

Note No. #1

Attachment:PR DOCS – MAIN –1900141226-FRAME WORK-CAST IRON BUTTERFLY VALVES.pdf

FRAMEWORK AGREEMENT FOR FGD FPS PROJECTS

R00 -06.11.2021

Un-Priced Price Bid Format

Item: CI BUTTERFLY VALVE

PR No: 1900141226

Sl No	PR No	Material Code	Material Description	UOM	PR Qty (No.s)	Technical Specification	Price Weightage Factor	Bidder Confirmation (Quoted)
1	1900141226	PY9752148018	3" BFLV CI (FG 260) HO PN16 WAFER LUG	EA	8	PY52148	0.00719	
2	1900141226	PY9752148026	4" BFLV CI (FG 260) HO PN16 WAFER LUG	EA	700	PY52148	0.83932	
3	1900141226	PY9752148034	6" BFLV CI (FG 260) HO PN16 WAFER LUG	EA	35	PY52148	0.06409	
4	1900141226	PY9752156037	150NB BUTTERFLY VALVE STEM	EA	15	PY52156	0.00549	
5	1900141226	PY9752156096	150NB BUTTERFLY VALVE SEAL RING	EA	15	PY52156	0.00412	
6	1900141226	PY9752156150	150NB BUTTERFLY VALVE DISC	EA	15	PY52156	0.00549	
7	1900141226	PY9752156215	150NB BUTTERFLY VALVE BEARING	EA	15	PY52156	0.00549	
8	1900141226	PY9752156029	100NB BUTTERFLY VALVE STEM	EA	75	PY52156	0.01799	
9	1900141226	PY9752156088	100NB BUTTERFLY VALVE SEAL RING/SEAT	EA	75	PY52156	0.01349	
10	1900141226	PY9752156142	100NB BUTTERFLY VALVE DISC	EA	75	PY52156	0.01799	
11	1900141226	PY9752156207	100NB BUTTERFLY VALVE BEARING	EA	75	PY52156	0.01799	
12	1900141226	PY9752156193	80NB BUTTERFLY VALVE BEARING	EA	2	PY52156	0.00036	
13	1900141226	PY9752156134	80NB BUTTERFLY VALVE DISC	EA	2	PY52156	0.00027	
14	1900141226	PY9752156070	80NB BUTTERFLY VALVE SEAL RING	EA	2	PY52156	0.00036	
15	1900141226	PY9752156010	80NB BUTTERFLY VALVE STEM	EA	2	PY52156	0.00036	
Total							1.00000	

NOTES:

- 1) Vendor to Quote Lumpsum Price for the Total Package.
- 2) Line Item Rates of the individual items shall be derived by multiplying the "Price Weightage Factor" with the Lumpsum Price quoted.
- 3) Unit Rates of the Individual items thus arrived, shall be binding on the bidder, for the total period of Framework Agreement.
- 4) Observations / Objections, if any, of the Bidder, to the "Price Weightage Factor" shall be brought to the notice of BHEL, during Pre-Bid Stage.
- 5) No Observations / Objections shall be entertained after the Techno-Commercial Bid is opened.
- 6) Bidder to indicate "Quoted" in the column "Bidder's Confirmation" as a confirmation of their bid to the respective item.
- 7) The Bid Evaluation is on Overall L1 Basis. Each and Every item of the Package shall be quoted by the bidder.
- 8) Partial offers will not be considered for evaluation and the same are liable for rejection.
- 9) The details of the Projects for which Framework Agreement is proposed are given elsewhere in the NIT. The distribution of the line items across the projects is attached as **Annexure-A**.
- 10) The permissible ordering limits specified in NIT are strictly applicable on the Total Framework Value. The same are not applicable at the Individual Project level.
- 11) The Total Lump price quoted shall be INCLUSIVE of Freight, Packing & Forwarding and Testing Charges.
- 12) The Total Lump price quoted shall be EXCLUSIVE of GST, Third party inspection (TPI) & Insurance Charges.

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DISTRIBUTION OF FRAMEWORK ITEMS ACROSS PROJECTS

Annexure-A to Price Bid Format

ITEM: CI BUTTERFLY VALVE

PR NO 1900141226

SL NO	Material No	Material Desc	UOM	PMD No	UWT	KOTHAGUDEM	BHADRAORI	NORTH KANANPURA	BARH-1	BARH-2	MAUDA	BRBCI NABINAGAR	NGCL NABINAGAR	RAMAGUNDAM	KORBA	NSPL BILLAI	TUTICORIN	UDANGUDI	SAGARDIGHI	ENMORE	BHUSAWAL	YADADRI	PATRATU	PANU	CONTINGENCY
1.00	PY9752148018	3" BFLV CI (FG 260) HO PN16 WAFER LUG	EA	PE.MP.554															8						
2.00	PY9752148026	4" BFLV CI (FG 260) HO PN16 WAFER LUG	EA	PE.MP.554		8	8	22	22	18	16	22	22	22	22	16	8	151					618		
3.00	PY9752148034	6" BFLV CI (FG 260) HO PN16 WAFER LUG	EA	PE.MP.554		1	1	0	2	2	2	0	0	0	0	2	1	22					16		
4.00	PY9752156037	150NB BUTTERFLY VALVE STEM	EA	PE.MP.554																					15
5.00	PY9752156096	150NB BUTTERFLY VALVE SEAL RING	EA	PE.MP.554																					15
6.00	PY9752156150	150NB BUTTERFLY VALVE DISC	EA	PE.MP.554																					15
7.00	PY9752156215	150NB BUTTERFLY VALVE BEARING	EA	PE.MP.554																					15
8.00	PY9752156029	100NB BUTTERFLY VALVE STEM	EA	PE.MP.554																					100
9.00	PY9752156088	100NB BUTTERFLY VALVE SEAL RING/SEAT	EA	PE.MP.554																					100
10.00	PY9752156142	100NB BUTTERFLY VALVE DISC	EA	PE.MP.554																					100
11.00	PY9752156207	100NB BUTTERFLY VALVE BEARING	EA	PE.MP.554																					100
12.00	PY9752156193	80NB BUTTERFLY VALVE BEARING	EA	PE.MP.554																					2
13.00	PY9752156134	80NB BUTTERFLY VALVE DISC	EA	PE.MP.554																					2
14.00	PY9752156070	80NB BUTTERFLY VALVE SEAL RING	EA	PE.MP.554																					2
15.00	PY9752156010	80NB BUTTERFLY VALVE STEM	EA	PE.MP.554																					2

