Single Plate Check/NRV Valve
Valve Size Range	NB200 & above
Body Type	Wafer
Valve Rating	CL150 & above as per ASME B16.34 or equivalent
Valve Body Material	Cast Steel-A216Gr.B or higher grade
Flow Medium	Air+Steam Mixture

2. The vendor should furnish the following documents in line with criteria given in above sl.no.1.
  - a. Executed unpriced Purchase order (P.O.) should not be older than seven (7) years from the date of issuance of enquiry.
  - b. Dispatch document w.r.t above executed P. O. i.e. Approved valve GA drawing & data sheet, Delivery challan, Tax invoice, Inspection report & Lorry way bill for our review.
  - c. Those who have supplied above mentioned valve to BHEL-HARIDWAR to furnish only P.O. ref. for our review.

**Note: -**

1. BHEL reserves the right to verify the information submitted by vendor. Submission of false/incorrect information shall lead to rejection of offer.
2. BHEL reserves the right to ask for more pertinent information /documents / clarifications. Vendor shall provide this information to BHEL in a timely manner so that project schedule doesn't hamper.
3. All the documents furnished to BHEL shall be in Hindi/English language only. If the documents are not in Hindi/English, then they must be accompanied with duly certified Hindi/English translations of the same.

<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>
SUNIL KR. SHARMA Dy. Engineer/TL <i>Sunil Sharma</i> 13.11.21	ANIL KUMAR Sr. Engineer/TL <i>Anil kumar</i> 18/11/21	S.K SONKAR Sr. Manager/TL <i>Sankar</i> 18/11/2021

QUALITY PLAN										Page 1 of 2		
BHEL	QP NO.	QA_BI_QP_117		REV.	00	DESCRIPTION			LEGENDS			
	SPEC. NO.	AS PER PO		REV.	AS PER PO				P- PERFORMED BY		1- BHEL REP	
	DRG. NO.	APPROVED DRAWING AS PER PO		REV.	AS PER PO	W- WITNESSED BY		2- VENDOR				
							V- VERIFIED BY		3- SUBVENDOR			
SL. NO	COMPONENT OPERATION	CHARACTERISTICS	CLASSIFI- CATION	TYPE OF CHECK	QUANTUM	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									P	W	V	

1	MATERIAL											
1.1	BODY, DISC	CHEMICAL COMPOSITION MECHANICAL PROPERTIES	MAJOR	CHEMICAL  MECHANICAL	1 / HEAT	ORDERING SPEC. / BHEL APPD. DRG.	ORDERING SPEC. / BHEL APPD. DRG.	MILL TC	3/2	-	2/ 1	
		SURFACE DEFECTS	MAJOR	VISUAL	100%	MSS-SP-55	MSS-SP-55	TC	2	-	1	
		DIMENSIONS	MAJOR	MEASUREMENT	100%	BHEL APPD. DRG.	BHEL APPD. DRG.	TC	2	-	1	
2. IN PROCESS INSPECTION												
2.1	MACHINING OF BODY, DISC	DIMENSIONS	MAJOR	MEASUREMENT	100%	BHEL APPD. DRG.	BHEL APPD. DRG.	IR	2	-	-	
		SURFACE DEFECTS	MAJOR	DPT	100%	ASTM E165 ASME B16.34	ASME B16.34	TC	2	-	1	
2.2	HARD FACING ON DISC & SEAT	HARDNESS	MAJOR	HARDNESS	10%	BHEL APPD. DRG.			2	-	1	IF CALLED IN DRAWING
3	FINAL INSPECTION											
3.1	ASSEMBLY OF VALVE	DIMENSIONS	MAJOR	MEASUREMENT	100%	BHEL APPD. DRG.	BHEL APPD. DRG.	TC	2	1		
3.2	FUNCTIONAL TEST	SMOOTH OPERATION OPENING & CLOSING	MAJOR	OPERATION	100%	SMOOTH OPERATION OF VALVE		TC	2	1*		* 10% (MIN. 2 NO.)
3.3	HYDRAULIC TEST	LEAKAGE	CRITICAL	HYDRAULIC	100%	ORDERING SPEC. / BHEL APPD. DRG	NO LEAKAGE	TC	2	1*	-	* 10% (MIN. 2 NO.)

MANUFACTURER/ SUBCONTRACTOR		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY

QUALITY PLAN									Page 2 of 2			
BHEL	QP NO.	QA_BI_QP_117	REV.	00	DESCRIPTION				LEGENDS			
	SPEC. NO.	AS PER PO	REV.	AS PER PO	NRV WITH ALUMINIUM FLAP				P- PERFORMED BY		1- BHEL REP	
	DRG. NO.	APPROVED DRAWING AS PER PO	REV.	AS PER PO					W- WITNESSED BY		2- VENDOR	
									V- VERIFIED BY		3- SUBVENDOR	
SL. NO	COMPONENT OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
.									P	W	V	
3.4	SEAT LEAK TEST	LEAKAGE	CRITICAL	HYDRAULIC	100%	ORDERING SPEC. / BHEL APPD. DRG	NO LEAKAGE	TC	2	1*	-	* 10% (MIN. 2 NO.)
3.7	PRESERVATION & PAINTING		MAJOR	VISUAL	100%	BHEL SPEC		IR	2	-	-	

		LEGEND:	FOR CUSTOMER USE	
MANUFACTURER/ SUBCONTRACTOR		! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY