

NORTH -EAST GAS GRID PIPELINE PROJECT

BID DOCUMENT FOR

PROCUREMENT OF BALL VALVES & PLUG VALVES FOR FEEDER LINES

OPEN DOMESTIC COMPETITIVE BIDDING

Tender Ref. No.: 05/51/23VC/IGGL/002B

VOLUME – II OF II



PREPARED AND ISSUED BY

MECON LIMITED (A Govt. of India Undertaking) Delhi, India

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1.0 SCOPE OF SUPPLY

The scope of supply includes Ball & Plug valves conforming to design standard as specified in Table - 1 and meeting other technical requirements as specified in bid document (i.e. as per MR, Data Sheets & Technical Specifications), getting approvals from Purchaser/ Consultant, procurement of raw material, manufacturing, testing & inspection, packing & forwarding & transportation, unloading to north eastern states as per tender terms & conditions. The details of valves to be supplied are in Table 1 below:

Group-A	Group-A: BALL VALVES as per Design Standard API 6D, MECON's specification no. MEC/TS/05/21/002, Rev-1,									
MR Item No	MR Item NoSizeBodyBoreEndsClassDatasheet No.Stem ExtensionQtyValve operatorRe									Remarks
1.	600 (24")	Fully Welded Body	FB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/01	Yes	01	AV	REMOTE OPERATED
2.	300 (12")	Fully Welded Body	FB	BW	600 #	MEC/23UU/05/28/ M/001/DS/BV/02	No	11	Manual	
3.	300 (12")	Fully Welded Body	RB	BW	600 #	MEC/23UU/05/28/ M/001/DS/BV/03	No	5	Manual	
4.	300 (12")	Fully Welded Body	RB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/04	No	12	AV	3 no. valve with Auto closure facility
5.	200 (8")	Fully Welded Body	RB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/04	No	12	AV	
6.	200 (8")	Fully Welded Body	RB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/05	Yes	02	Manual	
7.	200 (8")	Fully Welded Body	RB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/03	No	25	Manual	
8.	100 (4")	Fully Welded Body	RB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/03	No	36	Manual	
9.	100 (4")	Either Welded Body or 2/3 Piece Bolted	RB	FE	600#	MEC/23UU/05/28/ M/001/DS/BV/06	No	10	Manual	

Table – 1

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10.	50 (2")	Fully Welded Body	FB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/02	No	124	Manual	
11.	50 (2")	Fully Welded Body	FB	BW	600#	MEC/23UU/05/28/ M/001/DS/BV/07	No	10	Manual	LTCS
12.	20 (3/4")	Fully Welded Body	FB	SW	800#	MEC/23UU/05/28/ M/001/DS/BV/08	No	126	Manual	
13.	20 (3/4")	Fully Welded Body	FB	SW	800#	MEC/23UU/05/28/ M/001/DS/BV/09	No	20	Manual	LTCS

Group-B	Group-B: PLUG VALVES as per Design Standard API 6D, MECON's specification no. MEC/TS/05/62/003, Rev-1 and data sheet nos. given below:									
MR Item No	Size	Pattern	End s	Class	Datasheet No.	Stem Extension	Qty	Valve operator	Remarks	
14.	200 (8")	REGULAR	BW	600#	MEC/23VC/05/28 /M/001/DS/PV/01	No	01	Manual	LTCS	
15.	100 (4")	REGULAR	RF	600#	MEC/23VC/05/28 /M/001/DS/PV/02	No	06	Manual	LTCS	
16.	50 (2")	REGULAR	BW	600#	MEC/23VC/05/28 /M/001/DS/PV/03	No	28	Manual		
17.	50 (2")	REGULAR	BW	600#	MEC/23VC/05/28 /M/001/DS/PV/01	No	10	Manual	LTCS	

NOTE: Bidder to fill records of their purchase orders and IRN / Dispatch clearance in the attached format

LEGEND

- **FB** = Full Bore
- **RB** = Reduced Bore
- **BW** = Butt Welded
- **FE** = Raised Face (Flanged)
- **LTCS** = Low Temperature Service Valves
- Ext. Stem = Extended stem
- **AV** = Remote Operated Gas-Powered Actuated Valve

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2.0 DOCUMENTS & DATA REQUIREMENTS

- 2.1 The table here under specifies the quantities and the nature of the documents to be submitted by the Package Contractor to Purchaser.
- 2.1.1 The documents required at the inquiry stage and to be included in the bid are listed under column A of clause 2.6 below.
- 2.1.2 The documents required after award of the Contract and subject to the written approval of the Purchaser are listed under column B of clause 2.6 below.
- 2.1.3 The final and certified documents are listed under column C of clause 2.6 below.
- 2.2 Any document, even when preliminary, shall be binding and therefore duly identified and signed by the Vendor. It shall bear the Purchaser's Project reference, the Material Requisition number and the identification number.
- 2.3 The drawings/documents shall be reviewed, checked, approved and duly signed/stamped by successful Bidder/supplier before submission. Revision number shall be changed during submission of the revised successful Bidder/supplier documents and all revisions shall be highlighted by clouds. Whenever the successful Bidder/supplier require any sub-supplier drawings to be reviewed by MECON, the same shall be submitted by the supplier after duly reviewed, approved and stamped by the successful Bidder/supplier. Direct submission of the sub-supplier's drawings without contractor's approval shall not be entertained.
- 2.4 Review/Approval of the successful Bidder/supplier drawings by MECON would be only to review the compatibility with basic designs and concepts and in no way absolve the successful Bidder/supplier of his responsibility/contractual obligation to comply with tender requirements, applicable codes, specifications and statutory rules/regulations. Any error/deficiency noticed during any stage of manufacturing/execution/installation shall be promptly corrected by the successful Bidder/supplier without any extra cost or time, whether or not comments on the same were received from MECON during the drawing review stage.
- 2.5 The successful Bidder/ Supplier shall submit a prerecorded Training pen drive and it shall comprise the basic theories and fundamentals, related standards, design parameters, scanned copies of approved drgs./docs., manufacturing & inspection methods, operating & maintenance instructions and other relevant details. The pen drive shall have to be self-contained, user-friendly using animation/videos and other multimedia techniques.
- 2.6 THE DOCUMENTS ARE FULLY PART OF THE SUPPLY WHICH SHALL BE COMPLETE ONLY IF AND WHEN THE DOCUMENTS COMPLYING FULLY WITH THE TENDER REQUIREMENTS ARE RECEIVED BY THE PURCHASER.

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		Α		В		С
ltem	Documents & Data	No. of Copies	No. of Copies	Required Date (from FOI)	No. of Copies	Required Date (before Dispatch)
1.	Completed Data Sheets	3	3	2 Weeks	3	2 Weeks (With final technical file)
2.	Drawing / Data Submittal list / schedule	-	3	2 Weeks + monthly	3	2 Weeks
3.	Fabrication, test and delivery schedule (per item)	3	3	2 Weeks + monthly	3	2 Weeks
4.	Fire Safe certificate as per API 6FA & API 607	3	-	-	-	-
5.	Progress Report	-	3	2 Weeks + monthly	3	2 Weeks
6.	Catalogues / References	3	-	-	3	With final technical file
7.	GA drawings + Sectional drawings + Material specification + Unit weight. + Unit volume + Package dimensions per unit (All above per valve and actuator)	3	3	2 Weeks	3	With final technical file
8.	"Way of Shipping" as per Notes to Material Requisition	-	3	7 days	-	-
9.	Packing / shipping list with weights and dimensions	-	3	2 Weeks before shipping	3	2 Weeks (With final technical file)
10.	Design calculations for pressure containing parts	-	3	2 Weeks	3	2 Weeks (With final technical file)
11.	Welding details for the pups	-	3	2 Weeks	3	2 Weeks (With final technical file)
12.	Torque curves + Torque calculations	3	3	2 Weeks	3	2 Weeks (With final technical file)
13.	Bill of materials (on drawings)	-	3	2 Weeks	3	2 Weeks (With final technical file)
14.	Recommended spare parts list (for erection and commissioning)	3	-	-	3	2 Weeks (With final technical file)
15.	Recommended spares parts list (for 2 years operation)	3	-	-	3	2 Weeks (With final

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16.	Welding procedure specification and records WPS / PQR	-	3	2 Weeks	3	2 Weeks (With final technical file)
17.	QA / QC program	3	3	2 Weeks	3	2 Weeks (With final technical file)
18.	Inspection and Test Procedures along with Quality Assurance Plan	3	3	2 Weeks	3	2 Weeks (With final technical file)
19.	Test Reports	-	-	-	3	2 Weeks (With final technical file)
20.	NDE / NDT Reports	-	-	-	3	2 Weeks (With final technical file)
21.	Heat Treatment Reports	-	-	-	3	2 Weeks (With final technical file)
22.	Hydrotest and air test report	-	-	-	3	2 Weeks (With final technical file)
23.	Maintenance and operating manuals	-	-	-	3	2 Weeks (With final technical file)
24.	Installation instructions & Site inspection procedure	-	-	-	3	2 Weeks (With final technical file)
25.	Material certificate as per EN 10204 - 3.2	-	-	-	3	2 Weeks (With final technical file)
26.	Painting system description & procedure	3	3	2 weeks	3	2 Weeks (With final technical file)
27.	List of sub-vendors with their scope	3	3	2 weeks		
28.	Training pen drive covering design, operation & maintenance	-	-	-	3	2 Weeks (With final technical file)
29.	Final technical file, preliminary copy for approval (in soft & hardcopy)	-	3	2 weeks before dispatch/ shipping	-	-
30.	Final technical file (hardcopy)	-	-	-	3	Before shipping
31.	Final technical file (softcopy – .pdf - Acrobat files in pen drive)	-	-	-	6	

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<u>NOTES</u>

- 1) In case of e-bids, only single copy of documents / drawings / data under column A need be uploaded.
- 2) Durations in column B (required date) are weeks after FOI or as indicated in Table.
- 3) Durations in column C (required date) are weeks after document approval or as indicated in Table. Due date of each document may be proposed.
- 4) The above documents & data requirements shall also be supplemented by all requirements of clause 10.0 of MECON's T.S. No. MEC/TS/05/28/002.
- 5) For documents & data requirements of gas-powered valve actuators refer clause no. 9.0 of specification no. MEC/TS/05/E5/002A (Technical specification for gas powered valve actuators).

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Summary of PTR Documents

1.	2.	3.	4.
MR SI.	Purchase Order no. & dtd.	Corresponding IRN / Completion letter	Maximum Size along
No.	supplied in past 7 years from Bid Due	/Dispatch Clearance / Proof of supply with	with corresponding
	Date	document no. & dtd.	highest Rating Supplied
	(Enclose copy of the same)	(Enclose copy of the same)	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

NOTES TO MR

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1.0 Introduction

INDRADHANUSH GAS GRID LIMITED intends to procure ball and plug valve for feeder line for NORTH EAST GAS GRID PIPELINE PROJECT as listed in the MR.

- 2.0 <u>Price Evaluation Basis:</u> As per Bidder's Eligibility Criteria (BEC)
- **3.0** <u>Compliance with Specification:</u> The Vendor shall be completely responsible for the design, materials, manufacture & fabrication, testing, inspection, preparation for shipment and transport of the above equipment strictly in accordance with the MR and all attachments thereto. Minimum all pressure containing and pressure controlling parts of Valves and Actuators shall be provided with EN 10204-3.2 certificates.
- **4.0** <u>Vendor's Scope:</u> Vendor scope of work includes the equipment with all internals and accessories shown on the datasheets, specifications and all unmentioned parts necessary for a satisfactory operation and testing, except those which are indicated to be out of the vendor's supply.

5.0 Inspection:

Inspection shall be in accordance with EN 10204 3.2 certification shall be issued for each dispatched valve. Vendor shall appoint anyone of the TPIA for inspection purpose. Vendor has to intimate the TPIA name from below listed agencies to IGGL / MECON prior to perform any inspection activity.

- i. Det Norske Veritas (DNV)
- ii. Germanischer Lloyd
- iii. Bureau Veritas
- iv. Moody International
- v. SGS
- vi. Certification Engineer International Ltd (CEIL)
- vii. Technische Ulierwachungs Verein (TUV)
- viii. Velosi
- ix. American Bureau Services (ABS)
- x. AB-Vincotte
- xi. Lloyd Register of Industrial Services
- xii. VCS Quality Services Private Limited
- xiii. Meenar Global

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- **6.0** For all values to be used in Gaseous Hydrocarbons service, impact & hardness tests / values as per clause 3.4, 3.5 & 3.6 of specification no. MEC/TS/05/21/002 shall be applicable.
- **7.0** Vendor shall quote separately spares for two years normal operation for valves & actuators as per price schedule Performa. List of spares quoted shall be furnished as per attached Format.
- **8.0** Vendor to include the start up and commissioning spares for valves & actuators (if applicable) in the quoted price for the valves. However, list of spares (start up and commissioning) to be made available without prices as per attached Format.
- **9.0** Vendor to indicate in his offer the gross weight (in kg or Metric Tonne) per unit, volume (in m3) per unit and dimensions (L x B x H) of package (wooden box, etc.) to accommodate unit quantity or number of quantities (as applicable).
- **10.0** Vendor must submit duly filled up & signed data sheets, check list and forms along with his offer.
- **11.0** Vendor shall establish the equivalence/superiority of any material proposed (With justification of material properties and availability) other than that specified in Datasheet. Vendor shall also indicate the ASTM equivalent of his proposed material as well as of all the AISI designated materials specified in datasheets.
- **12.0** Vendors to note that for minimum inspection and testing requirement of the valves shall be governed by attached QAP with this MR. However, vendor shall submit their QAP for approval covering the requirement specified in attached QAP.
- **13.0** Bidders to note that all the documents/drawings submitted by them as a part of bid shall be considered only to assess Bidder's technical capability and shall in no way absolve them from complying with all the requirements of the Tender. All items to be supplied by the Bidder shall be strictly in accordance with tender requirements.
- **14.0** In the event of Conflict/inconsistency among the documents attached/ referred, the following order of precedence generally shall govern in interpretation of various requirements / data.
 - Material / Purchase Requisition & Notes to MR
 - Datasheets
 - Technical Specification
 - Codes and Standards
 - Vendor's Standards

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However, Owner/Consultant reserves the right to consider most stringent requirement among the document attached / referred.

- **15.0** Bidder/supplier shall submit hard copies of all documents/ drawings to MECON, as listed in columns B & C of table for document and data requirement under Clause 2.0 of MR and also in all technical specifications. The date of receipt of these documents/ drawings at MECON shall be deemed as the date of submission. If any documents/ drawings require re-submission due to any error/ deficiency noticed during review/ approval stage, in that event the additional time required by the bidder/supplier to get the revised document/ drawing reviewed/approved by MECON shall be solely to bidder's/supplier's account and in no case the bidder/ supplier shall be entitled for any time or cost benefit.
- 16.0 Bidders to note that the valves supplied by them shall be capable to withstand the field hydro test pressure (i.e. 1.5 times of design pressure) for 6 to 24 hours test holding duration under field / site conditions. The valve's ball / plug (BALL VALVES / PLUG VALVES) shall be kept in either partial or full open condition for entire test duration and test medium will be non-corrosive water. The vendor shall be liable for repair/ replacement of valve if found faulty during site hydro test at his risk & cost. All cost for associated activities like packaging, transportation etc. in connection to repair / replacement of valve shall be borne by the bidder. No claim shall be entertained by the Owner / Purchaser in this regard.
- **17.0** Vendors to note that packing & transportation of the valves shall be done strictly as per attached technical specification for handling and transportation.
- 18.0 Vendors to note that the entire ordered quantity shall be offered for MECON inspection as per following table. In case no. of visits of MECON engineer become more than as specified in table below for complete order quantity, vendor shall bear the touring expenditure of MECON/IGGL engineers as per company rules. IGGL/MECON reserves the right to waive off this requirement in case of project exigencies.

S.No.	Size	Minimum Quantity for one lot
1	30" and higher	Upto 5 valves
2	16" to 28"	Upto 8 valves
3	8" to 14"	Upto 20 valves
4	³ ⁄ ₄ " to 6"	Upto 200 valves

In case of any multiple of the ordered quantity the no. of valves shall be divided by quantity specified for one lot in above mentioned table to arrive at the no. of lots. No. of lots shall be determined by rounding off to next integer.

19.0 Vendors to note that TPI inspection is either to be conducted before MECON inspection or in parallel. In no case TPI inspection shall be permitted after MECON inspection. For the valves where MECON inspection extent is 100% witness, TPI inspection maybe allowed in parallel with MECON. However, for valves requiring 10% MECON witness

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inspection, vendor has to finish TPI inspection before raising call and upload TPI inspection report in Inspection Management System of MECON.

20.0 Extent of MECON witness during final inspection shall be as follows:

SI. No.	Size range	Class	Mecon Inspection extent
1.	2" to 8"	150	10% random witness and document review for 100% valves.
2.	10" and more	150	100% witness.
3.	2" to 6"	300 and higher	10% random witness and document review for 100% valves.
4.	8" and more	300 and higher	100% witness.
5.	Below 2"	All classes	10% random witness and document review for 100% valves.

- **21.0** Strip Test: Vendor need to demonstrate strip test of bolted body valves. For this test one valve of each ordered size and rating shall be selected at random after successful hydro and pneumatic tests by TPI & MECON inspector. The valve shall be dismantled completely. Alloy steel parts shall be checked for compliance to relevant material code using Positive material identification technique. Selected valve(s) shall then be reassembled after replacing sacrificial parts like gasket & O-rings and complete final inspection as per approved QAP shall be carried out once again to ensure the repeatability of body seals and seats.
- **22.0** For Trunnion Mounted Ball Valves, where ever, DIB-1 seats are specified in datasheets, Self relieving seats are not applicable as per cl. 4.8 of TS no. MEC/TS/05/21/002.

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TITLE		BALL VALVE	MEC/TS/05/21/002	REVISION : 1		
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AMENDMENT STATUS

SI.	Clause / Paragraph /	Page	Rov	Date	Ву		Verifie	d
No.	Drawing Amended	No.	Nev.	Date	Name	Sig.	Name	Sig.
1.	Cl. No. 4.6	4	1	April 09	Gurdeep Singh		K.K. De	
2.	Overall Revision	All	1	July 20	K.P. Singh		A.K. Tyagi	

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			EDITION : 1

Abbreviations :

ASME	:	American Society of Mechanical Engineers
ASTM	:	American Society for Testing and Materials
API	:	American Petroleum Institute
BHN	:	Brinell hardness number
DN	:	Nominal Size
HAZ	:	Heat Affected Zone
LC	:	Lock Close (valve locked in full close position)
LO	:	Lock Open (valve locked in full open position)
MSS-SP	:	Manufacturers Standardization Society – Standard Practice
NDT	:	Non Destructive Testing
NPS	:	Nominal Pipe Size
RTJ	:	Ring Type Joint
SSPC	:	Steel Structures Painting Council

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SI.No.	Description					
1.0	SCOPE					
2.0	REFERENCE DOCUMENTS					
3.0	MATERIALS					
4.0	DESIGN AND CONSTRUCTION					
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6.0	EXTENT OF INSPECTION & TES	TING				
7.0	TEST CERTIFICATES					
8.0	PAINTING, MARKING AND SHIPMENT					
9.0	SPARES AND ACCESSORIES					
10.0	DOCUMENTATION					
11.0	GUARANTEE					
FIGURE-1	VENT, DRAIN & SEALANT INJECTION DETAILS					

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1.0 <u>SCOPE</u>

This specification covers the minimum requirements for design, manufacture, testing and supply of carbon steel ball valves of size DN 50 mm (2") and above and ANSI pressure rating class 150 to 900 to be used in on-shore pipeline systems handling non-sour hydrocarbons in liquid or gaseous phase, including Liquefied Petroleum Gas (LPG).

This specification does not cover ball valves for sour hydrocarbon (liquid / gas) service as defined in NACE standard MR-01-75.

2.0 **REFERENCE DOCUMENTS**

- 2.1 All valves shall be manufactured and supplied in accordance with the latest edition of American Petroleum Institute (API) Specification 6D / ISO 14313, with additions and modifications as indicated in the following sections of this specification.
- 2.2 Reference has also been made in this specification to the latest edition of the following Codes, Standards and Specifications:

ASME B 16.5	:	Pipe flanges and flanged fittings
ASMEB 16.10	:	Face-to-face and end-to-end dimensions of valves
ASME B 16.25	:	Butt welding ends
ASME B 16.34	:	Valves – flanged, threaded and welding ends
ASME B16.47	:	Large diameter steel flanges
ASME B 31.3	:	Process piping
ASME B 31.4	:	Pipeline transportation systems for liquid hydrocarbons and other liquids
ASME B 31.8	:	Gas transmission and distribution piping systems
ASME Sec VIII	:	Boiler and pressure vessel code - Rules for construction of pressure vessels
ASME Sec IX	:	Boiler and pressure vessel code - Welding and brazing qualifications
ASTM A 370	:	Standard test methods and definitions for mechanical testing of steel products
ASTM B 733	:	Autocatalytic nickel phosphorous coating on metals
API 6FA	:	Fire test for valves
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	API 607 :	Fire	test for soft-seated quarte	er-turn valves
	API 1104 :	Wel	ding of pipelines and relat	ed facilities
	BS EN ISO 10497 :	Test	ing of valves – Fire type-t	esting requirements
	MSS-SP-6 :	Star conr	dard finishes for contact necting-end flanges of val	faces of pipe flanges and ves and fittings
	MSS-SP-44 :	Stee	l pipeline flanges	
	SSPC-VIS-1 :	Stee	l structures painting coun	cil-visual standard
2.3	In case of conflict betw Codes, Standards and S of this specification shall	veen the Specificati govern.	requirements of this spec ons referred in clause 2.2 Order of precedence shal	cification, API 6D and the 2 above, the requirements I be as follows :
	 Valve Data Sheet Material Requisiti This Specification API 6D Specificat Other Referred C Manufacturer's Signal 	ts on tion odes & S tandard	tandards	
3.0	MATERIALS			
3.1	Material for major comp Sheet. Other componer service conditions indica Purchaser. In addition, hereinafter.	oonents c nts shall t ated in E the mat	of the valves shall be as be as per Manufacturer's Data Sheet) and shall be erial shall also meet the	indicated in Valve Data standard (suitable for the subject to approval by e requirements specified
3.2	Carbon steel used for the	e manufa	cture of valves shall be fu	lly killed.
3.3	The Carbon Equivalent field welding by Purchas formula) on check analys	(CE) of v ser, shall sis for eac	ralve end connections wh not exceed 0.43% (as c h heat of steel used:	iich are subject to further alculated by the following
	%Mn	%Cr +	%Mo + %V %Ni + 9	%Cu
	CE = %C + + 6		5	
3.4	For Valves specified to b on each heat of base ma pressure containing part bolting material for press notch test shall be condu The average absorbed e	e used fo aterial sh s such a ure conta ucted at (nergy val	or Gas service or LPG ser all be conducted as per / s body, end flanges and ining parts. Unless stated 0 °C. Test procedure shal ue of three full sized spec	vice, Charpy V-notch test, API 6D Clause 8.5, for al welding ends as well as I otherwise, the Charpy V- I conform to ASTM A370, cimens shall be 27 J. The

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	minimum impact energy value analysed as above, shall not be les	for any one specimen ss than 22 J.	of the three specimens		
	When Low Temperature Carbon Steel (LTCS) materials are specified in Valve Data Sheet or offered by Manufacturer, the Charpy V-notch test requirements of applicable material standard shall be complied with.				
3.5	For all such valves where carbon steel is used as ball material, the ball shall have 75 micrometer (0.003 inch) thick Electroless Nickel Plating (ENP) as per ASTM B733 with following classification : SC2, Type II, Class 2. The hardness of plating shall be minimum 50 RC.				
3.6	For valves specified to be used for Gas service or LPG service, hardness test shall be carried out as per ASTM A370 for each method of manufacture and each heat of steel used in the manufacture of valves. A full thickness cross-section shall be taken for this purpose and the maximum hardness of the materials of valve components shall not exceed 248 HV_{10} .				
3.7	All process-wetted parts, metallic and non-metallic, shall be suitable for the fluids and service specified by the Purchaser. The service gas composition shall be as given elsewhere in the Material Requisition. In addition, Manufacturer shall confirm that all wetted parts are suitable for treated water / seawater environment, which may be used during field testing.				
3.8	Non-metallic parts of the valves (including O-rings, soft seal etc.) intended for hydrocarbon gas service at pressures of PN 100 (600 #) and above shall be resistant to explosive decompression.				
4.0	DESIGN AND CONSTRUCTION				
4.1	Valve design shall meet the requirements of API 6D and other referred codes and shall be suitable for the service conditions indicated in Valve Data Sheet. The ASME Boiler & Pressure Vessel Code, Section VIII, Division 1, may be used to design the valve body. Allowable stress requirements shall comply with the provisions of ASME B31.3. In addition, corrosion allowance indicated in Valve Data Sheet shall be considered in valve design. However, the minimum wall thickness shall not be less than the minimum requirement of ASME B16.34. The Manufacturer shall have a valid license to use API 6D monogram for manufacture of ball valves.				
4.2	For above ground valves, valve body design shall be either fully welded or bolted type, as indicated in Valve Data Sheet. Valve body joints with threads are not permitted.				
	For buried valves, valve body design shall be fully welded type only. Valve body joints with bolts or threads are not permitted.				

4.3 Ball shall be of single piece, solid type construction.

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4.4 Valves shall be Full Opening (FO) or Reduced Opening (RO) as indicated in Valve Data Sheet. FO valves shall be suitable for the passage of all types of pipeline scraper and inspection pigs on regular basis without causing damage to either the valve component or the pig. The FO valve shall provide an unobstructed profile for pigging operations in either direction. FO valves shall be designed to minimize accumulation of debris in the seat ring region to ensure that valve movement is not impeded.

The opening size of RO valves shall be corresponding to that of a FO valve of smaller nominal diameter as indicated in table below. For sizes of a particular rating not covered in API 6D, the opening sizes of the RO valve shall be as per Manufacturer's standard.

Nominal Valve Size	Nominal Valve Size for Reduced Opening	Nominal Valve Size	Nominal Valve Size for Reduced Opening
DN _{mm} (NPS _{inches})	DN _{mm} (NPS _{inches})	DN _{mm} (NPS _{inches})	DN _{mm} (NPS _{inches})
50 (2)	50 (2)	600 (24)	500 (20)
80 (3)	50 (2)	650 (26)	550 (22)
100 (4)	80 (3)	700 (28)	600 (24)
150 (6)	100 (4)	750 (30)	600 (24)
200 (8)	150 (6)	800 (32)	650 (26)
250 (10)	200 (8)	850 (34)	700 (28)
300 (12)	250 (10)	900 (36)	750 (30)
350 (14)	250 (10)	950 (38)	800 (32)
400 (16)	300 (12)	1000 (40)	850 (34)
450 (18)	350 (14)	1050 (42)	900 (36)
500 (20)	400 (16)	1200 (48)	1050 (42)
550 (22)	450 (18)		

4.5

Ball mounting shall be trunnion / pivot type or as indicated in Valve Data Sheet. Ball mounting, either trunnion or floating, unless otherwise specified, shall be as follows.

SI.	ANSI Pressure Rating	Nominal Valve Size (NPS inches)		
No.		Floating Ball	Trunnion Mounted	
1.	150#	<u><</u> 8"	> 8"	
2.	300#	<u><</u> 4"	> 4"	
3.	600#	Nil	<u>></u> 2"	

Valve design shall minimize the possibility of debris ingress into the trunnion as far as practicable.

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4.6	Valve seats shall have metal to m tight sealing, shall be encased in be removed from seat ring and operation of valve at maximum rating. The seat rings shall be so high differential pressures.	Valve seats shall have metal to metal contact. O-rings or other seals, if used for drip tight sealing, shall be encased in a suitable groove in such a manner that it can not be removed from seat ring and there is no extrusion during opening or closing operation of valve at maximum differential pressure corresponding to valve class rating. The seat rings shall be so designed as to ensure sealing at low as well as high differential pressures.			
4.7	Valves shall have double block an draining and venting of the valve b	d bleed feature to facilitate body cavity.	e complete flushing,		
4.8	For valves to be used in liquid prevented by self relieving seat ri is not permitted. Self relieving se pressure not exceeding 50% of the	For valves to be used in liquid service, the body cavity over-pressure shall be prevented by self relieving seat rings / assemblies. A pressure relief hole in the ball is not permitted. Self relieving seat rings shall relieve at a body cavity differential pressure not exceeding 50% of the valve class rating pressure.			
4.9	Valves shall be designed to withst milli-bar in both open and closed p	Valves shall be designed to withstand a sustained internal vacuum of at least 1 (one) milli-bar in both open and closed positions.			
4.10	FO valves of nominal size DN 200 DN 250 mm (10") & above shall h full line pressure for seat and ste provided with a needle valve, a shall have a provision to replace Location and arrangement of seal	0 mm (8") & above and R ave provision for seconda m seals. All sealant injec grease fitting and non-re the sealant injection fitting ant points shall be as per	O valves of nominal size ry sealant injection under tion connections shall be turn valve. Valve design under full line pressure. Figure-1.		
4.11	Valves shall be provided with vent of vents and drains shall be as po with valves (ball or plug type). Nur	t and drain connections. L er Figure-1. Body vent an nber and size shall be as	ocation and arrangement d drain shall be provided per Figure-1.		
4.12	Valve design shall ensure repair o	f stem seals / packing und	ler full line pressure.		
4.13 a)	Valve ends shall be either flanged or butt welded or one end flanged and one end butt welded as indicated in Valve Data Sheet. Flanges of the flanged end cast/ forged body valves shall be integrally cast / forged with the body of valve. Face-to- face/ end-to-end dimensions shall conform to API 6D. Face-to-face and end-to-end dimensions for valve sizes not specified in API 6D shall be in accordance with ASME B 16.10. Face-to-face and end-to-end dimensions not shown in API 6D or in ASME B 16.10 shall be as per Manufacturer Standard and shall be subject to approval by Purchaser.				
b)	Flanged ends shall have flanges mm (24 inches) excluding DN 550 16.47 series A for valve sizes DN and above. Flange face shall b indicated in Valve Data Sheet. F indicated in Valve Data Sheet. S microinches AARH. In case of RT 140 BHN.	as per ASME B16.5 for v mm (22 inches) and as p 550 mm (22 inches) & for e either raised face or flange face finish shall be smooth finish when speci TJ flanges, the groove ha	valve sizes up to DN 600 ber MSS-SP-44 / ASME B r DN 650 mm (26 inches) ring joint type (RTJ) as e serrated or smooth as fied shall be 125 to 200 rdness shall be minimum		

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c)	Butt weld end preparation shall to which the valve has to be Valves shall be without transiti sheet. In case significant diffe valve and connecting pipe, the v per ASME B31.4 or ASME B31.8	be as per ASME B16.25. welded shall be as indicat on pups, unless otherwise rence exists between thick velding ends of valve shall h 3, as applicable.	The thickness of the pipe ed in Valve Data Sheet specified in Valve Data ness of welding ends o nave bevel preparation as	
4.14	Design of weld end valves shall seals or plastic components of damaged. The Manufacturer sh post-weld test procedure to der field welding operations.	be such that during field we f the valve (where ever us nall furnish necessary field nonstrate integrity and leak	elding operations, the sof sed) are not liable to be welding instructions and t-tightness of valves afte	
4.15	Valves shall be provided with ba at the fully open and fully closed	Valves shall be provided with ball position indicator and stops of rugged construction at the fully open and fully closed positions.		
4.16	FO values of nominal size \ge DN 200 mm (8") and RO values of nominal size \ge DN 250 mm (10") shall be equipped with support foot and lifting lugs. Tapped holes and eye bolts shall not be used for lifting lugs. Height of support foot shall be kept a minimum. The location and size of support foot / lifting lugs shall ensure unrestrictive operation of vent / drain values.			
4.17	Valve design shall be such as to avoid bimetallic corrosion between carbon steel and high alloy steel components. Suitable insulation shall be provided as required.			
4.18	Valves shall be of fire resistant design as per API 607/BS EN ISO 10497/API 6FA, as indicated in Valve Data Sheet.			
4.19	Valves shall be provided with anti-static devices to ensure electrical continuity between stem / ball and valve body.			
4.20	Valves shall be suitable for either buried or above ground installation as indicated in Valve Data Sheet.			
4.21	When stem extension requirements have the following provisions :	When stem extension requirement is indicated in Valve Data Sheet, the valves shall have the following provisions :		
	a) Valves provided with st Length of stem extension length indicated correspon opening and the top of operator / power actuator	em extension shall have v on shall be as indicated in onds to the distance betwee mounting flange for valve as applicable).	vater proof outer casing Valve Data Sheet. The en centerline of the valve e operating device (gea	
	 b) Vent and drain connect adjacent to the valve op valve body. Pipe used s 80. Fittings shall be AS ANSI class 6000. 	ions and sealant injection erator by means of suitabl hall be API 5L Gr. B / AST TM A 105 / ASTM 234 G	lines shall be terminated e piping anchored to the M A 106 Gr. B, with Sch r. WPB, Socket Welded	

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- c) Stem extension and stem housing design shall be such that the complete assembly will form a rigid unit giving a positive drive under all conditions with no possibility of free movement between valve body, stem extension or its operator.
- d) Outer casing of stem extension shall have 3/8" or ½" NPT plugs at the top and bottom, for draining and filling with oil to prevent internal corrosion.

