



उत्पाद मानक

STEAM TURBINE ENGINEERING
PRODUCT STANDARD

ST47025
HW0690097

पृष्ठ 4 का 1

Page 1 of 4

SUPERSEDES
INVENTORY NO.

सामग्री सूची संकाय 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


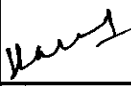
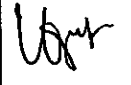
सामग्री सूची संकाय INVENTORY
NO.




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 SUPERSEDES INVENTORY NO.	<p>3. GLAND SEALING :- Valves working under vacuum are to be provided with gland sealing arrangement.</p> <p>7.0 HYDRAULIC TEST :- Hydraulic test shall be carried out on each valve. After the hydraulic test the internals shall be wiped, cleaned and dried. The body & seat shall be tested hydraulically in accordance with ANSI B16.34. For steam & 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 & duration of test along with following informations shall be furnished to purchaser.</p> <ol style="list-style-type: none"> Valve identification No. Type of valve & description Valve size Name of manufacturer Project name Date of testing <p>8.0 CLEANING & SURFACE PROTECTION :- The surfaces shall be rubbed with a solvent (e.g white spirit) to clean & 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"> Outer surface to be protected by painting with two coats of Red oxide Zinc chromate primer. Inside surface to be protected against rusting and corrosion. <p>9.0 IDENTIFICATION PLATE :- 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"> Identification No. as specified in enclosed valve specification. Valve type & Description Valve size Pressure rating Manufacturer Year of manufacturing Project name 				
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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				
सामग्री सूची संख्या INVENTORY NO.	REV. NO. 02	निर्माणकर्ता WORKED BY	S.K.GUPTA		9/7/04
P-5522		जांचकर्ता CHECKED BY	V.K.GUPTA		9/7/04

दिनांक एवं हस्ताक्षर SIGN & DATE			<p style="text-align: center;">उत्पाद मानक</p> <p style="text-align: center;">STEAM TURBINE ENGINEERING</p> <p style="text-align: center;">PRODUCT STANDARD</p>		<p>ST47025 HW0690097</p> <p>पृष्ठ 4 का 3 Page 3 of 4</p>		
सामग्री सूची संख्या को अधिकृत करता है	SUPERSEDES INVENTORY NO.	<p>10.0 STANDARD :- Latest issue and amendments of all applicable international standard shall apply.</p> <p>11.0 PACKING :- Valve ends, machined and unmachined surface, etc. shall be protected against rusting & 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>12.0 GUARANTEE :- 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>13.0 SPARES :- The offer of valves shall include the requirement of spares to be made available at the time of erection & 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>14.0 SPECIAL TOOLS & TACKLES :- Any special tools & tackles, required for erection, commissioning and maintenance of valves shall be included in main offer per set of valves.</p> <p>15.0 QUALITY ASSURANCE, INSPECTION AND TESTING :-</p> <p>15.1 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>15.2 The bidder shall submit along with his offer quality plan in the prescribed BHEL's format.</p> <p>15.3 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>15.4 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>15.5 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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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

<div>सामग्री सूची संख्या INVENTORY NO. P-5522</div>		<div>हस्ताक्षर एवं दिनांक SIGN & DATE 26.7.04</div>		<div>स्वत्वाधिकार एवं गोपनीयता The information on this document 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.</div>		<div>सामग्री सूची संख्या को अधिकारित करता SUPERSEDES INVENTORY NO.</div>		<div>दिनांक एवं हस्ताक्षर SIGN & DATE</div>	
REV. NO. 02				निर्माणकर्ता WORKED BY S.K.GUPTA		जांचकर्ता CHECKED BY V.K.GUPTA		9/7/04 9/7/04	

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 / stellitted 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

Painting Scheme

Paint (Coat)	Paint Type	No. of coat	DFT*
Primer Paint	: Epoxy base Zinc rich primer paint	1 Coat	35
Intermediate Paint	: Epoxy TiO ₂ Pigmented Polyamide Cured Paint	1 Coat	70
Finish (Final) Paint	: Aliphatic Acrylic 2 Pack Polyurethane Finish paint	2 Coats	75
Total DFT		180	

DFT – Dry Film Thickness (final) in microns.

- Shade as per RAL – Grey 9002
- Identification Tag/Band of white 9010 color. Legend in Black letters.

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 :-


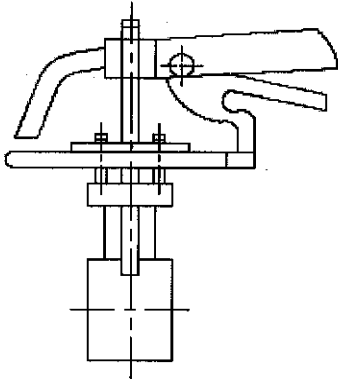
- Upto 400°C - Carbon steel
- 401°C - 495°C - Alloy steel (15Mo3 or equivalent)
- 496°C - 550°C - Alloy steel (10CrMo910 or equivalent)
- Above 550°C - Alloy steel (X10CrMoVNb9-1 or equivalent)



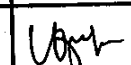
6. Each type of Angle Drain valve (MAL valves) and Temperature control valve offered should have a minimum of two years of operational experience in similar application at the time of offer submission.