1. The quantities indicated are total quantity with additional 50 % qty variation considered

2. The above list of Quantity , project/customer is tentative only. Final details of quantity, Project/ Customer shall be informed at the time of PO

3. The Project/ Customer are subject to change based on buisness scenario of BHEL.

Attachment: PR DOCS – MAIN 1900141226 FRAME WORK CAST IRON BUTTERFLY VALVES.pdf
BUCK PROCUREMENT OF GENERIC PIPING ITEMS
Pre-Qualification Criteria (Technical)

Package Name : CI BUTTERFLY VALVE
PR No : 1900141226

Manufacturers of **CAST IRON BUTTERFLY VALVE** qualified as per the Pre-qualification criteria laid down below, are allowed to bid. Documentary evidence shall be provided by such bidders to establish their claim. **However, offer consideration is subjected to approval from end Customer.**

The bid evaluation shall be on Overall L1 basis. The Bidder shall meet the Pre-Qualification Criteria (listed below).

Non-compliance to any of the criteria listed below will lead to disqualification of bidder for the subject item of the tender.

Qualification Criteria of the Bidder:

1. The bidder should be an established manufacturer of **Cast Iron Butterfly Valve** and should have successfully completed Manufacture, Supply of **Cast Iron Butterfly Valve**.
2. The Bidder should have successfully completed supply of **Cast Iron Butterfly Valve** for similar specification with a total minimum quantity of **500 No.s** (Sizes in the range of 80NB to 150 NB) through a single Purchase Order or multiple Purchase Orders in the last 5 years ending on original due date of this tender, with at least one order executed after 01.01.2019.
3. Detailed BOQ of the items supplied, satisfying the criteria laid down above, shall be provided in the format enclosed as Annexure-1, with details like Project & Customer, Description & Quantity of Items supplied, PO details etc. as a minimum for assessing pre-qualification. **PO Copies, Inspection Reports and Dispatch documents shall be enclosed for the references provided.**
4. The bidder should not have been under suspension for business or blacklisted by any of the BHEL units.

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Annexure-1 PQC Criteria**Supply References for the Last 5 Years (dispatch date) from the Original due date of this tender**

Enquiry Item No & Description: (To be filled by Bidder)

Sl No	Project Name along with name of Customer	Description Item(s) supplied	Purchase Order No & Date (Copy to be enclosed)	Delivery Date as per Order	Value of Order	Inspection Reports / Dispatch Documents (Copy to be enclosed)	Remarks

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Bulk Procurement of CI BUTTERFLY VALVE
Price Variation Formula – Cast Iron Butterfly Valve
PVC-CI-BFLV

$$PO = PA \times \left(\left[0.60 \times \frac{MO}{MA} \right] + \left[0.15 \times \frac{FO}{FA} \right] + \left[0.10 \times \frac{LO}{LA} \right] + 0.15 \right)$$

PO	Purchase Order Value, adjusted in accordance with above Price Variation Formula
PA	Purchase Order Value, as per Original Framework Agreement Price

Escalation for Raw Material:

MO	JPC Retail Market Price of “PIG IRON”, as on the date of respective Project PO Placement, <i>calculated as an Average of the Prices for Kolkata, Delhi, Mumbai, Chennai regions.</i>
MA	JPC Retail Market Price for “PIG IRON”, as on the date of Part-1 bid opening of Framework Agreement Tender, <i>calculated as an Average of the Prices for Kolkata, Delhi, Mumbai, Chennai regions.</i>
As published under the Item “ PIG IRON ” by Joint Plant Committee, Ministry of Steel, Govt of India, in their subscription based bimonthly publication “JPC MARKET PRICE RETAIL”.	

Escalation for Fuel & Power:

FO	Wholesale Price Index for “Fuel & Power”, as on the date of respective Project PO Placement
FA	Wholesale Price Index for “Fuel & Power”, as on the date of Part-1 bid opening of Framework Agreement Tender
As published under the Index “ II Fuel & Power ” by Office of the Economic Adviser, Ministry of Commerce and Industry, Govt of India, on their website www.eaindustry.nic.in	

Escalation for Labour:

LO	All-India Average Consumer Price Index Number for Industrial Workers (Base_2016=100), as on date of respective Project PO Placement
LA	All-India Average Consumer Price Index Number for Industrial Workers (Base_2016=100), as on the date of Part-1 bid opening of Framework Agreement Tender
As published by Labour Bureau, Ministry of Labour and Employment, Govt of India, on their website www.labourbureau.gov.in	

Overheads and Margin:

0.15	Constant for Overheads and Margin
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NOTE: Latest Index Values, as published by respective agencies, **Available as on the date** of Part-1 bid opening of FA Tender / date of PO, shall be considered, for all the factors.

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VENDOR'S NAME & ADDRESS:		TYPICAL MANUFACTURING QUALITY PLAN						QAP. NO.:						
		CUSTOMER: BHEL, HYDERABAD -32.			BHEL P.O.NO.:			REV NO:		DATE:				
		PROJECT:			P.O.DATE:			PAGE 1 OF 5						
PRODUCT: CI BUTTERFLY VALVE			BHEL SPEC:			REV:								
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY				REMARKS
									D	P	W	V		

1.0	RAW MATERIALS & BOUGHT OUT ITEMS											
1.1	Body	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat	BHEL Spec / Appd Drawing / Appd Datasheet/ BS EN 593/ BS EN 12266 -3	MTC	✓	2	2	1&3	
1.2		Surface defects and Hardness	Major	Visual , Hardness test	100%, One per Melt / Heat		TC	✓	2	2	1&3	
1.3	Disc	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat		MTC	✓	2	2	1&3	
1.4		NDE	Critical	RT & LPT	As per Spec		NDE Report	✓	2	2	1&3	
1.5		Heat treatment, IGC	Major	Heat treatment and IGC testing	per Heat		TC	✓	2	2	1&3	
1.6	Shaft & Body seat ring, disc retaining ring	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat		MTC	✓	2	2	1&3	
1.7		Heat treatment, IGC	Major	Heat treatment and IGC testing	per Heat		MTC	✓	2	2	1&3	
1.8		Hardness	Major	Hardness test	One per Melt / Heat		TC	✓	2	2	1&3	
1.9		Internal defects	Critical	UT & LPT	100%		NDE Report	✓	2	2	1&3	UT for Dia ≥ 40mm