4.22 **Operating Devices**

- a) Valves shall have a power actuator or manual operator as indicated in Valve Data Sheet. In case of manual operator, valve sizes ≤ DN 100 mm (4 inches) shall be wrench operated and valve sizes ≥ DN 150 mm (6 inches) shall be gear operated. Each wrench – operated valve shall be supplied with wrench. Valve design shall be such that damage due to malfunctioning of the operator or its controls will only occur in the operator gear train or power cylinder and that damaged parts can be replaced without the valve cover being removed.
- b) The power actuator shall be in accordance with the Purchaser specification issued for the purpose and as indicated in Valve and Actuator Data Sheet. Operating time shall be as indicated in Valve Data Sheet. Valve operating time shall correspond to full close to full open/full open to full close under maximum differential pressure corresponding to the valve rating. For actuated valves, the actuator torque output shall be 1.25 times the break torque required to operate the ball valve under the maximum differential pressure corresponding to the valve class rating.
- c) For manual operator of all valves, the diameter of the hand wheel or the length of operating wrench shall conform to API 6D requirements and be such that under maximum differential pressure, the total force required to operate the valve does not exceed 350 N. Manufacturer shall also indicate the number of turns of hand wheel (in case of gear operators) required for operating the valve from full open to full close position.
- d) Direction of operation of hand wheel or wrench shall be in clock-wise direction while closing the valve. Hand wheels shall not have protruding spokes.
- e) Gear operators, when provided, shall have a self locking provision and shall be fully encased, in water proof/ splash proof/ dust proof/ weather proof enclosure and shall be filled with suitable grease.
- f) Operating devices shall be designed for easy operation of the valve under maximum differential pressure corresponding to the valve rating.
- 4.23 All welds shall be made by welders and welding procedures qualified in accordance with the provisions of ASME Section IX. The procedure qualification shall include impact test and hardness test and shall meet the requirements of clauses 3.4 and 3.6 of this specification, respectively.
- 4.24 All welds shall be stress relieved in accordance with ASME Section VIII.

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4.25	Repair by welding is not permitter repair by welding as per ASME repairs shall be carried out at cast before any heat treatment of cast shall also include impact test and clauses 3.4 & 3.6 of this specificat	d for fabricated and forge B16.34 is permitted for ting supplier's care only. F ing is done. Repair weldir hardness test and shall r tion, respectively.	ed body valves. Howev cast body valves. Su Repair shall be carried o ng procedure qualification meet the requirements
4.26	The tolerance on internal diamete valves shall be as per applicable Data Sheet.	r and out of roundness at connected pipe specificat	the ends for welded e tion as indicated in Va
4.27	When indicated in Material Requivalve either in full open (LO) or permanently attached to the valve the valve.	sition, valves shall have l full close (LC) positions. e operator and shall not i	ocking device to lock Locking devices shall nterfere with operation
4.28	Valve stem shall be capable of wi to operate the valve against the applicable class rating. The co allowable stresses specified in A actuated valves, the valve stem si selected power actuator (including	thstanding the maximum of maximum differential prombined stress shall no ASME Section VIII, Divisi hall be designed for maxin gear box, if any) at valve	operating torque requinessure corresponding t exceed the maxim on I. In case of pow mum output torque of stem.
5.0	INSPECTION AND TESTS		
5.1	The Manufacturer shall perform a this specification and the releval inspection and tests shall be, but r	all inspection and tests as nt codes, prior to shipme not limited to, the following	s per the requirements ent, at his works. Sເ ເ:
5.1.1	All valves shall be visually inspect shall be free from any strikes, gou shall be thoroughly cleaned and fr	ed. The internal and extern ges and other detrimental ee from dirt, rust and scal	nal surfaces of the valv defects. The surfaces es.
5.1.2	Dimensional check on all valves s drawings.	shall be carried out as per	the Purchaser approv
5.1.3	Chemical composition and mecha material standards and this specifi	anical properties shall be cation, for each heat of st	checked as per relev eel used.
5.1.4	Non-destructive examination of in of, but not limited to castings, forg by the Manufacturer.	dividual valve material an ings, plate and assembly	d components consist welds shall be carried
a)	Body castings of all valves shall be surface of critical areas as per AS shall be as per ASME B16.34. Th	e radiographically examine ME B16.34. Procedure ar e extent of radiography sh	ed on 100% of the nd acceptance criteria nall be as follows:
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ANSI Pressure Rating	Valve Size	Extent of Radiography
150 #	All sizes	Nil
300 #	<u><</u> DN 400mm (16") <u>></u> DN 450mm (18")	Nil 100%
<u>></u> 600 #	All sizes	100%

All castings shall be wet magnetic particle inspected 100% of the internal surfaces. Method and acceptance shall comply with ASME B.16.34.

b) All valves, with body fabricated from plates or made by forgings, shall be ultrasonically examined in accordance with the procedure and acceptance standard of Annexure E of ASME B16.34.

All forgings shall be wet magnetic particle inspected 100% of the internal surfaces. Method and acceptance shall comply with ASME B 16.34

- c) Bodies and bonnets made by welded assembly of segments of castings, forgings, plates or combinations thereof shall be examined, as applicable, by methods of clause 5.1.4 a) for cast components or clause 5.1.4 b) for forged components and plates.
- 5.1.5 Full inspection by radiography shall be carried out on all welds of pressure containing parts. Acceptance criteria shall be as per ASME B 31.4 or ASME B31.8, as applicable, and API 1104.
- 5.1.6 Welds, which in Purchaser's opinion cannot be inspected by radiographic methods, shall be checked by ultrasonic or magnetic particle methods and acceptance criteria shall be as per ASME Section VIII, Division 1, Appendix 12 and Appendix 6, respectively.
- 5.1.7 a) All finished wrought weld ends subject to welding in field shall be 100% ultrasonically tested for lamination type defects for a distance of 50mm from the end. Laminations shall not be acceptable.
 - b) Weld ends of all cast valves subject to welding in field shall be 100% radiographically examined and acceptance criteria shall be as per ASME B16.34.
 - c) After final machining, all bevel surfaces shall be inspected by dye penetrant or wet magnetic particle methods. All defects longer than 6.35 mm are rejected, as are defects between 6.35 mm and 1.59mm that are separated by a distance less than 50 times their greatest length. Rejectable defects must be removed. Weld repair of bevel surface is not permitted.
- 5.1.8 All valves shall be tested in compliance with the requirements of API 6D. During pressure testing, valves shall not have sealant lines and other cavities filled with sealant, grease or other foreign material. The drain, vent and sealant lines shall be

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	either included in the hydrostation shall be held for at least 30 min testing. The body cavity self-reliev of this specification shall also be	c shell test or tested indep nutes. No leakage is perm eving feature meeting the re checked.	pendently. Test pressure issible during hydrostatic equirements of clause 4.8	
5.1.9	A supplementary air seat test as be carried out for all valves. A l sealant. No leakage is allowed.	s per API 6D (Annex B, Cl oubble tight seal is require Fest pressure shall be held	ause B.3.3, Type II) shall d without the use of any for at least 15 minutes.	
5.1.10	Manufacturer who intends biddin successful fire type-tests for valv API 6FA, as applicable in Valve [g, must submit at bid stage res in accordance with API Data Sheet.	e, certificate and report for -607/ BS EN ISO 10497 /	
	Failure to comply with this re Bidder's offer.	equirement shall be a ca	use of rejection of the	
5.1.11	Valves shall be subjected to Clause B.6) under hydraulic p corresponding to the valve press	Operational Torque Test a pressure equal to maxim ure class rating.	us per API 6D (Annex B, um differential pressure	
	For manual operator of all valve operate the valve does not exce specification.	es, it shall be established t ed the requirements stated	hat the force required to d in clause 4.22(c) of this	
5.1.12	Power actuated valves shall be to valve Manufacturer's works. At pressure and five Open-Close-O be performed on the valve actual shall be recorded during testing. that the opening and closing time issued for the purpose.	ested after assembly of the least five Open-Close-Ope pen cycles with maximum ator assembly. The time for If required, the actuator sh es are within the limits state	valve and actuator at the en cycles without internal differential pressure shall or Full Open to Full close nall be adjusted to ensure ed in Actuator Data Sheet	
	Hand operator provided on the a satisfactory manual over-ride per	ctuator shall also be check formance.	ed after above testing, for	
	These tests shall be conducted of the same size, rating and the the requirements, retesting / re Inspector.	on minimum one valve out actuator model / type. In ca jection of the lot shall be	of a lot of five (5) valves ase the tests do not meet decided by Purchaser's	
5.1.13	Subsequent to successful testin one (1) valve out of the total of Purchaser's Representative for o	ng as specified in clause & ordered quantity shall be r cyclic testing as mentioned	5.1.11 and 5.1.12 above andomly selected by the below :	
	a) The valve shall be subje maximum differential pres	ected to at least 100 Oper ssure corresponding to the	n-Close-Open cycles with valve rating.	
	b) Subsequent to the above supplementary air seat te	, the valve shall be subject st in accordance with claus	ed to hydrostatic test and e 5.1.8 and 5.1.9.	
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	In case this valve fails to pass the valves shall be selected random both valves pass these tests, all va that failed) shall be deemed accep tests, all valves shall be rejected Manufacturer.	ese tests, the valve shall by y and subjected to testin alves manufactured for th otable. If either of the two d or each valve shall be	be rejected and two mag g as indicated above e order (except the va valves fails to pass the tested at the option
	Previously carried out test of sim same has been carried out by Ma below and two sizes above the siz one rating lower of valve tested pre	nilar nature shall be cons anufacturer in last two ye ze of valve previously tes eviously, shall be qualified	sidered acceptable if ears. Valves of two siz ted, and rating similar
5.1.14	Checks shall be carried out to demonstrate that the dissimilar metal used in the valves are successfully insulated as per the requirement of clause 4.17 of the specification.		
5.1.15	When indicated in Valve Data Sheet, valves shall be subjected to anti-static testin as per supplementary test requirement of API 6D (Annex B, Clause B.5).		
5.2	Purchaser reserves the right to perindicated in clause 5.1 above Manufacturer shall give reasonab the Purchaser's Inspector.	erform stage-wise inspect at Manufacturer's wo le access and facilities r	ion and witness tests rks prior to shipme equired for inspectior
Purchaser reserves the right to require additional testing at any time to further investigate a suspected fault. The cost incurred shall be to Man account.			
	In no case shall any action of Pure his responsibility for material, desig	chaser or his Inspector re gn, quality or operation of	lieve the Manufacture valves.
	Inspection and tests performed/ w way relieve the Manufacturer's o tests.	vitnessed by the Purchas obligation to perform the	er's Inspector shall in required inspection a
6.0	EXTENT OF INSPECTION & TES	TING	
6.1	Purchaser's Inspector shall perform inspection and witness tests on all valves or a indicated in the Quality Assurance Plan (QAP) attached with this specification.		
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7.0	TEST CERTIFICATES		
7.1	Manufacturer shall submit the follo	wing certificates:	
	a) Mill test certificates relevention properties of the materials standards.	vant to the chemical a s used for valve construc	nalysis and mechanical ction as per the relevant
	b) Test certificates of hydrost timing and pressure of eac	tatic and pneumatic tests h test.	complete with records of
	c) Test reports on radiograph	and ultrasonic inspection	
	d) Test report on operation of 5.1.13 of this specification.	of valves conforming to c	lause 5.1.11, 5.1.12 and
	e) All other test reports an specification.	d certificates as require	ed by API 6D and this
	The certificates shall be valid only valves which have been certified be Manufacturer's works.	when signed by Purchase by Purchaser's Inspector	er's Inspector. Only those shall be despatched from
8.0	PAINTING, MARKING & SHIPMENT		
8.1	Valve surface shall be thoroughly cleaned, freed from rust and grease and applied with sufficient coats of corrosion resistant paint. Surface preparation shall be carried out by shot blasting to SP-6 in accordance with "Steel Structures Painting Council – Visual Standard SSPC-VIS-1". For valves to be installed underground, when indicated in Valve Data Sheet, the external surfaces of the buried portion of valves shall be painted with three coats of suitable coal tar epoxy resin with a minimum dry film thickness of 300 microns.		
8.2	Manufacturer shall indicate the type of corrosion resistant paint used, in the drawings submitted for approval.		
8.3	All valves shall be marked as per API 6D. The units of marking shall be metric except Nominal Diameter which shall be in inches. Marking shall be done by diestamping on the bonnet or on the housing. However, for buried valves, the marking shall be done on the above ground portion of the stem housing only.		
8.4	Valve ends shall be suitably protected to avoid any damage during transit. All threaded and machined surfaces subject to corrosion shall be well protected by a coat of grease or other suitable material. All valves shall be provided with suitable protectors, for flange faces, securely attached to the valves. Bevel ends shall be protected with metallic or high impact plastic bevel protectors.		
8.5	All sealant lines and other cavities shipment.	es of the valve shall be	filled with sealant before

	IITED STANDARD TECHNICAL SPECIFICATION OIL & GAS SBU, DELHI					
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			DOCUMENT NO.	Page 17 of 20		
TITLE		BALL VALVE	MEC/TS/05/21/002	REVISION : 1		
				EDITION : 1		
8.6	Pack	aging and shipping instruction	ns shall be as per API 6D.			
8.7	On p	ackages, following shall be m	arked legibly with suitable	e marking ink :		
	a) b) c) d) e)	Order Number Manufacturer's Name Valve Size and Rating Tag Number Serial Number				
9.0	<u>SPA</u>	RES & ACCESSORIES				
9.1	Manu requi inclu	Manufacturer shall furnish list of recommended spares and accessories for valves required during start-up and commissioning and supply of such spares shall be included in the price quoted by Manufacturer.				
9.2	Manufacturer shall furnish list of recommended spares and accessories required for two years of normal operation and maintenance of valves and price for such spares shall be quoted separately.					
9.3	Man	Manufacturer shall quote for spares & accessories as per Material Requisition.				
10.0	DOC	DOCUMENTATION				
10.1	At the time of bidding, Manufacturer shall submit the following documents:					
	a)	General arrangement / as positions and sizes of vents and other external parts to of valve & actuator.	sembly drawings showing s, drains, gear operator / a gether with overall dimer	g all features and relative actuator, painting, coating asions as well as weights		
	b)	Sectional drawing showing specification. In particular, furnished complying the re	g major parts with referen a blow-up drawing of ba quirement of clause 4.6 of	ce numbers and material Il-seat assembly shall be f this specification.		
	c)	Reference list of similar b years indicating all releva size, rating, service, etc.	oall valves manufactured int details including proje	and supplied in last five ect, year, client, location,		
	d)	Torque curves for the pow maximum allowable stem calculations shall also be s	er actuated valves along on torque. In addition, sin ubmitted for power actuat	with the break torque and zing criteria and torque ed valves.		
	e)	Descriptive technical catalo	ogues of the Manufacturer			

f) Copy of valid API 6D certificate.