(S.K.Gupta)

QAX, BHEL, HARDWAR

PED, BHEL, HARDWAR

		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST47031	
				पृष्ठ 2 का 1 Page 1 of 2	
SUPERSEDES INVENTORY NO.		TECHNICAL SPECIFICATION OF BUTTERFLY VALVE 1.0 SCOPE :- This specification covers design, manufacturing, assembly, testing and supply of butterfly valves to meet the service condition given in the specification. 2.0 COMPLIANCE WITH STANDARDS:- 2.1 Based on BHEL experience. 3.0 FUNCTION :- The valves are intended to regulate the flow of steam air mixture / lub. oil vapour / FRF vapour in turbine integral piping system. Some of the valves are used for isolation purpose and require leak tightness. For guidance of supplier a sketch of the valve in use is given below:-  4.0 RATING :- Rating of the valve is to be selected by the supplier as per the working parameters mentioned below and clause 2.0 of specification No. ST47025. <div style="border: 1px solid red; padding: 5px; margin: 5px;"> 1. Air Steam Mixture (MAW System) 1 kg / cm² & 350°C </div> <div style="border: 1px solid red; padding: 5px; margin: 5px;"> 2. Vapour of Turbine oil ISO VG46 (Servo prime 46 of IOC or equivalent) (MAV System) 3 kg / cm² & 65°C </div>			
सामग्री सूची संख्या को अधिकारिता करता है।					
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हस्ताक्षर एवं दिनांक SIGN & DATE					
सामग्री सूची संख्या INVENTORY NO.		दिनांक एवं हस्ताक्षर SIGNATURE & DATE			
P-5526		7.8.04			
TSX		S.NATH		अनुवादक TRANSLATED BY	
QAX		S.S.CHAUHAN		निर्माणकर्ता WORKED BY	
सहमत विभाग AGREED DEPTT.		नाम NAME		जांचकर्ता CHECKED BY	
दिनांक एवं हस्ताक्षर DATE & SIGNATURE		पर्यवेक्षणकर्ता SUPERVISED BY		V.K.GUPTA	
स्वीकृति APPROVED :		29/7/04		जारी : ISSUED : STE (TL) HARDWAR	
REV.NO. 01		PREPARED : STE		DATE : 19-03-90	
Dt. 29.07.04					

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD	ST47031	
			पृष्ठ 2 का 2 Page 2 of 2	
सामग्री सूची संख्या को SUPERSEDES INVENTORY NO.	3. Vapour of Phosphate Ester (Fire resistant fluid) (MAX System) :- <div style="border: 1px solid red; padding: 5px; margin: 5px 0;"> 3 kg / cm² & 65°C </div> <p>Identification No., quantity & size of the valves are dependent on project requirement and shall be given in enquiry.</p>			
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.	5.0 MATERIALS <p>Cast iron parts are not acceptable. Valve body of spheroidal cast iron (GGG) as per IS:1865 or cast steel A216 Gr.B are acceptable. The material of disc, stem, bush, gland packing, sealing and other parts shall be selected by the supplier suitable for the working condition and shall be reviewed by the purchaser.</p>			
	6.0 END CONNECTIONS <p>Valve shall be suitable to be assembled between flanges of PN16 DIN2633.</p>			
	7.0 MODE OF OPERATION <p>Valve shall be manually operated by a hand lever which should have the provision of locking in intermediate position.</p>			
	8.0 STANDARDS & TESTING <p>The valve shall generally conform to National/International standard on these type of Butterfly valves. For completion of this specification, read this specification alongwith ST47025. In continuation to clause 15 of ST47025 the minimum test requirement envisaged by BHEL are as follows :-</p>			
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में जो गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह उपयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	1. MATERIAL TESTING <p>The material of components of valve such as body & disc shall be tested as per relevant specification for its chemical composition and mechanical properties. For remaining components, compliance certificates shall be furnished.</p>			
हस्ताक्षर एवं दिनांक SIGN & DATE	2. Function test :- Smooth opening and closing.			
सामग्री सूची संख्या INVENTORY NO.	9.0 Cross referred standards: ST47025, IS:1865, DIN2633.			
REV. NO. 01	निर्माणकर्ता WORKED BY	S.K.GUPTA		29/07/09
P-5526	जांचकर्ता CHECKED BY	V.K.GUPTA		29/07/09

PAINTING SCHEME

DOC. NO.: HW-DG-445-COM-A001

Item / Assembly Description	Shade as per IS-5 or Eq.s	Temp in Celsius	Surface Preparation	Coating systems	No. of coats	Paint type	Dry film thickness (DFT) per coat micro m	Total DFT (Micro m)	Final Paint Shade	Place of Painting W (at BHEL works), V (at vendor works), S (at site) and NA (Not applicable)	Remark
Valves of Turbine Integral Piping	Grey 9002		Manual wire brush/emery paper/Solvent cleaning	Primer	2	Epoxy base Zinc rich primer paint	35	70	-	V	Identification Tag/Band of White 9010 colour. Legend in black letters.
				Intermediate	1	Epoxy TiO2 Pigmented Polyamide Cured Paint	70	70	-	V	
				Finish	2	Aliphatic Acrylic 2 Pack Polyurethane Finish paint	30	60	Grey	V	
								200		Touch up at site	