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL / BHEL NOMINATED INSPECTION AGENCY, 2 FOR VENDOR / SUB VENDOR & 3 FOR END USER AS APPROPRIATE AGAINST EACH COMPONENT / CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D' TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY	APPROVED BY	APPROVED BY
	VENDOR'S SIGNATURE & STAMP	BHEL QA SIGNATURE & STAMP	CUSTOMER'S SIGNATURE & STAMP

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									PAGE 2 OF 5				
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS
									D	P	W	V	
1.10	Fasteners (Bolt, Nut, Stud, Eye Bolt etc.)	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Heat	BHEL Spec / Appd Drawing / Appd Datasheet/ BS EN 593/ BS EN 12266 -3		MTC	✓	2	2	1&3	
1.11		Visual, Dimensions, Heat Treatment, Type, Hardness etc.	Major	Visual & Measure. Hardness Test	100% & One per Heat			TC	✓	2	2	1&3	
1.12	Accessories Like Gear / Hand Wheel / Actuator	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2	2	1&3	
1.13		Make, Model & Operation	Major	Visual & Functional	100%			TC	✓	2	2	1&3	
1.14	Actuator#	Type test, Routine test	Major	Test	100%			TC	✓	2	2	1&3	# if applicable
1.15	Actuator#	Ingress Protection, CCOE approval, Ex. proof	Critical	Type Test	100%			TC	✓	2	2	1,3	# if applicable
1.16	GASKETS#	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2	2	1&3	# if applicable
1.17		Dimensions, Rating, Type etc.	Major	Visual	100%			MTC/TC	✓	2	2	1&3	
1.18	BEARING	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2	2	1&3	

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		PROJECT:			P.O.DATE:			PAGE 3 OF 5					
		PRODUCT: CI BUTTERFLY VALVE			BHEL SPEC:			REV:					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										P	W	V	
1.19	RUBBER LINER	Visual	Major	Visual	100%			IR	✓	2	2	1&3	
1.20		Ozone Resistance Test in accordance with ASTM D 1149	Major	Test	1 per batch			TC	✓	2	2	1&3	
1.21		Volume Expansion Test in accordance with ASTM D 471	Major	Test	1 per batch			TC	✓	2	2	1&3	
1.22		Spark test	Major	Test	100%			TC	✓	2	2	1&3	
2.0	INPROCESS INSPECTION												
2.1	Valve	LPT on Seating Surfaces, Butt Welding Ends of Valves	Major	LPT	100%	BHEL Spec / Appd Drawing / Appd Datasheet/ BS EN 593/ BS EN 12266 -3		ITR	✓	2	2	1&3	
2.2	Machining of Body, Disc, Shaft	Surfaces finish, Dimension	Major	Visual, Measurement	100%			IR	✓	2	2	1&3	
2.3		NDE	Critical	LPT-Other	100%			NDE Report	✓	2	2	1&3	ASME E165
3.0	FINAL INSPECTION & TESTING												
3.1	VALVE	Visual, Dimensions, BOM	Major	Visual, Measurement	100%	BHEL Spec / Appd Drawing / Appd Datasheet / IBR/ BS EN 593/ BS EN 12266 -3		IR	✓	2	1&3		10% shall be witnessed by 1&3 Refer Note: 8
3.2		Hydro Test on Body, Seat	Major	Hydro test	100%			IR	✓	2	1&3		

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PREPARED BY

APPROVED BY

APPROVED BY

VENDOR'S SIGNATURE & STAMP

BHEL QA SIGNATURE & STAMP

CUSTOMER'S SIGNATURE & STAMP

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		PROJECT: PRODUCT: CI BUTTERFLY VALVE			P.O.DATE: BHEL SPEC: REV:				PAGE 4 OF 5				
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
3.3		Operation/Functional Test with Actuator#	Major	Functional	100%			ITR	✓	2	1&3		# if applicable
3.4		Name Plate check/Tag No	Critical	Visual & Doc.Verify	100%			IR	✓	2	1&3		
3.5		Fire Safe Test#	Critical	Fire Safe test	100%			TC	✓	2		1&3	# if applicable
3.6		IBR Certificate#	Critical	Doc. Verify	100%			IBR Certificate	✓	2		1&3	# if applicable
3.7	SPARES FOR VALVE	BOM & TC	Major	Visual & TC review	100%			TC	✓	2	1&3	-	
4.0	PRESERVATION & PACKING												
4.1		Surface Preparation	Major	Visual & Match Card	100%			Log Book	✓	2	2	1&3	
4.2	VALVE ASSEMBLY	Painting (Shade, DFT), Markings	Major	Visual, Measurement	Random	BHEL Spec / Appd Drawing / Appd Datasheet		IR	✓	2	1&3	-	Flow Direction etc.
4.3		Preservation	Major	Visual	100%			ITR	✓	2	2	1&3	
4.4		Packing	Major	Visual	100%			Packing List	✓	2	2		
4.5	Quality Documentation & Certification	QAP clause no. wise with page numbers on each page	Major	Verification	100%	All relevant documents as per this QAP (✓ in column D)		Index format	✓	2		1&3	Refer Note: 8

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									D	P	W	V	

Notes: -

1. This Standard MQP should be read along with specification (Latest revision as per PO), approved drawings & approved datasheet (as applicable).
2. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.
3. Approved drawing/datasheet & specification shall prevail over quality plan in case contradiction if any.
4. Material test certificate shall include tensile, impact, hardness, bend, IGC, hot tensile, grain size, chemical analysis etc. as required by applicable material code /approved drawing / data sheet.
5. Hydro test shall be done in un-painted condition as per approved procedure/relevant code.
6. Any other tests/ checks indicated in specification, P.O., or drawing/data sheet & any additional checks envisaged by BHEL/Customer as part of correspondence to ensure workmanship, finish, aesthetics, etc. shall also be conducted and witnessed/verified by BHEL /TPIA /Customer as per project requirement.
7. All documents issued by statutory authorities such as CCOE, IBR, CMRI, ATEX etc., shall be submitted during inspection.
8. All the relevant test reports /certificates shall be submitted during inspection. The reviewed and certified documents by BHEL/TPIA/Customer shall be submitted (QAP clause no. wise with page numbers on each page) to BHEL as documentation package.
9. All sub-ordered items, bought out items, electrical & instrumentation Items as applicable shall be procured from approved / agreed vendor list with BHEL/BHEL's Customer.
10. All lab reports shall be from NABL accredited lab.