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			EDITION : 1	
	g) Details of support foot, ir line to bottom of support f	cluding dimensions and di oot.	stance from valve centre	
	h) Quality Assurance Plan e accepted.	nclosed with this tender d	uly signed, stamped and	
	i) List of recommended spa	res required during start-up	and commissioning.	
	j) List of recommended sp maintenance.	ares required for 2 years	of normal operation and	
	k) Other documents / drawir	gs / data as per Material R	equisition.	
	 but not limited to, the following drawings, documents and specifications for Purchaser's final approval : a) Detailed sectional arrangement drawings showing all parts with reference numbers and material specifications as referred to in clause 10.1 above. 			
	 Purchaser's final approval : a) Detailed sectional arrangement drawings showing all parts with reference numbers and material specifications as referred to in clause 10.1 above. b) Assembly drawings with overall dimensions and features. Drawing shall also indicate the number of turns of hand wheel (in case of gear operators). 			
	required for operating the painting scheme. Comp applicable) shall be indica above.	e valve from full open to ful lete dimensional details ated in these drawings as i	ull close position and the of support foot (where referred to in clause 10.1	
	c) Welding, heat treatment a	nd testing procedures.		
	d) Procedure for cyclic testir	g.		
	e) Details of corrosion resist	ant paint to be applied on t	he valves.	
	f) Design calculation for pre	ssure containing parts.		
	g) Other documents / drawin	gs / data as per Material R	equisition.	
	Manufacture of valves sh indicated in clause 10.2a Purchaser, any changes be notified to Purchaser obtained before the valve	all commence only after a to 10.2c) above. Once ap n design, material and me whose approval in writing is manufactured.	oproval of the documents proval has been given by thod of manufacture shall of all changes shall be	
10.3	Within 2 weeks from the approvide copies of the approved drawings 10.2 above.	al date, Manufacturer shal , documents and specific	I submit to Purchaser six ations as listed in clause	

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TITLE	BALL VALVE	MEC/TS/05/21/002	REVISION : 1	
			EDITION : 1	
10.4	Prior to shipment, Manufacturer shall submit six hard copies and six soft copies (on CD-ROMs) of the following:			
	a) Test certificates as per clau	use 7.0 of this specification	n.	
	b) Manual for installation, erection, maintenance and operation instructions, including a list of recommended spares for the valves.			
	c) Other documents / drawing	s / data as per Material R	equisition.	
10.5	All documents shall be in English language.			
10.6	The above documents & data requirements shall also be supplemented by all requirements of clause 2.0 of the Material Requisition.			
11.0	GUARANTEE			
11.1	Manufacturer shall guarantee that the materials and machining of valves and fittings comply with the requirements in this specification and in the Purchase Order.			
11.2	Manufacturer is bound to replace or repair all valve parts which should result defective due to inadequate engineering or to the quality of materials and machining.			
11.3	If valve defect or malfunctioning cannot be eliminated, Manufacturer shall replace the valve without delay,			
11.4	Any defect occurring during the period of Guarantee shall be attended to by making all necessary modifications and repair of defective parts free of charge to the Purchaser as per the relevant clause of the bid document.			
11.5	All expenses shall be to Manufactu	irer's account.		



PROCESS & PIPING DESIGN SECTION MECON LIMITED



TECHNICAL SPECIFICATION FOR PLUG VALVES (NB $\geq 2^{"}$)

SPECIFICATION NO .: MEC/TS/05/62/003, Rev-2

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Gurdeep Singh	A.K. Sarkar	A.K. Johri	
Date	Date	Date Page 35 of 97	
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TECHNICAL SPECIFICATION NO. : MEC/TS/05/62/003

1.0 **SCOPE**

This specification covers the minimum requirements for design, manufacture and supply of carbon steel plug valves of size DN 50mm (2") and above and ANSI Class 150# thru 900# for use in onshore pipeline systems handling non sour hydrocarbons in liquid phase or gaseous phase including Liquefied Petroleum Gas (LPG).

2.0 **REFERENCE DOCUMENTS**

- 2.1 All valves shall be manufactured and supplied in accordance with the Twenty Second Edition, January, 2002, or the latest edition of American Petroleum Institute (API) Specification 6D, twenty first edition, 1994 including supplement 1 & 2 thereof with additions and modifications as indicated in the following sections of this specification.
- 2.2 Reference has also been made in this specification to the latest edition of the following Codes, Standards and Specifications :

ASME B 16.5	:	Pipe flanges and flanged fittings			
ASME B 16.25	:	Buttwelding ends			
ASME B 16.34	:	Valves – Flanged, threaded and welding end			
ASME B16.47	:	Large diameter steel flanges			
ASME B 31.3	:	Chemical & process plant piping system			
ASME B 31.4	:	Liquid transportation systems for hydrocarbons and other liquids			
ASME B 31.8	:	Gas transmission and distribution piping systems			
ASME Sec.VIII	:	Boiler and pressure vessel code			
ASTM A 370	:	Standard test methods and definitions for mechanical testing of steel products			
ASTM B 733	:	Autocatalytic nickel phosphorous coating on metals			
API 6FA	:	Fire test for valves			
API 1104	:	Welding of pipelines and related facilities			
BS:6755 (Part-II)	:	Testing of valves – Specification for fire type - testing requirements			
MSS-SP-6	:	Standard finishes for contact faces of pipe flanges and connecting-end flanges of valves and fittings			
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	MSS-SP-44	: St	eel pipeline	flanges	al standard
2.3	In case of a Codes, Stand this specificati Data S Data S API 61 Other	conflict between t ards and Specificat on shall govern. Or Sheets pecification D Specification Referred Codes &	he requirem ons referred der of prece	ents of this specificati in clause 2.2 above, dence shall be as follow	on, API 6D and the the requirements of <i>is</i> :
2.0	Manufacturer's Standard				
3.0			f the velue		in Volue Data Chard
3.1	Material for h Other compo approval by P	najor components c nents shall be as urchaser.	per Manufac	shall be as indicated cturer's standard which	n valve Data Sheet. h will be subject to
3.2	Carbon steel used for the manufacture of valves shall be fully killed.				
3.3	Chemical com further weldin used: a) Carbon b) Manga c) Silicon d) Phosp e) Sulphu Total percent elements shal a) Nitrog b) Nickel c) Coppe d) Alumir e) Chrom f) Molybu	nposition (check ar g by Purchaser sha n : anese : horus : ur : 0.0 age of Vanadium, I not exceed the foll en : ur : num : hum : hum : denum :	alysis) of va I meet the fo 0.22% 1.70 % 0.55 % 0.030 % 0.30 % (max. Niobium and owing limits 0.019 % 0.30 % 0.20 % 0.20 % 0.070 % 0.15 % 0.05 %	alve end connection v ollowing requirements f (max.) (max.) 6 (max.) 6 (max.) 1 Titanium shall not ex 6	which are subject to for each heat of steel
	Carbon equiva	alent (CE) as calcula	ted by the fo	llowing shall not excee	d 0.45%.
	CE = C + ·	Mn Cr	+ Mo + V	Ni + Cu +	
		6	5	15	
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3.4 For valves specified for Gas Service or high vapour pressure liquid service, charpy V-Notch test on each heat of base material shall be conducted as per API 6D, for all pressure containing parts such as body, end flanges and welding ends as well as the bolting material for pressure containing parts. Unless specified otherwise in Valve Data Sheets, the Charpy impact test shall be conducted at 0°C. The Charpy impact test specimen shall be taken in the direction of principal grain flow and notched perpendicular to the original surface of plate or forging.

Unless specified otherwise in Valve Data Sheets, the minimum average absorbed energy per set of three specimens shall be 27 J with an individual minimum per specimen of 22 J.

- 3.5 For valves specified for Gas Service or high vapour pressure liquid service, the hardness of base material of body and principal parts of the valve such as plug, stem, etc., shall not exceed 22 RC.
- 3.6 Plug for valve size DN 200mm (8") and above or as specified in Valve Data Sheets shall have Electroless Nickel Plating (ENP) or equivalent. The hardness of plating shall be minimum 50 RC. Manufacturer shall ensure that the adhesive strength of plating is sufficient so as to prevent peeling of plating during operation of the valve.
- 3.7 All process-wetted parts, metallic and non-metallic, shall be suitable for the fluids and service specified by the Purchaser. The service gas composition when applicable shall be as given in Annexure-I.

4.0 DESIGN & CONSTRUCTION

- 4.1 The Manufacturer shall have a valid license to use API 6D monogram for manufacture of Plug Valves.
- 4.2 Valve pattern shall be short, regular or venturi as specified in the following table:

Class	Size Range, NB mm (inch) Pattern
	50-100 (2-4)	Short
150	150-300 (6-12)	Regular
	350 (14) & above	Venturi
	50-100 (2-4)	Short
300	150-250 (6-10)	Regular
	300 (12) & above	Venturi
	50-250 (2-10) F	Regular
600	300 (12) & above	Venturi
	50-250 (2-10) F	Regular
900	300 (12) & above	Venturi

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4.3 Valve shall have an inherent feature using line pressure to ensure that the line pressure cannot cause taper locking of the plug/ plug movement into taper i.e. valves shall be of pressure balanced design. Cover shall be bolted to the body and screwed connections are not acceptable. 4.4 4.5 Soft seats to achieve a seal between plug and body are not permitted. 4.6 All valves shall have provisions for secondary sealant injection under full line pressure for seat and stem seals. Sealant injection points shall be provided with a ball type check valve or needle valve to replace the sealant injection fitting under full line pressure. 4.7 Valves shall have vent and drain connections as per API 6D. 4.8 When specified in the Valve Data Sheet, valves shall be designed to withstand a sustained internal vacuum of at least one milli-bar in both open and closed position. 4.9 Valve design shall ensure repair of gland packing under full line pressure. 4.10 Valve ends shall be either flanged or butt welded or one end flanged and one end butt a) welded as indicated in Valve Data Sheet. Flanges of the flanged end cast/ forged body valves shall be integrally cast/forged with the body of valve. Face-to-face/ end-to-end dimensions shall conform to API 6D. b) Flanged end shall have dimensions as per ASME B16.5 for valve sizes upto DN 600mm (24 inches) excluding DN 550mm (22 inches) and as per MSS-SP-44 for valve sizes DN 550mm (22 inches) & for DN 650mm (26 inches) and above. Flange face shall be either raised face or ring joint type as indicated in Valve Data Sheet. Flange face finish shall be serrated or smooth as indicated in Valve Data Sheet. Smooth finish when specified shall be 125 to 200 AARH. In case of RTJ flanges, the groove hardness shall be minimum 140 BHN. Butt weld end preparation shall be as per ASME B16.25. The thickness of the pipe to c) which the valve has to be welded shall be as indicated in Valve Data Sheet. Valves shall be without transition pups. In case significant difference exists between thickness of welding ends of valve and connecting pipe, the welding ends of valve shall have bevel preparation as per ASME B31.4 or ASME B31.8, as applicable. 4.11 Valves shall be provided with position indicator and stops at the fully open and fully closed positions. 4.12 Valves of size DN 200mm (8") and above shall be equipped with lifting lugs. Tapped holes and eye bolts shall not be used for lifting lugs. 4.13 Valves shall have locking devices to be locked either in full open or full close position when indicated in the Valve Data Sheets. Locking devices shall be permanently attached to the valve operator and shall not interfere with operation of the valve.

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- 4.14 Valves shall be of fire safe design as per BS:6755 (Part-II)/ API 6FA, if indicated in Valve Data Sheet.
- 4.15 Valves shall be suitable for either buried or above ground installation as indicated in the Valve Data Sheet.
- 4.16 Valves with stem extension, when indicated in Valve Data Sheet shall have following provisions :
 - a) Valves provided with stem extension shall have water proof outer casing. Length of stem extension shall be as indicated in the Valve Data Sheet. The length indicated corresponds to the distance between the centreline of the valve opening and the top of the mounting flange for valve operating device (gear operator/ power actuator as applicable).
 - b) Vent and drain connections shall be terminated adjacent to the valve operator by means of suitable piping anchored to the valve body. Pipe used shall be API 5L Gr. B/ ASTM A106 Gr. B, with Sch. 160. Fittings shall be ASTM A105/ ASTM A 234 Gr. WPB, Socket Welded, ANSI class 6000.
 - c) Sealant injection lines shall be extended and terminated adjacent to the valve operator in manner as indicated in (b) above.
 - d) Stem extension and stem housing design shall be such that the complete assembly will form a rigid unit giving a positive drive under all conditions with no possibility of free movements between valve body stem extension or its operator.
 - e) Outer casing of stem extension shall have 3/8" or 1/2" NPT plugs at the top and bottom, for draining and filling with oil to prevent internal corrosion.

4.17 **Operating Devices**

- a) Valves shall have a power actuator or manual operator as indicated in the Valve Data Sheet. Manual operated valves of size ≤ DN 100mm (4") shall be wrench operated and valves of sizes ≥ DN 150mm (6") shall be gear operated. Each wrench operated valve shall be supplied with wrench. Valve design shall be such that damage due to malfunctioning of the operator or its controls will only occur in the operator gear train or power cylinder and damaged parts can be replaced without the bonnet being removed.
- b) The power actuator shall be in accordance with the specification issued for the purpose and as indicated in the valve and actuator data sheet. Operating time shall be as indicated in valve data sheet. Valve operating time shall correspond to full close to full open / full open to full close under maximum differential pressure corresponding to the valve rating. For actuated valves, the actuator torque shall be atleast 1.25 times the maximum torque required to operate the valve under maximum differential pressure corresponding to the valve corresponding to the valve actuator torque shall be atleast 1.25 times the maximum torque required to operate the valve under maximum differential pressure corresponding to the valve class rating.
- c) Operating device shall be designed for easy operation of valve under maximum differential pressure corresponding to the valve rating.

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	d) For ma of ope total f shall a require	anual operation of all valverating lever shall be such orce required to operate ilso indicate the number ad to operate the valve from the val	ves, the that un the va of turns om full o	e diameter of the hand der the maximum diffe lve does not exceed 3 s of hand wheel (in ca open to full close posit	wheel or the length erential pressure, the 350 N. Manufacturer se of gear operator), ion.	
	e) Directi while o	on of operation of hand closing the valve. Hand wl	wheel heels sh	or wrench shall be in hall not have protruding	clock-wise direction g spokes.	
	f) Gear o encase be fille	operators, if specified, sha ed in waterproof/ dustpro ed with suitable grease.	all have of/ wea	e a self locking provisi atherproof/ splashproo	on and shall be fully f enclosure and shall	
4.18	Repair by weld by welding as out before any shall also inclu of this specific	ding is not permitted for fa per ASME B16.34 is perm y heat treatment of castir ude impact test and hardr ation and shall meet the r	abricate nitted fo ng is do ness tes requirer	ed and forged body val or cast body valves. R ne. Repair welding pr st when required as pe ments as specified ther	ves. However repair epair shall be carried ocedure qualification or Clause 3.4 and 3.6 ein.	
4.19	The tolerance valves shall be	The tolerance on internal diameter and out of roundness at the ends for welded ends valves shall be as per connected pipe specification as indicated in the Valve Data Sheet.				
4.20	Valve stem sh operate the va class rating. specified in AS	alve stem shall be capable of withstanding the maximum operating torque required to perate the valve against the maximum differential pressure corresponding to applicable lass rating. The combined stress shall not exceed the maximum allowable stresses pecified in ASME section VIII, Division-1.				
	For Power Act of the selected	r Power Actuated Valves, the valve stem shall be designed for maximum output torque the selected power actuator (including gear box, if any) at the valves stem.				
5.0	INSPECTION	<u>N & TESTS</u>				
5.1	The Manufact specification a tests shall be,	urer shall perform all ins and the relevant codes, pr but not limited to, the fol	pection ior to s lowing	and tests as per the hipment at his works.	requirements of this Such inspection and	
5.1.1	All valves shal	l be visually inspected.				
5.1.2	Dimensional c	heck shall be carried out a	as per t	he Purchaser approved	d drawings.	
5.1.3	Chemical con material stand	nposition and mechanica ards and this specification	al prop , for ea	erties shall be check ch heat of steel used.	ed as per relevant	
5.1.4	a) Non-d consis be car	estructive examination ting of but not limited to o ried out by the Manufactu	of ind castings irer.	lividual valve materi s, forgings, plates and	al and component assembly welds shall	
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	b) Valve seat Proc radio	es castings shall location, flanged edure and accep paraphy shall be a	be radiogra body end otance crite as follows :	aphicall Is and eria sha	y examined a circumference Il be as per a	t the cov e of ends ASME B1	er and body portion, s to be field welded. 16.34. The extent of
	ANS	Class 150-	All Sizes		-	Nil	
	ANS	l Class 300-	≤ DN 400 ≥	0mm (1 : DN 45	6") - 0mm (18")	Nil -	100%
	ANS and	l Class 600- above	All Sizes		-	100%	
	All o surfa	astings shall be aces. Method and	e wet mag Lacceptanc	jnetic p ce shall	oarticle inspect comply with A	cted 100 ASME B10) % of the internal 5.34.
	c) Valvo acce	e forgings shall b ptance criteria sh	e examine nall be as p	d by ulf er Anne	trasonic methe exure E of ASN	od. Inspe /IE B16.3	ection procedure and 4.
5.1.5	Areas which methods sh criteria sha respectively.	which, in Purchaser's Inspector's opinion, cannot be inspected by radiographic ds shall be checked by ultrasonic or magnetic particle methods and acceptance shall be as per ASME Sec-VIII, Division I, Appendix 12 and Appendix 6 tively.					
5.1.6	a) Weld acce b) After wet and less pern c) All f ultra end.	I ends of all ca ptance criteria sh final machining magnetic particle also defects betw than 50 times nitted. Rejectable nished wrought sonically tested f Laminations sha	ast valves nall be as p all bevel methods. veen 6.35r their great defects m weld end for laminat Il not be ac	shall I er ASM surface Any de nm and cest Ien ust be r s subje ion type cceptabl	be 100% rad E B16.34. s shall be ins fects longer th 1.59mm that gth. Weld re removed. ct to welding e defects for a le.	diographi pected k nan 6.35 t are sep pair of 1 n the a distanc	cally examined and by dye penetrant, or mm shall be rejected barated by a distance bevel surface is not field shall be 100% e of 50mm from the
5.1.7	All valves sh shell testing necessary, t drain, vent a independent	ves shall be tested in compliance with the requirements of API 6D. Hydrostatic esting shall ensure that the whole of the shell is subjected to the test pressure. If ary, the empty shell shall be pressure tested prior to assembly of the plug. The vent and sealant lines shall be either included in the hydrostatic shell test or tested indently. No leakage is permissible during hydrostatic testing.					
5.1.8	A supplemen is allowed. T	ntary air seat tes est pressure sha	t as per AP Il be held f	I 6D sh or at lea	all be carried ast 15 minutes	out for a	ill valves. No leakage

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5.1.9 Manufacturer who intends bidding must submit at bid stage, certificate and report for successful fire safe tests for all types of valves in accordance with BS:6755 (Part-II)/ API 6FA, as applicable in Valve Data Sheet.

Failure to comply with the requirement shall be a cause of rejection of the offer.

- 5.1.10 Valve shall be subjected to Operational Torque Test as per supplementary test requirement of API 6D under hydraulic pressure equal to the maximum differential pressure corresponding to the valve rating. The maximum handwheel force shall not exceed 350 N.
- 5.1.11 Power actuated valves shall be tested after assembly at the valve Manufacturer's works. Actuator shall be capable to allow minimum five consecutive "opening" and "closing" cycles. To achieve this, the Manufacturer shall provide "closing" and "opening" operations. This test shall be conducted on one valve out of a lot of five valves of the same size, rating and actuator type. In case the test result dose not meet the requirements, retesting/ rejection of the lot shall be as decided by Purchaser's Inspector.

The actuator shall be adjusted to ensure that opening and closing time is within the limits stated in Actuator Data Sheet issued for the purpose.

The hand operator installed on the actuator shall also be checked after the cyclic testing, for satisfactory manual over-ride performance.

5.2 Purchaser reserves the right to perform stagewise inspection and witness tests as indicated in para 5.1 at Manufacturer's works prior to shipment. Manufacturer shall give reasonable access and facilities required for inspection to Purchaser's Inspector.

Purchaser reserves the right to request additional testing at any time to confirm or further investigate a suspected fault. If the suspected fault is confirmed, the cost incurred shall be to Manufacturer's account.

In no case shall any action of Purchaser or his representative relieve the Manufacturer of his responsibility for material, design, quality or operation of valves.

Inspection and tests performed/ witnessed by the Purchaser's Inspector shall in no way relieve the Manufacturer's obligation to perform the required inspection and tests.

6.0 EXTENT OF INSPECTION & TESTING

- 6.1 Purchaser's Inspector shall perform inspection and witness test on all valves as indicated in the Quality Assurance Plan (QAP) attached with this specification.
- 6.2 The hydrostatic testing and cyclic opening and closing of the valves with the operator shall be witnessed by Purchaser's Inspector.

7.0 **TEST CERTIFICATES**

- 7.1 Manufacturer shall submit the following certificates :
 - a) Mill test certificates relevant to the chemical analysis and mechanical properties of the materials used for valve construction as per the relevant standards.
 - b) Test certificates on hydrostatic and pneumatic test complete with records of timing and pressure of each test.
 - c) Test reports conforming to clause 5.1.9 of this specification, if applicable.
 - d) Test reports on radiographic and ultrasonic inspection.
 - e) Test reports on operation of valves conforming to clause 5.1.10 and 5.1.11 of this specification.
 - f) All other test reports and certificates as required by API 6D and this specification.

The certificates shall be valid only when signed by Purchaser's Inspector. Only those valves which have been certified by Purchaser's Inspector shall be dispatched from Manufacturer's works.

8.0 PAINTING, MARKING & SHIPMENT

- 8.1 Valve surface shall be thoroughly cleaned, freed from rust and grease and applied with sufficient coats of corrosion resistant paint. Surface preparation shall be carried out by shot blasting to SP 6 in accordance with "Steel Structures Painting Council Visual Standard SSPC-VIS-1". For the valves to be installed underground, when indicated in Valve Data Sheet, external surfaces of the buried portion of valves shall be painted with three coats of suitable coal tar epoxy resin with a minimum dry film thickness of 300 microns.
- 8.2 Manufacturer shall indicate the type of corrosion resistant paint used, in the drawings submitted for approval.
- 8.3 All valves shall be marked as per API 6D. The units of marking shall be metric except Nominal Diameter which shall be in inches. Marking shall be done by die-stamping on the bonnet or on the housing. However for buried valves the marking shall be done on the above ground portion of the stem housing only.
- 8.4 Valve ends shall be suitably protected to avoid any damage during transit. All threaded and machined surfaces subject to corrosion shall be well protected by a coat of grease or other suitable material. All valves shall be provided with suitable protectors, for flange faces, securely attached to the valves. Bevel ends shall be protected with metallic bevel protectors.

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- 8.5 All sealant lines and other cavities of the valves shall be filled with sealant before shipment.
- 8.6 Packaging and shipping instructions shall be as per API 6D.
- 8.7 Packages shall be marked legibly, with suitable marking ink, the following.
 - a) Order Number
 - b) Manufacturer's Name
 - c) Valve Size and Rating
 - d) Tag Number
 - e) Serial Number

9.0 SPARES & ACCESSORIES

- 9.1 Manufacturer shall recommend and quote separately the spares for valves required for commissioning and two years of normal operation. List of such spares without price shall be indicated alongwith technical bid and separately with price.
- 9.2 Manufacturer shall recommend and quote unit price separately for the accessories (like wrench, sealant injector, etc.), sealant and special tools required for maintenance of valves.

10.0 DOCUMENTATION

- 10.1 At the time of bidding, the bidder shall submit the following documents :
 - General arrangement/ assembly drawings showing all features and relative positions & sizes of vents, drains, gear box & other external parts together with overall dimensions.
 - b) Sectional drawing showing major parts with reference numbers and material specification.
 - c) Reference list of similar plug valves manufactured and supplied in last five years, indicating all relevant details including project, year, client, location, size rating, service, etc.
 - d) Torque curves for the power actuated valves alongwith break torque and maximum allowable stem torque. In addition, sizing criteria and torque calculations shall also be submitted for power actuated valves.
 - e) Descriptive technical catalogues of the Manufacturer.
 - f) Copy of valid API 6D certificate, wherever applicable.

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- g) Details of support foot, including dimensions and distance from valve centre line to bottom of support foot.
- h) Quality Assurance Plan enclosed with this tender duly signed, stamped and accepted.

IMPORTANT

The drawings to be submitted alongwith the bid shall be in total compliance with the requirement of technical specification and data sheets of the valves with no exception & deviation.

- 10.2 Within two weeks of placement of order, the manufacturer shall submit six copies of, but not limited to, the following drawings, documents and specifications for approval :
 - a) Design drawings and relevant calculations for pressure containing parts and other principle parts.
 - b) Detailed sectional arrangement drawing showing all parts with reference numbers and materials specification.
 - c) Assembly drawings with overall dimensions & clearances required and showing all features. Drawing shall also indicate the numbers of turns of handwheel (in case of gear operator) required for operating the valve from full open to full close position and the painting scheme.
 - d) Welding, heat treatment, testing and quality control procedures.
 - e) Details of corrosion resistant paint to be applied on the valves.
 - f) Design calculation for pressure containing parts.

Manufacture of valves shall commence only after approval of the above documents. Once approval has been given by Purchaser, any change in design, material and method of manufacture shall be notified to the Purchaser, whose approval in writing for all changes shall be obtained before the valves are manufactured.

- 10.3 Within 30 days from the approval date, Manufacturer shall submit one reproducible and six copies of the approved drawings, documents and specification as listed in clause 10.2 of this specification.
- 10.4 Prior to shipment, Manufacturer shall submit one reproducible and six copies of following
 - a) Test certificates as listed in clause 7.0 of this specification.
 - b) Manual for installation, erection instructions, maintenance and operation instructions, including a list of recommended spares for the valves.
- 10.5 All documents shall be in English Language.

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11.0 **GUARANTEE**

- 11.1 Manufacturer shall guarantee that the materials and machining of valves and fittings comply with the requirements in this specification and in the Purchase Order.
- 11.2 Manufacturer is bound to replace or repair all valve parts which should result defective due to inadequate engineering or to the quality of materials and machining.
- 11.3 If valve defect or malfunctioning cannot be eliminated, Manufacturer shall replace the valve without delay.
- 11.4 Any defect occurring during the period of Guarantee shall be attended to by making all necessary modifications and repair of defective parts free of charge to the Purchaser as per the relevant clause of the bid document.
- 11.5 All expenses shall be to Manufacturer's account.

Rev. :	0	
Edition	: 1	

TECHNICAL SPECIFICATION

FOR

GAS POWERED VALVE ACTUATORS

SPECIFICATION NO.: MEC/TS/05/E5/002A



ELECTRICAL & INSTRUMENTATION (OIL & GAS SBU) MECON LIMITED DELHI 110 092

03.01.2015	Lakshi	qjain	Shulf
-	Sakshi Wadhawan	Vikas Jain	Rakesh Kr. Shukla
Date	Prepared By	Checked By	Approved By

MECON LIMITED	STANDARD TECHNICAL SPECIFICATION		
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ATTACHMENTS

- SKETCH-1
- SKETCH-2
- GAS COMPOSITION (attached elsewhere in tender document)
- PHILOSOPHY FOR AUTO-CLOSURE OF VALVES

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1.0 <u>SCOPE</u>

- 1.1 This specification, together with the applicable data sheet, covers the minimum requirements for the design, manufacture, inspection, testing and shipping of valve actuators complete with accessories for quarter turn ball/ plug valves.
- 1.2 This specification indicates the minimum supply requirements and does not relieve the vendor from his responsibilities concerning the design and the safe operation of the supplied equipment.
- 1.3 The valve manufacturer shall also be responsible for proper operation of the actuator that shall develop a torque or a thrust sufficient to conveniently open and close the valve always with in the limits established by the resistance of the mechanical elements of the valve itself.
- 1.4 Valve and actuator shall be supplied as a single assembly complete in all respect and ready for installation at site.

2.0 <u>REFERENCE DOCUMENTS</u>

Reference is made in this specification to the latest edition of the following codes, standards and specifications:

Codes and Standards

ASME B31.8	:	Gas Transmission and Distribution Piping Systems
ASME B16.5	:	Steel Pipe Flanges and Flanged Fittings
ASME Sec. VIII	:	Boiler and Pressure Vessels, Code.
ANSI B2.1	:	Pipe Threads, General Purpose
NEC	:	National Electric Code
IEC	:	International Electro-technical Commission
NEMA	:	National Electrical Manufacturers Association

In case of conflict between the requirements of this specification and above referred documents, the requirements of this specification shall govern.

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3.0 <u>ACTUATOR SIZING</u>

- 3.1 For sizing the actuator, valve manufacturer shall furnish to the actuator manufacturer the following information:
 - a) The maximum break away torque or thrust required at the valve stem with manual/ remote operation to open and close a valve at the shut off pressure in the line. The actuator shall be sized at pressure indicated in Table-2 of datasheet and meeting the safety factor of 1.25 as required by the valve operation at the shut-off pressure in the line.
 - b) The temperature correction factor.
 - c) The pressure correction factor.
 - d) As a result of points (a) to (c) the minimum required torque or thrust output of the actuator.
 - e) Maximum allowable torque or thrust output of the actuator depending on the type and size of valve.
- 3.2 The maximum time required to open and close a ball valve shall be as indicated in the data sheet.
- 3.3 Actuator manufacturer shall provide the complete model no. decoding for actuators, limit switches and solenoid valves.
- 3.4 Complete details of Gas/ Hydraulic circuit with complete sequencing of port from open to close and close to open position shall be furnished in the offer for review.
- 3.5 Manufacturer shall furnish the detailed calculation for actuator sizing after placement of order. The calculation so furnished by manufacturer shall satisfy the sizing criteria as per above clauses. Manufacturer shall agree to upgrade the actuators offered to meet the sizing criteria without any price and schedule impact.

4.0 DESIGN FEATURES

4.1 The actuators shall be powered by Natural Gas from the main pipeline. The gas powered actuator shall operate at pressure indicated in Table-2 of datasheet. A typical scheme for tapping the gas from mainline with pressure reduction is shown in Sketch-1. Actuator electrical/ hydraulic circuit shall be developed as per the Sketch-2 enclosed.

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4.2	Actuator shall be direct gas operated scotch yoke type with manual hydraulic override. The actuator shall be provided with a hydraulic pump for manual operation. If there is no gas pressure available to actuator it shall be possible to actuate Direct Pneumatic Actuator by means of Nitrogen bottles or similar pressure source. Actuator manufacturer shall furnish the capacity and set pressure of nitrogen bottle for at least two opening and two closing strokes of the actuator.			
4.3	The actuator shall be suitable for g specified in data sheets. The present of the Actuator.	The actuator shall be suitable for gas operating conditions and ambient temperature as specified in data sheets. The presence of methanol in the gas shall not affect the service of the Actuator.		
4.4	All materials in contact with natural gas shall be suitable for the gas composition attached with this specification.			
4.5	The actuator and its accessories shall be suitable; for outdoor installation and have weatherproof enclosure as per NEMA 4 or equivalent.			
	All compartments and housing containing electrical devices such as switches, contactors, relay, fuses, terminal box etc. shall be explosion proof suitable for NEC Class 1 Div. 2 Gr. C & D, T3 or equivalent. The cable glands shall be 1" NPT thread. The unused cable entries must be plugged off with solid metal plugs.			
	Solenoid valves shall be of explosion proof design certified for NEC Class 1 Div. 2 Gr. C & D, T3 or equivalent with moulded continuous duty coils and stainless steel valve body.			
4.6	All pressure containing parts shall b	e designed to ASME Section	VIII.	
4.7	a) The actuator shall be suitable for direct mounting to the valve without changing the standard top works of the valve and shall have the capability to be mounted or removed from the valve when the valve is in service. The actuator shall be flanged and bolted directly on the valve body or extension. The connection between actuator and the valve or between the operators, the outer casing of the extension and the valve shall be such that there is no movement between these connections when the valve is actuated by the actuator under any load.			
	b) Actuator shall be suitable for specified in the data sheet.	r installation on a vertical	stem unless otherwise	
4.8	Provision shall be made to prevent a	accidental pressure build up in	n the actuator.	
4.9	The construction of the actuator operation and maintenance can be being injured by moving parts.	and its controls shall be su carried out by skilled perso	uch that proper manual nnel without the risk of	

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4.10	A position indicator on the actuator open positions.	shall show the valve in the	open, closed or partially
4.11	Bearings shall be factory packed w for the life of the actuator.	ith grease and shall not requ	ire additional lubrication
4.12	Unless specified otherwise in the ovalves, which immediately shut off of its end positions.	data sheet, the actuator shall the gas supply to actuator wh	be equipped with limit then the valve reaches one
4.13	Actuator shall be provided with pr The pressure gauges for the hydrau system.	essure gauges for pneumatic ilic system shall be in circuit	e and hydraulic systems. t with the pressure relief
4.14	In selection of pressure regulator due consideration shall be given to the effect of cooling of gas at the regulator and its down stream section.		
4.15	A high pressure dehydrating filter cartridge shall be provided to remove condensate, moisture, foreign particles and any corrosive contaminants from pipeline gas.		
4.16	The sound level of the gas escaping into the atmosphere when the actuator is in operation shall not exceed 90 dBA, measured at a distance of 10 meters.		
4.17	The actuator shall be operated by either of the following two methods:		
	a) For the remote control, the actuator shall have a solenoid valve, limit switches, relays, etc. and shall be suitable for remote and local operation as per description in the attached Actuator Data Sheet(s). Electrical signal supplied is a momentary type with 1 sec duration signal, Actuator shall have a self retaining system of the above signal in its control circuit.		
	b) For the local-control the actuator shall be suitable for local operation with line gas feed lines or through nitrogen bottles. The devices and accessories, which do not require the electricity for their operation, shall be provided in the actuators as per this specification. The actuators shall have a hand pump in conjunction with the oil circuit to achieve local control with hydraulic shock functionality.		
4.18	The actuators shall be provided with limit switches for open and close positions. The position of switches shall be adjustable near the valve open and close positions. The limit switches shall be wired up to terminal block and shall be numbered for proper identification. The limit switches shall have 2 sets of contacts for each open and close position. The contact rating shall be as specified in the data sheet. The power to solenoid valves shall be cut-off when the actuator has travelled to extreme positions (close and open).		