Abbreviations: -

MTC - Mill Test certificate	TC - Test Certificate	IR - Inspection Report
ITR - Internal Test Report	NDE - Non Destructive Examination	IGC - Inter Granular Corrosion
LPT - Liquid Penetrant Test	IBR - Indian Boiler Regulations	DFT - Dry Film Thickness

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RC PURAM, HYDERABAD.
QUALITY & BUSINESS EXCELLENCE

INSPECTION / TC REVIEW FORMAT

1	Vendor's Name:		5	Applicable BHEL Spec No:	
2	Project:		6	Approved Drawing No:	
3	PO No:		7	Approved Data Sheet No:	
4	Item Description:		8	Approved QAP No:	

OFFER LIST

S.No	BBU/ PO Sr. No.	Item Description	Total Qty as per PO/BBU	Qty. already accepted	Qty offered for TC review	Cumulative Qty	Balance Qty
A							
B							
C							
D							

TC REVIEW REQUISITION

BBU / PO Sr. No.	QAP Clause No.	Format of Record	Certificate No. & Date	Page No.	REMARKS
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A. Item Description:

B. Item Description:

C. Item Description:

D. Item Description:

E. Item Description:

SUPPLIER / VENDOR SIGNATURE WITH SEAL


BHEL/ BHEL's TPIA SIGNATURE WITH SEAL

Dt:

Dt:

Format No: PESD/QA/10, Rev: 00


Attachment: PR DOCS MAIN 1900141226 FRAME WORK CAST IRON BUTTERFLY VALVES.pdf

TD-201 Rev No. 00	Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE Rev No. 00 Page 1 of 3
<div style="text-align: center;"> <p>QAP GUIDELINES & FORMAT</p> <p>(ANNEXURE)</p> </div> <p>The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement.</p> <p>Note:</p> <ol style="list-style-type: none"> 1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of QAP for BHEL /CUSTOMER approval. 2. No deviation to reference document is acceptable. 				


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Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE
			Rev No. 00
			Page 2 of 3
<p style="text-align: center;"><u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u></p> <ol style="list-style-type: none"> QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10. Each page of QAP shall contain the following information. <ol style="list-style-type: none"> Vendor's name & address. Customer: BHEL, Hyderabad. Project. BHEL Product Standard Number/revision number as referred in P.O. BHEL Purchase Order Number & Date. Product as per P.O. description. QAP Number (unique and shall not repeat)/revision number/date. Page number and number of pages QAP shall contain four parts / stages as follows. <ol style="list-style-type: none"> Raw materials and bought out items. In process Control / Inspection. Final assembly, Inspection & Testing. Painting, preservation & packing. Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc). Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT, DP etc.), hydrostatic test, calibration check etc.) Under 'Class', indicate minor, major or critical depending on the importance of characteristic. Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.) Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.) Under 'Reference document' and 'Acceptance norms', appropriate National & International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review & approval by our Engineering dept. Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc. Please refer 'Agency' in QAP format. Under P: Perform, W: Witness, V: Verify Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR 2: (Vendor / Sub vendor) 			
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"> COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company. </p>			
Ref. Doc			

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Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE Rev No. 00 Page 3 of 3
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p>Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where witness points are indicated in specification, P.O., Drawing etc., for such operations, Under Witness (W) column use 1. Under 'Verify' column, use code1.</p> <p>12. Under 'D' please put (☐ Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification.</p> <p>13. Vendor's signature & stamp should be available on each page of QAP.</p> <p>14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification & Approved Drawings.</p> <p>15. The following operations/characteristics/check points may be included (AS APPROPRIATE)</p> <ol style="list-style-type: none"> Visual check Dimensional check Mechanical and Chemical properties. Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc. Check for correctness for all components mounted as per General Arrangement Drawing, Bill of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc. Verification of test certificate for protection class for the enclosures. Mechanical functioning of switches. Continuity of earthing and provision of earth points. Colour coding of wiring, size, tightness & dressing of wiring. Review of test certificates of assembled items, raw materials, internal test reports etc. Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc. PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc. Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non-Destructive Tests. Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole. Packing and Preservation. <p>16. QAP Format enclosed.</p>		
	Ref. Doc		