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4.19	The limit switches shall be wired in the actuator control circuit by the vendor so as to cut off power to the actuator once the end positions of the valve are reached. This is required to de-energize the solenoid valves in the steady state condition and failure of electrical power will not affect the valve position.		
4.20	The stroke of the Actuator shall Ball/ Plug Valves.	be easily adjustable in step	s of maximum 0.5° for
4.21	Speed control nozzles for adjust provided.	ing the valve speed over	a wide range shall be
4.22	If remote control is required, a local/ remote switch shall be installed to prevent remote control during maintenance work. This switch shall be provided with a hole 12 mm in diameter for locking with pad lock in either position. This local/ remote switch shall be wired up to the junction box as per circuit diagram.		
	All control accessories, pneumatic and hydraulic, shall be mounted in an enclosure and shall be fully wired and tubed. The enclosure shall be weatherproof as per NEMA-4 or equivalent.		
4.23	All bleed and vent connections wherever required shall be piped outside the actuator cabinet so as to prevent gas pocketing inside the actuator cabinet. The actuator shall be of an automatic self purging design such that any gas pocket in the actuator will be eliminated.		
4.24	Vendor shall be responsible for integrating the potential free NO or NC contacts of Remote Telemetry Unit (RTU's) for open and close command in interlock circuit. These commands will be of momentary type with 1 sec duration.		
4.25	All mounting accessories needed for installing the actuator, tanks etc. are in manufacturer's scope of supply.		
4.26	The interconnecting cabling, interconnecting pipe work between the actuator and the valve, adapters, tubing, cable glands, junction box are in manufacturer's scope of supply.		
4.27	The actuator shall be supplied totally self-contained, wired, tubed and mounted on ball valve. In case of a separate control box, wiring and tubing between control box and actuator is in the vendor's scope. Three meters of $\frac{3}{4}$ " tubing set including all connectors between the actuator and the control box and three meters of interconnecting piping work upstream & downstream of the valve and the control box be provided. Owner shall provide 20mm ($\frac{3}{4}$ ") SW tapping on process main line for line gas tapping.		
4.28	Threading connections shall be NPT as per ANSI B2.1 and flange connection as per ANSI B16.5. The tubing, fittings and valves shall be stainless steel with Swage Lock		

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	fittings or equivalent.		

5.0 <u>COATING</u>

The actuator, including gear boxes and piping, shall be coated as described below :

- 5.1 Removal of all rust by means of emery cloth or wire brush.
- 5.2 Short blast as per Swedish Standard No. SIS 055900 latest edition SA 2.5 one layer Primer Epoxy – Polyamide DFT 75 microns intermediate layer Epoxy – Polyamide DFT 25 microns, final layer Epoxy – Polyamide DFT 75 microns. Total DFT 175 microns and colour RAL 5012 (light blue).

6.0 <u>INSPECTION AND TESTS</u>

- 6.1 Test at the Actuator Manufacturer's Shop
 - a) Electrical and mechanical operating tests.
 - b) Seal test of hydraulic circuits.
 - c) Check of required functions.
 - d) Check of operating time control.
 - e) Check of limiting device operation.
 - f) Check of actuator torque or thrust.
- 6.2 Test at the Valve Manufacturer's Shop
 - a) Test and check covered by point 6.1 after assembly with ball/ plug valve.
 - b) No load test (DP=0) or load (DP max) Operations with the minimum required feeding pressure (pressure indicated in Table-2 of datasheet).
 - c) Check of the limiting device operation.
 - d) Various tests on the valve according to provisions of specific documentation.
 - e) Testing shall conform to actual field operating conditions.
- 6.3 All actuators shall be visually inspected.

6.4 Dimensional check on actuators shall be carried out as per the Purchaser approved Page 55 of 97

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drawings.

6.5 Purchaser reserves the right to perform inspection as indicated above at Manufacturer's works prior to shipment. Manufacturer shall give reasonable access and facilities required for inspection to the Purchaser's Inspector.

In no case shall any action of Purchaser or his inspector relieve the Manufacturer of his responsibility for material, design, quality or operation of actuators.

7.0 <u>NAME PLATE</u>

Actuator shall have a SS name plate attached firmly to it at a visible place and reporting the following information :

- a) Instrument tag number as per Purchaser's data sheets.
- b) Manufacturer's model, trade mark, serial no etc.
- c) Max. allowable operating pressure or voltage.
- d) Area classification in which the equipment can be used.
- e) Actuator characteristics data.
- f) Inspection agency name or logo.

8.0 <u>SHIPPING</u>

- 8.1 All threaded and flanged opening shall be suitably protected to prevent entry of foreign material.
- 8.2 The actuator shall be supplied pre-assembled except piping/ tubing, actuator, actuator control unit, tanks and other accessories shall be packed separately.
- 8.3 Protective grease oil coating shall be applied on the surface to protect them from rusting.
- 8.4 Package shall be marked legibly with suitable marking ink the following :
 - a) Order number
 - b) Package number
 - c) Manufacturer's name
 - d) Model no. & Thrust
 - e) Tag number
 - f) Inspection agency name or logo

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9.0 DOCUMENTATION

- 9.1 At the time of vendor drawing approval the manufacturer shall submit the following documents in accordance with EN102043.1C.
 - a) A detailed specification sheet for valve actuator providing all the details regarding type, materials of construction for various parts etc.
 - b) Schematic diagrams showing the complete actuator control circuit.
 - c) A detailed dimensional drawing.
 - d) Installation drawing complete with valve assembly.
 - e) Actuator sizing calculations including relation between required torque of valve and actuator output torque.
 - f) Information asked for vide section 3.0 of this specification and actuator sizing as per Actuator Data Sheet.
 - g) Drawing showing connections by Purchaser (piping, electrical etc.)
 - h) Wiring diagram (actuator electrical circuitry) incorporating latching of momentary signals, remote/ local switch, limit switches.
 - i) Junction box terminal block nos. for I/O signals.
 - j) Parts list.
 - k) Recommended spare parts with prices.
 - 1) Assembly details (Valve & Actuator).
 - m) Clause wise list of deviations from this specification, if any.
 - Information regarding the past experience on similar actuators including (a) Size
 (b) Numbers (c) Name of Installation (d) Owner (e) Name of Contact Person (f) Date of Installation.
 - o) Technical Catalogue giving detailed Technical Specification. and other information for each type of actuator and its accessories covered in the bid.

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9.2 Within 30 days from the date of Purchase Order manufacturer shall submit copes of the following for Purchaser's review and approval.

- a) Documents and specifications as listed in clause 9.1 of this specification.
- b) Test certificates and certificates from statutory bodies.
- c) Manual for installation, erection instructions, maintenance and operation instructions.
- d) Complete assembly drawing of the ball valve matching with the actuator offered.

The approval of these drawings/ documents will not absolve vendor of the responsibility with respect to correct operation of the actuator. Manufacturer's quotation, catalogues, drawings, operating and maintenance manuals etc. shall be in English language.

10.0 SPARES AND ACCESSORIES

Vendor shall quote for two years operational spares, commissioning spares, and any special tools needed for maintenance work on the actuator and its accessories.

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	DATAS	HEET FOR GAS POWERE	D AC	FUATORS FOR E	BALL VALVES
1.	Actuato	r Manufacturer	:	By vendor	
2.	Specific	cation for Gas Powered Actuator	:	MEC/ TS / 05 / E5 / 0	02A
3.	Actuato	or Type	:	On-Off	
4.	Tag No		:	As per the Table-1	
5.	Line No).	:	As per the Table-1	
6.	Service		:	Natural Gas	
7.	Vendor	to furnish, after sizing the actuator	, the fill	ed in torque table no-2	2
8.	Actuato	or Shut-off Pressure	:	As per the Table-1	
6.	Process	Conditions			
	Power (Gas	:	Natural Gas	
	Gas Ter	mperature	:	As per the Table-1	
	Line Ga	as Pressure	:	As per the Table-1	
	Molecu	lar Weight	:	As per gas compos	sition
	Cp/Cv		:	As per gas compos	sition
	Compre	essibility Factor	:	As per gas compos	sition
10.	Power (main lin	Gas Feed Connection from ne	:	3/4" SW	
11.	Actuato (for ope	or remote operation on and close)	:	Required	
12.	Actuato	or Feed Gas	:	a) Line gas	
				b) N ₂ Bottles	
13.	Valve F	Position Limit Switch	:	Required (SPDT SPDT contact separately)	contact for open and for close position

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14.	Local/ and its	Remote selector switch status contact	:	Required (shall be box as per circuit c	wired up to junction liagram)
15.	Pneuma pilot va actuato its end	atic limit valves and solenoid, lves to shut-off gas supply to r when valve reaches one of positions	:	Required	
16.	Self ret momen in the c	aining system for retaining tary open or close signals ontrol circuit	:	Required	
17.	Electric entries cable)	al conduit connection (cable to junction box for purchaser's	:	1" NPT	
18.	Operati a) b)	ng voltage for Solenoid Valves Relays	:	24V D.C. ± 10%	
19.	Contact a) b)	t rating for Limit Switches L/R Switch (Status)	:	2A at 24V D.C.	
20.	Pad loc	k with L/R Switch	:	Required	
21.	Enclosu	ire for			
	a) b)	Actuator Electrical items like solenoid valves, junction boxes, relays, cable glands	:	Certified weatherp Certified weatherp Explosion proof ce Div. 2 Gr. C & D	proof toIP55 & proof toIP55 & prtified for Class 1 T3
22.	Area C	lassification	:	NEC (Class 1,Div	. 2,Gr. C & D,T3)/equiv
23.	Materia valves,	al of construction for all tubing, piping and fittings etc.	:	SS 316	
24.	Make &	k Model No. of Actuator	:	By vendor	
25. 26. 27.	Access Manual Time re Closing	ories Required // Hydraulic Override equired for full opening/ g of the ball valve	: :	Required as per Sp Required as per Sp 2–3 sec. per inch.	pecification pecification Nominal valve port Dia.

	STANDARD TECHNICAL		
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	SPECIFICATION FOR	DOCUMENT NO.	Page 14 of 15
TITLE	GAS POWERED VALVE ACTUATORS	MEC/ TS / 05 / E5 / 002A	REVISION : 0
			EDITION : 1

TABLE-1

ITEM : GAS POWERED BALL VALVE ACTUATORS

S.	Size	Class	Type of	Line	Gas To	emp (°C)	Line (Pressu (kg/cm	Bas ire i ² g)	Delta P Shut Off	Remark
110.			Valve	110.	Inlet	Max	Nor.	Ma x	(kg/cm ² g)	8

MECON LIMITED	STANDARD TECHNICAL		
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TABLE-2

ITEM : GAS POWERED BALL VALVE ACTUATORS

	MR Item	Data from Ball Valve Vendor for (@ Max. Diff. Press.)			Ball Valv Figure wit Factor	e Torque th a safety of 1.25	Actuator Torque : pressure	Model Selected	
Sl. No.	No., Valve Size & rating, Qty.	Break Torque (Nm)	Running Torque (Nm)	Max Allowable Valve Stem Torque (Nm)	Break Torque (Nm)	Running Torque (Nm)	Break Torque (Nm)	Running Torque (Nm)	

NOTE :

- 1. THESE FIGURES SHALL BE USED AS BASIS FOR TESTING THE ACTUATOR PERFORMANCE DURING FACTORY TESTING. THE ACTUATOR ACCEPTANCE WOULD BE CARRIED OUT AFTER VERIFYING SUCCESSFUL TESTING COMPLETE BALL VALVE WITH ACTUATOR ASSEMBLY.
- 2. ALL TORQUE FIGURES MUST BE IN Nm.
- 3. Opening / Closing time shall be achieved at max. Design Differential pressure across the valve & actuator regulated pressure max. 24 kg/cm2(g) (approx.). However, the actuator shall open/close the valve at actuator regulated pressure of 10 kg/cm2(g) at max. Design Differential pressure and without timing restriction.



		5		4			3			2							
G	VEN F	IDOR TC PROVIDE	DEVELO	P ACTUA N BOX I	TOR EL HOUSIN	ECTRIC G TER	CAL/HY MINAL	DRAUI BLOCI	LIC CIRC	CUIT AS	S PE DMEF	ER SK R CAE	ETCH	I BELO	AN WC	D	G
F 	SKETCH-2	ACTUATOR ELECTRICAL/HYDRAULIC CIRCUIT TO BE DEVELOPED BY ACTUATOR/ BALL VALVE SUPPLIER WHICH	SHALL INCLUDE RELAYS. LIMIT SWITCHES, SOLENOID VALVES, LOCAL/REMOTE SWITCH, HYDRAULIC SHOCK ABSORBER WITH PUMP UNIT CONTROL AND MANUAL OPERATOR ETC.	ALL CABRING THROUGH GLANDS BY SUPPLIER					POWER JL JL R/L VALVE VALVE VALVE SUPPLY OPEN CLOSED SWITCH CLOSED OPEN COMMAND COMMAND STATUS STATUS STATUS		N COMMAND : POSITIVE PULSE(POTENTIAL FREE) FOR 1 SEC.	SED COMMAND :	DIII SE (DOTENTIAL EREE) FOR 1 SEC FOR FSD VALVES	SE POSITIVE PULSE FOR OTHER VALVES		-	F E D
В	· SULTATE TOTATION	1. CONTACT TO CLOSE ON VALVE OPEN FOR OPEN	LIMIL SWILCH. 2. CONTACT TO CLOSE ON VALVE CLOSE FOR CLOSE LIMIT SWITCH.	 L/R SWITCH CONTACT TO CLOSE WHEN VALVE IS ON REMOTE. 				MULTICORE CABLE	ENTRY (1" NPT)		VALVE OPI	VALVE CLO		II OTHERW		- - -	В
Α	REV NO THIS DRAW SECTION DSGN. DRWN CHKD. VERIFIEI APPROVE	DATE ZONE ING IS PROPERTY ELLEC NAME ACC D D 5	OF MECON AND IS CT. (INST.) V DELHI SIG. DATE	DESCRIPTIONS REVISIONS ISSUED FOR THE SECTIONS PO 4	SPECIFIC PROJECT SPECIFICA INSTR WERED VA	BY TION FC UMENT ALVE AC	APPRD THEREIN. THI DR GAS/ AIR TUATOR: 3	S IS NOT TO	REFEREN BE COPIED OR L SCALE : N. DRG.NO. ME	ICES JSED FOR OTH .T.S IC/05/26/ 2	HER PRO. N	iects unles मै 1EC	ss EXPRESS कॉन ON	sly permitti लिमि LIM	DRG. NO. ED BY MECON. CS IITEI) REV 0	A

PHILOSOPHY FOR AUTO-CLOSURE OF VALVES

The valve shall be designed with Auto closure facility in case of pressure drops below specified value in order to prevent gas leakage due to damage in pipeline.

Three nos. Pressure switches shall be provided and the valve shall close in event of pressure drop indication by 2 out of 3 Pressure Switch.

On auto-closure, valve needs to be opened manually at site.

The set point of pressure for auto-closure shall be communicated during detailed engineering. However, it shall be field adjustable.

Facility for bypassing the auto closure (through manual valve) at site shall be provided. In that case, valve shall operate as a normal on-off remote operated valve.

The range of pressure switch shall be communicated during detailed engineering. However, it may cover entire pipeline operating pressure range.

Note : The above philosophy is applicable to valve actuators having auto closure facility and as indicated against respective MR item nos.