Attachment: PR DOCS – MAIN – 1900141226-FRAME WORK-CAST IRON BUTTERFLY VALVES.pdf	Form No:	 PE&SD	BHARAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING & SYSTEMS DIVISION TECHNICAL SPECIFICATION FOR BUTTERFLY VALVES (WAFFER/WAFFER LUG) WITH RESILIENT SEAT FOR WATER / AIR SERVICE				PY 52 148
			Rev. No. 10				
			Page 1 of 9				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p align="center">BUTTERFLY VALVES (WAFFER/WAFFER LUG) WITH RESILIENT SEAT FOR WATER / AIR SERVICE</p> <p>1. Scope This specification covers the design, manufacture, inspection, testing and supply of inching type concentric butterfly valves (WAFFER TYPE, WAFFER LUG TYPE) with resilient seat operated manually or through electrical / pneumatic actuator for water / air service applications.</p> <p>2. Codes and Standards</p> <p>2.1 The design, manufacture and testing of butterfly valves shall comply with the latest edition of BS EN 593. For other requirements like material grades of components, this specification has to be followed.</p> <p>2.2 This standard shall be supplemented by project specific requirements (if any) supplied along with the inquiry. In case of any conflict between codes, reference standards, specifications, technical delivery conditions and project specific requirements, the most stringent requirements shall govern. All conflicts shall be brought to the attention of BHEL for clarification and direction prior to manufacturing/supply of valves.</p> <p>2.3 Project specific requirements include(but not limited to) requirements other than those indicated in this specification, painting & surface preparation requirements, data sheets for limit switches & motor actuators, marking & packing requirements etc.,</p> <p>2.4 In general, no deviations to this specification are acceptable. In case of any deviations, bidder shall clearly indicate them in a separate document titled "TECHNICAL DEVIATIONS LIST" clearly indicating the deviations against respective clause number of this specification. Mere indication of deviations will not entitle bidder to supply the valves with deviations to this specification. Acceptance or rejection of these deviations will be at the sole discretion of BHEL</p> <p>2.5 Wherever superior design or material of construction is provided bidder shall provide necessary documentation supporting the same</p> <p>2.6 After the order placement, bidder shall obtain BHEL approval on valve GA drawing, motor actuator datasheet, limit switch data sheet, manufacturing quality plan and all relevant documents before starting manufacturing and procurement activities.</p> <p>3. Designation A 4" 150# Hand operated carbon steel wafer type concentric Butterfly valve to this standard shall be designated as follows: <i>4" BFLV CS HO CL150 WAFFER</i> A 4" 150# Motor operated carbon steel wafer type concentric Butterfly valve with integral starter to this standard shall be designated as follows: <i>4" BFLV CS MO IS CL150 WAFFER</i> A 4" 150# Hand operated carbon steel wafer type concentric Butterfly valve with Limit Switch to this standard shall be designated as follows: <i>4" BFLV CS HO CL150 WAFFER WITH LS</i></p>						
	Form No:	LAYOUT & PIPING ENGINEERING PROJECT ENGINEERING & SYSTEMS DIVISION	PREPARED	CHECKED	APPROVED	DATE	
CHMANOJ/ SVNR			GS	SBR	14.07.16		

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<div data-bbox="252 757 338 1742" style="writing-mode: vertical-rl; transform: rotate(180deg);"> COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company. </div> <div data-bbox="368 421 1422 1496"> <p>4. Design Requirements</p> <p>4.1 Type of Valve Valves are of concentric type (no offset) with resilient seat and zero leakage Valves covered under this standard are manually, pneumatically, hydraulically or electrically operated. Valve shall be supplied as per the description indicated against Material Code as per Variant Table-II.</p> <p>4.2 Operation</p> <ol style="list-style-type: none"> The butterfly valve shall be suitable for inching / regulating duty Manual valves up to 6" size should have valve handle with throttling plate for locking valve in 10 different positions. Gear operator shall be provided for butterfly valve size 8" and above with directly mounted actuators. Each manual actuator shall have all gearing totally enclosed. For valves with electric actuator, the electric actuator shall be as per datasheet at Table-I. Pneumatically operated valves should be mounted with spring return air actuator. <p>4.3 End Connection/Body Type</p> <ul style="list-style-type: none"> Shall be Wafer or Wafer Lug type as indicated in material description. For wafer lug type valves, valve shall be full lugged type and supplied with full lugs. Unless otherwise specified in variant table, the valve shall be suitable for connecting to a counter flange as per drilling standard of 150# as per ASME B16.5. In case of any different drilling standard like PN10 / PN16 (as per IS 8329) is required the same shall be informed by BHEL to vendor after order placement and during drawing approval stage. Vendor to provide the same without any cost/delivery implication. <p>4.4 Valve Size – As indicated against material code in the Variant Table-II</p> <p>4.5 Valve body rating – As indicated against material code in the Variant Table-II</p> <p>4.6 Material of construction:</p> <table border="1" data-bbox="373 1532 1417 1872"> <thead> <tr> <th>S.NO.</th> <th>Description</th> <th>(CS) - MATERIAL FOR CARBON STEEL VALVE BODY (A216 WCB)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Body</td> <td>(CS) CARBON STEEL AS PER A216 Gr WCB</td> </tr> <tr> <td>2</td> <td>Disc</td> <td>STAINLESS STEEL A351 Gr CF8M</td> </tr> <tr> <td>3</td> <td>Shaft</td> <td>SS AISI 410</td> </tr> <tr> <td>4</td> <td>Bearings</td> <td>Manufacturer STD</td> </tr> <tr> <td>5</td> <td>Seat</td> <td>EPDM Rubber</td> </tr> <tr> <td>6</td> <td>Gear Casing</td> <td>MFG STD</td> </tr> <tr> <td>7</td> <td>Gears</td> <td>MFG STD</td> </tr> <tr> <td>8</td> <td>Handle</td> <td>Malleable Iron only no alternate material allowed</td> </tr> <tr> <td>9</td> <td>Bolt/Nut</td> <td>ASTM A193 Gr.B7/ ASTM A194 Gr.2H</td> </tr> </tbody> </table> </div>					S.NO.	Description	(CS) - MATERIAL FOR CARBON STEEL VALVE BODY (A216 WCB)	1	Body	(CS) CARBON STEEL AS PER A216 Gr WCB	2	Disc	STAINLESS STEEL A351 Gr CF8M	3	Shaft	SS AISI 410	4	Bearings	Manufacturer STD	5	Seat	EPDM Rubber	6	Gear Casing	MFG STD	7	Gears	MFG STD	8	Handle	Malleable Iron only no alternate material allowed	9	Bolt/Nut	ASTM A193 Gr.B7/ ASTM A194 Gr.2H
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Attachment: PR DOCS – MAIN – 1900141226-FRAME WORK-CAST IRON BUTTERFLY VALVES.pdf Form No:	 PE&SD	BHARAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING & SYSTEMS DIVISION TECHNICAL SPECIFICATION FOR BUTTERFLY VALVES (WAFFER/WAFFER LUG) WITH RESILIENT SEAT FOR WATER / AIR SERVICE	PY 52 148
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S.NO.	Description	(SS) - MATERIAL FOR STAINLESS STEEL VALVE BODY (CF8M)
1	Body	(SS) STAINLESS STEEL AS PER A351 Gr CF8M
2	Disc	STAINLESS STEEL A351 Gr CF8M
3	Shaft	SS AISI 410
4	Bearings	Manufacturer STD
5	Seat	EPDM Rubber
6	Gear Casing	MFG STD
7	Gears	MFG STD
8	Handle	Malleable Iron only no alternate material allowed
9	Bolt/Nut	ASTM A193 Gr.B7/ ASTM A194 Gr.2H