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	& HANDLING OF VALVES		EDITION : 1

STANDARD TECHNICAL SPECIFICATION

FOR

PACKING, TRANSPORTATION AND HANDLING OF VALVES

SPECIFICATION NO .: MEC/TS/05/21/061



(OIL & GAS SBU) MECON LIMITED DELHI 110 092

PREPARED BY:	CHECKED BY:	APPROVED BY:	ISSUE DATE :
(ASHISH MATHUR) SDE	Hawd (HARSH KUMAR) MGR	(A. K. GUPTA) DGM	11.09.2018

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AMENDMENT STATUS

SI.	Clause / Paragraph /	Page	-	Data	BY	Verified		
No.	Drawing Amended	No.	Rev.	Date	Name	Sig.	Name	Sig.
							5	

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1.0 SCOPE

This specification covers the minimum requirements for Packing, Handling & transportation of valves and actuators. Though this specification covers the minimum requirement for packing, handling and transportation of valves, it is to be noted that any defect/ damage arising out of improper packing, handling & transportation shall be the responsibility of vendor. The delay due to rectification of such faults shall be to vendor's account. The date of delivery of material at site shall be considered as the day on which last such rectified material is delivered/ rectified at designated store.

2.0 PACKING

2.1 All valves shall be completely drained of test fluid and thoroughly dried after hydrotesting. The machined surfaces shall be coated with a light film of high viscosity rust inhibiting oil which will not become fluid and run off at temperatures below 80°C.

2.2 Flanged valves NPS 6" and smaller in Class 150 and Class 300 shall be fitted with UV resistant plastic covers. For other sizes, valve end flanges shall be fitted with plywood covers. The cover diameter shall be the same as the outside diameter of the flange and shall be at least 10 mm thick for valves up to NPS 24" and 12 mm thick for valves NPS 26" and larger. The cover shall be attached by machine bolts with a nut and washer fitted on the inside of the flange. There shall be minimum four (4) bolts on valves up to NPS 24" nominal size and eight (8) bolts on valves NPS 26 inch and larger. The bolts diameter shall not be less than 1/4 the size of the flange bolt hole.

2.3 In addition to the above, all flange facings (ring joint, raised and flat) shall be covered with NBR (based) rubber Self-Adhesive protection (see fig below) that meets the following:

Oil, ozone and weather resistant

□ ■ Minimum thickness of 1.5 mm

□ Withstand temperatures up to 75°C

□ Non deforming, loosening or detaching

□ Proof against sand blasting

□ □ No glue residue

Chloride free

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- 2.4 Buttweld end valves shall be blanked on each end by high impact plastic bevel protectors, so that bevels are protected from possible mechanical damage during transportation.
- 2.5 The ends of threaded and socket weld end valves shall be protected with tight fitting plastic caps.
- 2.6 Packing shall be strong and sturdy such that it can withstand loading/unloading, pushing and crane lifting etc. All packaging shall be done in such a manner as to reduce volume and weight as much as possible without jeopardizing the safety of the material. All packing materials shall be new.
- 2.7 Stacking of multiple valves in single box is permitted upto 4" NB. However, in such case suitable partitions are to be made inside packing box.
- 2.8 Where height limitations restrict transportation of valve with actuator in assembled condition, actuator should be dismantled after successful testing at shop. However, the same need to be proposed by valve manufacturer during inspection of said valves and take the approval for Client/ PMC.
- 2.9 When valve, extended stem and actuators are transported in dismantled condition, the same shall be reassembled after fitment of valve at site. Valve vendor to deploy their representative within 3 days once the intimation is sent from site. Any delay beyond 3 days shall be to supplier's account.
- 2.10 Valve manufacturers to note that the safe transportation of assembled valve with actuator is in their scope of work. It is therefore required that the valve manufacturer should order actuator meeting the packing guidelines given in this specification. No claim shall be entertained on account of actuator manufacturer's non compliance of requirements specified in this specification, and the valve with actuator shall leave manufacturer's workshop after meeting the terms given in this specification.
- 2.11 Valves shall not be packed in poly wrap irrespective of the increase in shipping/ transport volume. Box of wood/ ply board etc. shall only be used to pack the valves with/ without actuator irrespective of the size/ rating of the valve.
- 2.12 The packing shall have suitable lifting arrangement to enable the lifting of valve with the packing. Suitable provisions/ supports shall be provided from support foot/ lifting lugs to enable to lift the valve with packing.

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- 2.13 Where it is required to transport valve and actuator separately, above clauses shall be individually applicable for valve and actuator.
- 2.14 Assembled Valves shall be properly secured inside packing in order to avoid any contact with packing material during transport.
- 2.15 For extended stem valves, it is permissible to dismantle stem extension and actuator and as such the valve may be transported in three parts, each part complying individually the requirements of this specification.
- 2.16 Actuators shall be packed in wooden box with proper cushioning of damage prone parts like sockets, tubing, panel boxes etc.
- 2.17 Actuator cylinders shall be mounted on base with the help of metallic U-clamps/ welding on reinforcement plate. Metallic U-clamps to be used with double bolts on either side of U clamp.
- 2.18 Actuator components layout shall be such that to minimize packing volume. Back-up tank shall be put in horizontal position only, wherever feasible.
- 2.19 The manufacturer shall exhibit the packing meeting to the requirement of this specification during inspection and take clearance.

3.0 HANDLING

- 3.1 Manufacturer to ensure that during lifting hooks for assembly are attached to body/ end piece casting/ forging only and not on the pup piece. Any pup piece having hook attachment mark may be rejected.
- 3.2 Assmebled valves, at all times, shall be lifted through lifting lugs only and not from the pup pieces.
- 3.3 Support foot shall be provided on body only in bolted design. In no case, the support foot shall be fastened in body bolting.
- 3.4 Lifting Lugs shall be provided on body/ tail piece in bolted design. In no case, the lifting lugs shall be fastened in body bolting.
- 3.5 Valve vendor to work in close coordination with actuator vendor to ensure that the sling put in lifting lug of valve do not interfere with the actuator/ tubing during lifting at site. Any breakage during site lifting due to fouling of tubing/

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actuator components during site lifting shall be in supplier' account.

3.6 Extended Stem valves shall have placement of lifting lugs to ensure the lifting of valve in stem vertical condition only. Under no condition the valve is to be lifted in Stem horizontal/ inclined position.

4.0 TRANSPORTATION

- 4.1 If the valve and actuator in assembled condition can be accommodated on low bed trailer, low bed trailer shall only be used for inland transportation. Dismantling of valve and actuator shall not be permitted under such case.
- 4.2 Valve shall be secured on trailer/ truck bed with ropes suitably attached with valve boxes. Type of rope selection shall depend upon weight of valve.
- 4.3 Tack welds on trailer/ truck bed shall not be used as a fastening method.
- 4.4 Bolting may be used to securely fasten the valve base on trailer if the provision is available. No. and diameter of bolts shall be suitably chosen as per weight of valve to ensure that bolts do not shear off during transportation.
- 4.5 For large size valves, Loading shall be done preferably by hanging the valve in position and moving the vehicle to valve sitting position.
- 4.6 Since unloading of valves is under valve manufacturer's scope, it is to be ensured that valve manufacturer's representative shall be available at designated store to facilitate the same. Valve manufacturer has to keep the track of vehicle movement accordingly. If due to project exigency/ time constraint the unloading has to be done during manufacturer's representative's absence, any damage during such unloading shall be attributable to manufacturer only.
| | | | | DATA SHEET FOR BA | LL VALVES | | | |
|--------------|--------------------------------|---|--|---|---------------------------------------|--------------------|--|----------|
| | MR Item no. : | 1 | | | | | | |
| 1.0 | Valve Manufa | cturer : | | | | | | |
| 2.0 | Valve Size (NI | B) (inch) | : 600 (24") | ANSI R | ATING : 600# | | Design Standard : API 6D | |
| 3.0 | MECON's Tec | chnical Speci | fication No.: MEC/TS/05/2 | 21/002, Rev-1, Ed-1 | | | | |
| 4.0 | Design Pressu | ure | : 92 kg/cm2 (g) | | | | Design Temperature, °C : -29°C to - | + 65°C |
| | | | | DN 000 (0.00) | | | | |
| 5.0 | Connecting Pi | ipe Specificat | tion: | DN 600 (24") | | | | |
| 5.1 | Material | | | API 5L Gr. X-70, PSL 2 | | | | |
| 5.2 | Diameter (OD) |) | | 610mm | | | | |
| 5.3 | Thickness | | | 12.7mm | | | | |
| 6.0 | Valve Constr | uction Desig | gn | | | | | |
| 6.1.
6.2 | Configuration | one | : Reduced Bore | | Full Bore
Butt Welded as ne | r ASME B16 25 | | |
| 6.3. | Flanges (wher | rever applical | ble) : a) RF | | RT | I AOME DI0.20 | | |
| | • • | | b) Serrated | Smooth (12 | 5 to 200 microinch | ies AARH) | NA V | |
| 6.4 | Ball Mounting | | : Trunnion mour | ted | | | | |
| 6.5 | Valve body typ | pe | : Fully Welded | | | | | |
| 6.6 | 500 mm pup p
(Material,Oute | biece (integra
er Diameter a
al Specificati | lly welded to the valve on
nd Thickness of pup piece
ion | each side) :
a to be same as that of the | Yes V
connecting pipe n | Nonentioned above | 2) | |
| 1.0 | | | | | | Material Of | ered (Equivalent or | |
| | Part | | S | pecified Material | | | superior) | |
| 7.1 | Body | A 2 | 16 Gr. WCB | | | | | |
| 7.2 | Ball
Body Soat Dir - | A 2 | 16 Gr.WCB +75 µENP coat | ng | | | | |
| 7.3 | (No Casting) | S AIS | 61 4140 + 75 micron ENP | coating | | | | |
| 7.4 | Seat Seal | As | per Fire Safe Certificate | of valve manufacturer | | | | |
| 7.5
7.6 | Stem (No castin
Stem Seals | ng) AIS | ner Fire Safe Certificate | ating | | | | |
| 7.7 | Trunnion | A 2 | 16 Gr. WCB | | | | | |
| 7.8 | Stud Bolts/ Nuts | s AS | TM A 193 Gr. B7/ A194 (| Gr. 2H | | | | |
| | o · · · · | | | | O | 0 | | |
| 8.0 | Corrosion Allo | wance | : 1.5 mm
VES | | Service : Natural | Gas | | |
| 10.0 | Operator | | AV operated | As per attac | hed technical spe | cifcation of Gas | Powered Actuator | |
| | | | | Gear Opera | ted for 24" | (REMOTE OP | ERATED) | |
| 11.0 | Fire Resistant | Design Requ | uirement | : Type test as per API 6 | FA/607 | | | |
| 12.0 | valve resting | g Requireme | nt | Test Pressure (min.) | Minimum [| Juration | | |
| | | | | kg/cm ² (g) | (minut | es) | | |
| 12.1 | Hydrostatic Te | est | Body | 157 | As per A | PI 6D | | |
| 12.2 | Air Toot | | Sea | 56.7 | As per A | PI 6D | | |
| 12.2 | All Test | | | 5.6 - 7 | | | | |
| 13.0 | Anti-Static Tes | sting Require | ment : As per Standa | rd API 6D (Latest Ed.) | | | | |
| | | | | | | | | |
| 14.0 | Valve Paintin | ig Specificat | tion | A 0.4/0. Ownshiph Otomotor | | | | |
| 14.1
14.2 | Surrace prepa | aration by Sho
aund installation | ort Blasting as per grade :
on-Three coats of corrosi | on resistant naint shall be a | a 515-055 900.
Applied with minimi | im thickness of | 300 micron | |
| 14.2 | (Permissible t | thickness in e | each coat shall be within 8 | 0 to 120 micron). Colour o | f paint shade shall | be RAL-7038, | however any change in colour | |
| | shall be finaliz | ed during dra | awing approval stage. | , | | | | |
| 15.0 | Lock Open Re | equirement : | NA | | | | | |
| | Notes: | nie Value Det | a Sheet shall be read in - | | Technical Specific | | FS/05/21/002 Pov 1 Ed 1 | |
| | 2 Mi | inimum thickr | ness of valve body / adapt | er shall not be less than as | s per ASME B16.3 | 34 + 1.5 mm CA | 10,001211002,110V I,LU. I | |
| | 3 Ins | spection and | Testing shall be as per a | pproved QAP, this Data Sh | neet, MECON's T.S | S., API 6D and | other relevant standards. | |
| | 4 St | ops shall be | provided for positive align | ment of ball with ports and | ensure proper ins | tallation of hand | le. | |
| | 5 Sh | hort pattern v | alves (as per API 6D or o | therwise) are not permitted | . Only long pattern | valves are to b | e supplied. | |
| | o Cr | ber Cl. 3.4 % | 3.6 of TS respectively of | y, body adaptor, end liange
as per relevant material o | ode. | inigs, sterri & Si | uus / nuts shall be conducted | |
| | 7 Cc | ompressed a | sbestos fibre (CAF) shall | not be used for body sealir | ıg / gasket materia | ls. | | |
| | 8 Fo | or welding en | d, the out of roundness (i. | e. difference between max | imum and minimu | n ID at pipe end | d) shall not be more than 0.5% of pipe | OD. |
| | 9 V | alves shall be | e inspected and approved | by Purchaser before desp | atch. | | | |
| | 10 St
11 Bid | dder shall cle | early write valves material | eu as per Ci. 4. 16 of the 13
(equivalent or superior) off | ered by them again | nst each part/m | aterial of valve in the | |
| | sp | ace provided | for. Wherever bidder ag | ees with valves material as | s mentioned above | in MECON's d | ata sheet, bidder shall clearly indicate | AGREED". |
| | 12 Va | alve seat des | ign shall conform to DIB- | design . | | | | |
| | D | 70115 | 55005 | | | 1 | | |
| REV. NO. | DATE | ZONE | DESCRIPTIONS | BY | APPRD | REFERENCES | DRG NO | |
| SECTION | Oil & Gas | | NE VISIONS | | | | 5.10.110. | |
| | PREPARED C | HECKED AP | PROVED | CLIENT : INDRADHANI | ISH GAS GRID | | | |
| NAME | VK | AM | нк | LIMITED | | 100 T | MECON LIMITED | |
| DATE | 27.03.2025 2 | 7.03.2025 27 | .03.2025 | NORTH -EA | ST NATURAL | "O BOOI Campan | | 1 |
| SIGN | | | | PROJECT: GAS PIPEL
PROJECT | INE GRID | SCALE | | DEV |
| NUN | I | | I | DATA SHEET FOR | BALL VALVES | DATA SHEFT NO | .: MEC/23UU/05/28/M/001/DS/BV/01 | 0 |
| | | | | <u>(NB ≥ 2")</u> | | | | - |
| | | | | | | | | = |