S.NO.	Description	(CI) - MATERIAL FOR CAST IRON VALVE BODY (FG 260)
1	Body	(CI) CAST IRON as per IS-210 Gr. FG 260 + Epoxy
2	Disc	STAINLESS STEEL A351 Gr CF8M
3	Shaft	SS AISI 410
4	Bearings	Manufacturer STD
5	Seat	EPDM Rubber
6	Gear Casing	MFG STD
7	Gears	MFG STD
8	Handle	Malleable Iron only no alternate material allowed
9	Bolt/Nut	ASTM A193 Gr.B7/ ASTM A194 Gr.2H

4.7 Constructional Features: -

- The butterfly valve shall be of concentric type and suitable for Bi directional flow with zero leakage
- The butterfly valve shaft and disc shall be designed to withstand full differential pressure across the closed valve disc.
- For butterfly valves, the disc shall rotate from the full open to the tight shut position. The disc shall be contoured to ensure the least possible resistance to flow and shall be suitable for throttling operation. While the disc is in the throttled position, valve shall not create any noise or vibration. All butterfly valves shall be suitable for throttling application from 5 to 90 Deg. **i.e., by default, the valve shall be of Inching / regulating type.**
- The butterfly valves shall be suitable for indoor/outdoor installation with shaft either in horizontal or vertical position.
- Sleeve and other bearings fitted into the valve body shall be of self-lubricated materials shall not have any harmful effect on water or rubber and coefficient of friction of the material shall not exceed 0.25, when run at the maximum bearing pressure.
- All butterfly valves shall be closed by rotating the hand controls in the clockwise direction. The pulling force required on the hand wheel rim shall not exceed 25 kgf when operating the valve under full flow and operating pressure.
- Gear Operator shall be totally enclosed helical worm or combination of helical worm and spur gear in grease case with grease nipples / plugs with position indicators for open / close positions and with limit stops.
- Butterfly valve actuators shall be equipped with adjustable, mechanical, stop limiting devices to prevent over-travel of the valve disc in the open and closed positions.

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<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); padding: 5px; border: 1px solid black; margin-right: 10px;"> COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company. </div> <div> <p>i. Actuator, housings, supports and connections to the butterfly valve shall be designed with a minimum safety factor of 5, based on the ultimate tensile strength, or a minimum safety factor of 3, based on the yield strength of materials used.</p> <p>j. The actuator shall be designed to control the butterfly valve in all positions from fully open to fully closed and from fully closed to fully open with control in any intermediate position.</p> <p>k. For Pneumatically operated valves purchaser will provide ½” connection of airline with an isolation valve. All further required air filters & tubing to be supplied by valve supplier.</p> <p>l. The butterfly valve shall be provided with locking device in both open & close position of the valve.</p> <p>m. The indication of the position of the disc shall be integral with shaft engraved on the body of the valve. The indication may be accomplished by a mark on the shaft. The design shall ensure that it indicates open, close and intermediate position of the valve correctly. Shaft to lever connections shall be designed so that the lever always correctly indicates the disc position.</p> <p>n. Butterfly valve body shall be internally rubber lined extending upto the edges of the flanges without any joints and disc of the butterfly valve shall be coated with epoxy.</p> <p>o. Valve seats shall be of replaceable type.</p> <p>p. The rubber lining thickness shall be as per manufacturer’s standard. However, the minimum thickness shall be 3 mm.</p> <p>q. No reclaimed rubber shall be used.</p> <p>r. Necessary shaft seal shall be provided and adequately designed to ensure no leakage across the seal.</p> <p>s. Valves shall be of bi directional type and preferred direction of flow shall be marked on the valve body by stamping or embossing and the tag Nos. for all valves shall be either riveted or punched on the valve body.</p> <p>t. Fabricated type butterfly valves are not acceptable and No asbestos or cadmium-based material shall be used.</p> <p>u. Limit Switch requirement: As per the requirement indicated in material description for Hand operated or Gear operated valves, Limit switches 2No’s (Each for open and close end position) with minimum 1 No DPDT or 2 No SPDT contacts and with IP 67 protection shall be provided. For all Motor operated valves Limit switches shall be provided as per Table-1(technical data sheet electrical actuator of valve) of this specification. Project specific requirements if any shall be provided along with Enquiry and during drawing approval stage</p> <p>5. Testing</p> <p>a. Body test, Seat test and all other requirements of testing shall be as per BS EN 593 & BS EN 12266 (latest edition)</p> <p>b. All valve major material shall be tested for chemical and mechanical properties as per the relevant codes and standards.</p> <p>c. Performance test on valve with direct mounted actuator shall be operated three times from fully closed to fully opened position and the reverse under no flow conditions.</p> </div> </div>				

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company.		<p>d. Ozone resistance testing on rubber compounds shall be performed in accordance with ASTM D 1149 using 50 PPHM minimum ozone concentration. The tests shall be conducted on unstressed samples for 70 hrs. at 40 Deg.C without visible cracking in the surfaces of the test samples after tests.</p> <p>e. Volume expansion test on rubber compounds shall be performed in accordance with ASTM D 471. The rubber compound shall have less than 2% volume increase after immersing a sample in distilled water at 23 Deg.C + 1Deg.C for 70 hrs.</p> <p>f. Rubber lining shall be spark tested for checking the continuity, as applicable.</p> <p>g. Magnetic particle testing shall be carried out on disc and the trunnion portion.</p> <p>h. Ultrasonic testing and dye penetrant testing shall be carried out on shaft.</p> <p>6. Name Plate:</p> <p>Each valve shall be provided with 2mm thick SS nameplate with 1mm deep engraving filled with black enamel indicating the TAG NO. & service description etc. Name plate data shall be inscribed on the plate in such a manner that it cannot erode or peel off.</p> <p>7. Surface Preparation & Painting: -</p> <p>7.1 Shall be as per PEMC Document , Project Specific painting specification issued along with enquiry documents. Project specific requirements if any shall be provided along with enquiry</p> <p>7.2 Painting requirement shall be clearly indicated in the GA drawing issued for approval during detail engineering.</p> <p>8. Packing: -</p> <p>8.1 All the valves shall be packed suitably in closed wooden cases in order to avoid damage during transit and storage at BHEL. Suitable supports shall be provided inside the cases in order to avoid internal movement. In case of imported consignments the packing shall be seaworthy</p> <p>8.2 Each valve after end protection should be wrapped in polythene sheet before packing in the cases</p> <p>8.3 Valves of sizes up to 50mm (2") could be packed in one packing case taking care that they do not strike each other. Enough packing material shall be kept inside the case to avoid damage</p> <p>8.4 Valves of sizes above 50mm (2") shall be packed separately in each case, the hand wheel extension spindle or any other accessory of a valve is removed at the time of packing, the same must be kept in the same case and not separately.</p> <p>8.5 Each Packing case must contain 2 copies of the shipping list giving details of all the contents of the case.</p> <p>9. Marking</p> <p>The following marking shall be done on each packing case minimum on two sides and also at the top.</p> <ol style="list-style-type: none"> Complete address of the consignee and destination as per BHEL Purchase Order. BHEL Purchase Order Number. BHEL Valve Standard Number(s). Number of pieces in each packing case. Net weight. Gross weight. Packing case numbers and total number of packing. Arrow indicating top of the packing case. 		

Attachment: PR DOCS – MAIN – 1900141226-FRAME WORK-CAST IRON BUTTERFLY VALVES.pdf BHARAT HEAVY ELECTRICALS LIMITED PY 52 148	Form No:	 PE&SD	PROJECT ENGINEERING & SYSTEMS DIVISION TECHNICAL SPECIFICATION FOR BUTTERFLY VALVES (WAFFER/WAFFER LUG) WITH RESILIENT SEAT FOR WATER / AIR SERVICE
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10. Documentation

Bidder shall confirm in their bid for compliance in all respect for the submission of documents as follows:

S. No	Description	Along with offer	After placement of Order (Note-2)	After Supply completion
1	Filled in technical data sheets, GA Drg.	I (2)	A (4)	
2	Leaflet / catalogue for the offered item indicating complete cross sectional arrangement, binding dimensions, bill of materials with material specification details, hydraulic / air test pressure for body / seat / back seat, overall height, dismantling clearances, weight and special features, if any, as specified in the main specification of the valves.	I (1)		
3	Quality Assurance Plan (QAP)	I (1)	A (4)	
4	List of recommended spares for 2 years trouble free operation of valves		I (2)	
5	Any deviations to this standard	A (1)		
6	Actuator technical data sheet, wiring diagram, limit switch development diagram, if applicable	I (1)	A (3)	
7	Test Certificate		I (5)	
8	Guarantee Certificate		I (2)	
9	Installation, operation and maintenance manual (with all approved drawings, data sheets, write-ups, safety procedures, catalogues, list of spares, lubrication schedule etc),		A (2)	F (12)


Notes:

- 1) I: For Information, A: For Approval
F: All above documents shall be made as 'FINAL' and submitted both in hard copies and 2 no's of CDs.
- 2) After placement of PO, all documentations required as applicable in above table shall be submitted within 7 days of PO placement.
- 3) BHEL will furnish their approvals / comments within 15 days after submission of drgs/ docs.


TABLE-I

TECHNICAL DATA SHEET OF ELECTRIC ACTUATOR FOR VALVE
(TO BE FILLED IN BLANK SPACES AND FURNISHED BY BIDDER ALONGWITH OFFER)

S.No	PARAMETERS	VENDOR'S RESPONSE
1	Make of actuator/Model No.	As per approved Vendor list
2	Actuator (Motor) rating (kW)	
3	Type of motor (Sq. cage/Induction)	
4	Supply voltage/Frequency	AC 415V +/- 10%; 50Hz +/- 5%
5	Suitable for short time duty	15 min
6	Suitable for minimum no. of starts per hour	150
7	Enclosure protection class for complete actuator unit	Weather Proof to IP 67
8	Motor insulation	Class - F
9	Design ambient Temp.	50 Deg C
10	Minimum starting-voltage	80%
11	Min. Voltage during running for 5 Min.	75%
12	Motor full load current (Rated Torque Current)	
13	Motor starting current (Locked Rotor Current)	

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Attachment: PR DOCS – MAIN – 1900141226-FRAME WORK-CAST IRON BUTTERFLY VALVES.pdf BHARAT HEAVY ELECTRICALS LIMITED PY 52 148	Form No:	 PE&SD	PROJECT ENGINEERING & SYSTEMS DIVISION TECHNICAL SPECIFICATION FOR BUTTERFLY VALVES (WAFER/WAFER LUG) WITH RESILIENT SEAT FOR WATER / AIR SERVICE	Rev. No. 10
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VARIANT TABLE

VAR NO.	MATERIAL DESCRIPTION	DRILLING STD (Refer Cl: 4.3)	OPERN MODE	STARTER TYPE	MATERIAL CODE
01	3" BFLV CI (FG 260) HO PN16 WAFER LUG	CL150 -B16.5	HO		PY9752148018
02	4" BFLV CI (FG 260) HO PN16 WAFER LUG	CL150 -B16.5	HO		PY9752148026
03	6" BFLV CI (FG 260) HO PN16 WAFER LUG	CL150 -B16.5	HO		PY9752148034
04	8" BFLV CI (FG 260) GO PN16 WAFER LUG	CL150 -B16.5	GO		PY9752148042
05	10" BFLV CI (FG 260) GO PN16 WAFER LUG	CL150 -B16.5	GO		PY9752148050
06	12" BFLV CI (FG 260) GO PN16 WAFER LUG	CL150 -B16.5	GO		PY9752148069
07	3" BFLV CS (WCB) HO CL150 WAFER	CL150 -B16.5	HO		PY9752148077
08	8" BFLV CS (WCB) GO CL150 WAFER	CL150 -B16.5	GO		PY9752148085
09	3" BFLV CS (WCB) MO IS CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148093
10	8" BFLV CS (WCB) MO IS CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148107
11	14" BFLV CS(WCB) GO CL150 WAFER	CL150 -B16.5	GO		PY9752148115
12	8" BFLV CI (FG 260) MO PN16 WAFER	CL150 -B16.5	MO	Integral	PY9752148123
13	8" BFLV CI (FG 260) MO PN10 WAFER	CL150 -B16.5	MO	Integral	PY9752148131
14	6" BFLV CS (WCB) HO CL150 WAFER	CL150 -B16.5	HO		PY9752148140
15	2" BFLV CS (WCB) HO CL150 WAFER	CL150 -B16.5	HO		PY9752148158
16	2" BFLV CI HO IS CL150 WAFER	CL150 -B16.5	HO		PY9752148166
17	3" BFLV CI MO IS CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148174
18	1 1/4" BFLV CS (WCB) HO CL150 WAFER	CL150 -B16.5	HO		PY9752148182
19	1 1/2" BFLV CS (WCB) HO CL150 WAFER	CL150 -B16.5	HO		PY9752148190
20	1 1/2" BFLV CS (WCB) MO CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148204
21	2" BFLV CS (WCB) MO CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148212
22	4" BFLV CS (WCB) HO CL150 WAFER	CL150 -B16.5	HO		PY9752148220
23	4" BFLV CS (WCB) MO CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148239
24	6" BFLV CS (WCB) MO CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148247
25	8" BFLV CS (WCB) HO CL150 WAFER	CL150 -B16.5	HO		PY9752148255
26	10" BFLV CS (WCB) GO CL150 WAFER	CL150 -B16.5	GO		PY9752148263
27	10" BFLV CS (WCB) MO CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148271
28	12" BFLV CS (WCB) GO CL150 WAFER	CL150 -B16.5	GO		PY9752148280
29	12" BFLV CS (WCB) MO CL150 WAFER	CL150 -B16.5	MO	Integral	PY9752148298
30	12" BFLV SS (CF8) GO CL150 WAFER	CL150 -B16.5	GO		PY9752148301
31	14" BFLV SS (CF8) GO CL150 WAFER	CL150 -B16.5	GO		PY9752148310
32	16" BFLV CS (WCB) GO CL150 WAFER	CL150 -B16.5	GO		PY9752148328
33	3" BFLV CI HO PN10 WAFER	CL150 -B16.5	HO		PY9752148336
34	4" BFLV CI HO PN10 WAFER	CL150 -B16.5	HO		PY9752148352

BODY MATERIAL


CI - CAST IRON IS 210 GR FG260
 SS- STAINLESS STEEL A 351 CF8M
 WCB- CARBON STEEL A216 Gr.WCB

VALVE OPERATION

HO - HAND OPERATED
 GO - GEAR OPERATED
 MO - MOTOR OPERATED
 PO - PNEUMATICALLY OPERATED
 LS - LIMIT SWITCH


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RECORD OF REVISIONS				
Rev. No.	Date	Revision Details	Revised	Approved
00	14.07.16	FIRST ISSUE	GS	SBR
01	15.10.16	GENERAL REVISION AND NEW VARIANTS ADDED.	GKGC	GS
02	12.08.17	Added point no 42 in actuator datasheet and added variants 11,12,13	GKGC	GS
03	21.10.17	Seat, Seal ring Material updated; Clause 4.7b, 4.7n updated; CI MOC Sln 1 updated; Actuator Data sheet clause 22, 23, 36 updated.	GKGC	GS
04	25.01.18	Integral starter requirement added	GKGC	GS
05	10.02.18	New Variants added 16 to 29	UP	GKGC
06	28.06.18	New Variants added 30 & 31	FRK	SVNR
07	08-07-19	Variant-32 added	SVNR	GS
08	27.02.20	Variant-33 And 34 added	KDK	GS
09	25.04.20	General revision & regarding Page 1: Adding Air service, resilient seat, concentric design, zero leakage, PN10/PN16 drilling std Page 2: removed Body seat ring, disc seal ring & seal retaining ring Page 3: Added concentric, bidirectional and zero leakage requirements and removed O-rings & replacement of shaft seal without shaft removal requirement	GKGC	GS
10	02.11.20	Added Limit switch requirement. Updated Cl 3.0,4.u and 7.1 Updated Cl 2	GKGC	GS

Attachment: PR DOCS – MAIN – 1900141726-FRAME WORK-CAST IRON BUTTERFLY VALVES.pdf	Form No:  PE&SD	PROJECT ENGINEERING & SYSTEMS DIVISION PURCHASE SPECIFICATION SPARE FOR BUTTERFLY VALVES	PY 52156 Rev. No. 00 Page 1 of 3
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SPARES FOR BUTTERFLY VALVES**1.0 SCOPE OF SUPPLY**

The spares for Butterfly Valves have to be offered as a loose supply. The construction, dimension, material of these items shall be exactly same as supplied for the main valve & shall be suitable for direct replacement without any modification/ alterations in the main valve.

1.1 DESIGNATION: As indicated in the variant table.

2.0 DISPATCH & PACKING




The full responsibility of dispatch & packing of the items / equipment rests on the vendor to determine that the packing is adequate to assure that all the items / equipment shall arrive at the destination in an undamaged condition. The vendor shall ensure that the items / equipment packed are adequately protected against shock during shipment / handling. There shall not be any damage during storing at site & also it shall be ready for intended use.


All the items shall be dry, clean and free from moisture, dirt and loose foreign materials of any kind. All the items shall be protected from rust, corrosion and any mechanical damage during transportation, shipment and storage.

The open ends of all the equipment shall suitably be protected and the protectors shall be securely and tightly attached. Dummy plastic sheets of minimum 1 mm thickness shall be used for this purpose.

3.0 DOCUMENTATION

Vendor shall make the offer in detail, with respect to every item of the Purchaser's specifications. Vendor's offer shall include engineering documents along with relevant drawings.

Refer Doc	LAYOUTS & PIPING ENGINEERING	PREPARED	CHECKED	APPROVED	DATE
		 CHM	 CHM	 GSRIKANTH	12.01.16

Attachment: PR	Form No:	 PE&SD	DOCS – MAIN – 1900141726-FRAME WORK-CAST IRON BUTTERFLY VALVES.pdf
			BHARAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING & SYSTEMS DIVISION
			PY 52156 Rev. No. 00
PURCHASE SPECIFICATION SPARES FOR BUTTERFLY VALVES			Page 3 of 3

RECORD OF REVISIONS:

Rev No	Date	Revision Detail	Revised by	Approved by
00	12.01.16	FIRST ISSUE	CHM	GS

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