<form><form><form><form></form></form></form></form>					[DATA SHEET FOR BA					
<form></form>					=						
<form> Network 2019 (100) 10 (11) 20 (21) ADX 2010</form>	1.0	MR Item no	0.:2 & 10								
	2.0	Valve Size	(NB) (inch)		· 300 (12") & 50 ((2") ANSI F	RATING : 600#		Design Standard · API 6D		
44 Design Frazer 22 by Ct 1 55 Outweidt Place Specification: Image Specification: 56 Design Frazer Image Specification: 57 Design Frazer Image Specification: 58 Design Frazer Image Specification: 59 Design Frazer Image Specification: 50 Design Frazer Image Specification: 50 Design Frazer Image Specification: 50 Design Frazer Image Specification: 51 Design Frazer Image Specification: 52 Design Frazer Image Specification: 53 Statistication: Image Specification: 54 Statistication: Image Specification: 55 Design Frazer No 56 Design Frazer No 57 Design Frazer No 58 Design Frazer No 59 Design Frazer No 50 Transition: Design Frazer 50 Design Frazer No 50 Design Frazer Design Frazer 50 Design Frazer Design Frazer 51 Design Frazer Design Frazer 52 Design Frazer <t< td=""><td>3.0</td><td>MECON's 1</td><td>rechnical S</td><td>pecification I</td><td>No.: MEC/TS/05/2</td><td>2/002, Rev-1, Ed-1</td><td></td><td></td><td></td><td></td></t<>	3.0	MECON's 1	rechnical S	pecification I	No.: MEC/TS/05/2	2/002, Rev-1, Ed-1					
	4.0	Design Pre	ssure	•	: 92 kg/cm2 (g)				Design Temperature, °C : -29°C to +	+ 65°C	
1 Attria 4100 GR B 2 Diverse 3 Diverse 3 Diverse 4 Diverse 5 Diverse 5 Diverse 5 Diverse 6 Diverse 7 Diverse 8 Diverse 9 Diverse Diverse </td <td>5.0</td> <td>Connecting</td> <td>Pipe Spec</td> <td>ification:</td> <td></td> <td>DN 300 (12")</td> <td>DN 50</td> <td>(2")</td> <td>]</td> <td></td>	5.0	Connecting	Pipe Spec	ification:		DN 300 (12")	DN 50	(2")]		
1 Deriver (OD) Deriver (D) Deriver (D) 2 Deriver (D) Deriver (D) Deriver (D) 2 Deriver (D) Deriver (D) Deriver (D) Deriver (D) 2 Deriver (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) 3 Deriver (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) 4 Deriver (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) 4 Deriver (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) 5 Valve Vorter (D) Section (D) Deriver (D) Deriver (D) Deriver (D) 6 Statistical Specification (D) Section (D) Deriver (D) Deriver (D) Deriver (D) 7 Valve Versitical Specification (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) 7 Valve Versitical Specification (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) 7 Deriver (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) Deriver (D) 7	5.1	Material				API 5L Gr. X-52, PSL 2	ASTM A106	GR. B			
3.5 Thickness U.Y.Trim \$80 3.6 Value Construction Design Full larger Ful	5.2	Diameter (0	DD)			323.9 mm	60.3				
Circleon Nuesces Circ	5.3	Thickness				14.27mm	S80				
Conceptions Conceptions Conceptions Conception Conceptin Conceptin Conception Conception Conception	6.0 6.1	Valve Cons	struction D	esign	· Reduced Bore		Full Bore				
Primages (wherever applicable) Primages (w	6.2.	End Conne	ctions		: Flanged as per	ASME B16.5	Butt Welded as pe	r ASME B16.2	5 √		
b) Saried b) Saried Smoth (125 to 200 microinche AAPF) A V	6.3.	Flanges (w	herever app	olicable)	: a) RF		RT		NA		
Bei motioning E. Tuby Verder Solarm pop piece (hierpark) welded to be value on each side): Yes Yes Y	6.4	Dell Meunti			b) Serrated	Smooth (1	25 to 200 microinch	nes AARH)	NA √		
6.8 500 mm pupplece (integrally welded to the value on each side): Yet is in the series of pupplece to be series as that of the connecting pipe merioned above) 7.1 Series of the series of pupplece to be series as that of the connecting pipe merioned above) 7.1 Series of the se	6.5	Valve body	type		: Fully Welded	leu					
6.8 S00 mm pap pased, fullygually welded to be value on each alsol: Y weld No (Motional Quero Damardia and Dama San Mai of the connecting pipe mentioned above) 7.0 Value Material Specification Specified Material Material Oferned (Equivalent or superior) A 216 or WCB * TglHP coaling 7.1 Specified Material Material Oferned (Equivalent or superior) A 216 or WCB * TglHP coaling Sem doc caling A 216 or WCB * TglHP coaling Service : Netword OF Service : Netword OF Tgl State State * 75 micro State Coaling Service : Netword OF Service : Netword OF Service : Netword OF Service : Netword OF Tgl State State Testing Requirement : As per Standard API SD (Latest Ed.) Or All Particle As per API 6D Or Allowabin Mais <td colspan<="" td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td>	<td></td>										
Yuke Material Specification Material Offered Equivalent or superior) 11 Boty A 76 Gr. WCB	6.6	500 mm pu (Material,O	p piece (inte uter Diame	egrally welde ter and Thick	ed to the valve on ness of pup piece	each side) : e to be same as that of th	Yes V le connecting pipe	N mentioned abc	o ve)		
Image: constraint operation of the second operation operation operation of the second operation operation of the second operation ope	7.0	Valvo Moto	rial Snaalf	ication							
Part Specific Material Superior 1 Instrument A 21 G x WB 3 Instrument 2 Bail A 21 G x WB 3 Instrument Instrument 3 Bail A 21 G x WB 3 Instrument Instrument 7 Bail A 21 G x WB 3 Instrument Instrument 7 Bail A 14 G x 75 micron ENP coaling Instrument Instrument 7 Bail A 16 G x WB 3 A 16 G x WB 3 Instrument Instrument 7 Bail Bail Bail A 16 G x WB 3 Instrument Instrument 7 Bail Bail Bail Bail Bail Instrument	7.0		anai opecir		-	added Made 1		Material Of	fered (Equivalent or		
7.1 Body A 216 Gr. WGB * 8 A 716 Gr. WGB * Image: Control of the Control of		Pa	art		Sp	Decified Material			superior)		
12 Initial and a set of an end of a set of a se	7.1	Body		A 216 Gr. W	CB						
7.3 bits Caling Als 444 - F all controls be cosing 7.4 bits cosing bits fills 7.5 bits cosing Als 444 - F all cos and cosing 7.6 bits cosing Als 444 - F all cos and cosing 7.7 bits cosing Als 444 - F all cos and cosing 7.6 bits cosing Als 644 - F all cosing 7.7 bits cosing Als 644 - F all cosing 7.8 bits cosing Als 647 - F all cosing 7.9 bits cosing Als 667 A f als 476 - F all cosing 7.9 bits cosing Astrix A f als 476 - F all cosing 7.9 bits cosing Astrix A f als 476 - F all cosing 7.9 bits cosing Corrosion Allowance : 1.5 arm 7.9 bits cosing Corrosion Allowance : 1.5 arm 7.9 bits cosing Corrosion Allowance : 1.5 arm 7.1 bits cosing Corrosion Allowance : 1.5 arm 7.1 bits cosing Corrosion Allowance : 1.6 cosing 7.1 bits cosing Corrosion Allowance : 1.6 cosing 7.1 bits cosing Corrosion Allowance <td>7.2</td> <td>Ball Body Seat R</td> <td>inas</td> <td>A 216 Gr.WC</td> <td>B +75 µENP coati</td> <td>ng</td> <td></td> <td></td> <td></td> <td></td>	7.2	Ball Body Seat R	inas	A 216 Gr.WC	B +75 µENP coati	ng					
2 Seal Seal As per Prins and Contracts or vave manufacturer 2 Sear, No. cating) As 144 or 7 micro micro and the Proving 2 Sear, Seals As per File Seals Cartificate of valve manufacturer 7 Turnion A 28 or File Seals Cartificate of valve manufacturer 7 Turnion A 28 or File Seals Cartificate of valve manufacturer 8 Sem Seals As per API 63 or RCG 9 Setter decision : Seal Seal 10 Operator : Seal Seal 11 Hydrostatic Test Body 12 Art Testing Requirement : Seal Seal 12 Art Testing Requirement : Seal Seal 13 Anti-Static Testing Requirement : As per API 60 14 Surface preparation by Short Blasting as per grade SA 21/2, Swedish Slandard SIS-056 90. 14.1 Surface preparation by Short Blasting as per grade SA 21/2, Swedish Slandard SIS-056 90. 14.2 For above ground installation during darger shall no topinction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 14.3 Walve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 15. <td>7.3</td> <td>(No Casting)</td> <td></td> <td>AISI 4140 +</td> <td>75 micron ENP</td> <td>coating</td> <td></td> <td></td> <td></td> <td></td>	7.3	(No Casting)		AISI 4140 +	75 micron ENP	coating					
2 Sens Seas As per Fits Safe Certificate of valve manufacturer 1 Immuno A STW A 193 Gr. BY/ A194 Gr. 2H 3 Senvice: Number of the Stafe Certificate of valve manufacturer 3 Corrosion Allowancia :: 1.5 mm 3 Senvice: Number of the Stafe Certificate of valve manufacturer 4 Operator :: Gear operated for 12 and Lever operated for 2* Size 10 Operator :: Gear operated for 12 and Lever operated for 2* Size 11 Fits Requirement : Type tet as per API 6 FA607 12.2 Art Testi Body 11/14 As per API 60 12.2 Art Testi Body 11/14 As per API 60 12.2 Art Testi Body 11/14 As per API 60 13.0 Anti-Static Testing Requirement : Seve 12. Swedink Bandard SIS-055 00. 14.1 Surface progrand in balaliation Three coats of a consolin resident paint shall be paint with infimum thickness of 300 micron 12.2 Int Test Valve Data Sheet shall be read in conjunction with MEONY Teshinal Specification 13.2 For Requirement: Nummer Develop Call Specification 14.3 End Requirement: Nummer Develop Call Specification 15.4	7.4 7.5	Seat Seal Stem (No ca	stina)	AS per Fire	Safe Certificate	of valve manufacturer					
7.7 Trunnice A 216 Gr. W0B 7.8 Burd block Nuts ASTM A 193 Gr. B7/ A194 Gr. 2H 9.0 Corrosion Allowance :1 5 mm Service : Natural Gas 9.0 Stem extension :: AN 9.0 Operator :: Ger operated for 12" and Lever operated for 2" Size 12.1 Hydrostatic Testing Requirement : Type test as per AP1 6 FA607 12.2 Air Test Body (minum Duration (minum Duration) 12.1 Hydrostatic Testing Requirement : Sa per AP1 6 D 12.2 Air Test Body 157 As per AP1 6 D 12.2 Air Test Body 157 As per AP1 6 D 12.2 Air Test Body 157 As per AP1 6 D 12.2 Air Test Social 15.6 - 7 As per AP1 6 D 12.2 Air Test Social 15.0 Call Social	7.6	Stem Seals	3/	As per Fire	Safe Certificate	of valve manufacturer					
7.3 Exact Bots/ Nus. AST MA 19 Gr. 2// AT94 Gr. 2/I 8.0 Corrosion Allowance : 1.5 mm Service: Natural Gas 9.3 Stem dostnion : NA 100 Operator : Carrosion Allowance : 1.5 mm 111 Service: Natural Gas Service: Natural Gas 121 Hydr Resistant Design requirement : Type test as por API 60 122 Air Test Body 157 As por API 60 122 Air Test Body 1157 As por API 60 122 Air Test Body 1157 As por API 60 122 Air Test Body 1157 As por API 60 122 Air Test Body 1157 As por API 60 123 Anti-Static Testing Requirement: : As per Standard API 60 (Latest Ed.) 144 Valve Painting Specification 14.4 As por API 60 145 Suffices reparation by Shot Blashing as per grade 5A 21/2, Swedish Standard SiS-055 900. 14.5 146 For above ground installation-Three coats of corrosion resistant paint shade shall be RAL-7308, never any change in colour shall be finalized during drawing approval tage. 15.0 15.0 Lock Open Requirement: NA Natest as per AP	7.7	Trunnion		A 216 Gr. W							
8.0 Corrosion Allowance :: 15 mm Service : Natural Gas 9.0 Stem extension :: 0A 9.0 Depration :: 0 care operated for 12° and Lever operated for 2° Size 9.1 Fire Resistant Design Requirement :: Type test as per API 6 FA807 12 Valve Statig Care testing Requirement :: Type test as per API 6 FD 12.1 Hydrostatic Test Boday 157 As per API 6 D 12.2 Art Extlet Testing Requirement: : As per Standard API 6D (Latest Ed.) 13.0 Anti-Static Testing Requirement: : As per Standard API 6D (Latest Ed.) 14.1 Surface reperation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permistibe thickness in each coat shall be tread in conjunction with MEO/N* Technical Specification No. MEC/TS/05/21/002, Rev 1. Ed. 1 13.1 Minimum thickness of valve body / adopter shall not be less than as per ASNE B16.34 + 1.5 mm CA 14.1 Surface as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 15.1 Minimum thickness of valve body / adopter shall not be less than as per ASNE B16.34 + 1.5 mm CA 16.2 E	7.8	Stud Bolts/ N	luts	ASTM A 19	3 Gr. B7/ A194 G	r. 2H					
9.0 Stem extension : NA 10 Opera/r : Gear operated for 12° and Lever operated for 2° size 110 Fire Resistant Design Requirement : Type test as per API 6 FA/607 120 Valve Testing Requirement : Type test as per API 6 FA/607 121 Hydrostatic Test Body 157 As per API 6 D 122 Ari Test 58-7 As per API 6 D 123 Anti-Static Testing Requirement: : As per Standard API 6D (Latest Ed.) 130 Anti-Static Testing Requirement: : As per Standard API 6D (Latest Ed.) 14.1 Store operation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three coals of corroion resistation paint shale shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 150 Lock Open Requirement: NA Notice: Notice: Notice: Notice: Notice: Notice: Notice: Notice: Notice: Noticolspan="2">Notice: <td co<="" td=""><td>8.0</td><td>Corrosion A</td><td>Allowance</td><td></td><td>: 1.5 mm</td><td></td><td>Service : Natural</td><td>Gas</td><td></td><td></td></td>	<td>8.0</td> <td>Corrosion A</td> <td>Allowance</td> <td></td> <td>: 1.5 mm</td> <td></td> <td>Service : Natural</td> <td>Gas</td> <td></td> <td></td>	8.0	Corrosion A	Allowance		: 1.5 mm		Service : Natural	Gas		
10.0 Operator : Gear operated for 12" and Lever operated for 2" Size 10. Fire Resistant Design Requirement : Type test as por API 6 FA607 12.0 Valve Testing Requirement : Type test as por API 6 FA607 12.1 Hydrostatic Test Body 157 As per API 6 D 12.2 Air Test Body 157 As per API 6 D 12.2 Air Test Body 157 As per API 6 D 12.1 Hydrostatic Test Body 157 As per API 6 D 12.2 Air Test Scient Castatic Testing Requirement : As per Standard API 6 D (Latest Ed.) 13.0 Valve Painting Specification 114 As per API 6 D 14.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 142 14.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 142 15.0 Lock Open Requirement : NA Nationary State	9.0	Stem exten	sion		: NA						
110 Test Pressure (min.). Iminutes) 120 Wave Setting Requirement Test Pressure (min.). Minimum Duration 121 Hydrostatic Test Body 157 As per API 60 122 Air Test Seat 114 As per API 60 122 Air Test Seat 5.6 - 7 As per API 60 123 Anti-Static Testing Requirement : As per Standard API 60 (Latest Ed.) 13.0 Anti-Static Testing Requirement : As per Standard API 60 (Latest Ed.) 14.1 Surface preparation by Short Biasing as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three coats of corresion resistant paint shall be applied with minimum thickness of 300 micron (Perrissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7036, however any change in colour shall be finalized within drawing approval stage. 15.0 Lock Open Requirement : NA Notizes Minimum thickness of value body / adapter shall not be less than as per ASNE B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved OAP, this Data Sheet, MECON's T.S. API 60 and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure projet installation of handle. </td <td>10.0</td> <td>Operator</td> <td>ont Design</td> <td>Poquiromont</td> <td>: Gear operated t</td> <td>for 12" and Lever operate</td> <td>ed for 2" Size</td> <td></td> <td></td> <td></td>	10.0	Operator	ont Design	Poquiromont	: Gear operated t	for 12" and Lever operate	ed for 2" Size				
Image: Test Pressure (min.), Minimum Duration (gen? (g) Minimum Duration (gen? (g) 12.1 Hydrostatic Test Body 157 As per API 6D 12.2 Air Test 5.6 - 7 As per API 6D 12.1 Hydrostatic Testing Requirement: : As per Standard API 6D (Latest Ed.) 13.0 Anti-Static Testing Requirement: : As per Standard API 6D (Latest Ed.) 14.1 Surface proparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three coats of corrosion residant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be writin 80 to 120 micron). Colour of paint shade shall be RAL-7036, however any change in colour shall be finalized during drawing approval stage. 15.0 Lock Open Requirement: : NA Notes: 1 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002,Rev 1, Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME B163 4+ 1.5 mm CA 3 Inspection and Testing shall be zonducted 4 Stops shall be provided for positive alignment of ball with poins and ensure proper installation of handle. 5 Chargy V-nota & Hardness tel for body, loadapter, end lindings, shall hog zea ari	12.0	Valve Test	ing Requir	ement							
12.1 Hydrostatic Test Body 137 As per API 60 12.2 Art Test 5.6.7 As per API 60 12.2 Art Test 5.6.7 As per API 60 13.0 Anti-Static Testing Requirement : As per Standard API 6D (Latest Ed.) 14.1 Surface preparation by Short Biasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three costs of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each cost shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 15.0 Lock Open Requirement : NA Natest 1 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 2 Minimum thickness of valve PAI PG D or therewise) are not permitted. Only long pattern valves are be supplied. 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per relevant thandraid code. 6 Charpy V-notch & Hardness test for						Test Pressure (min.),	Minimum D	uration			
Note Seat 114 As per API 60 12.2 Air Test 6.6 - 7 As per API 60 13.0 Anti-Static Testing Requirement : As per Standard API 6D (Latest Ed.) 14.1 Surface preparation by Short Blassing as per grade SA 2 1/2, Swedish Standard SIS-055 800. 14.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 15.0 Lock Open Requirement : NA Notes: 1 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved OAP, this Data Sheet, MECON's Technical Specification of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permittedOnly long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seating flasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.	12.1	Hvdrostatic	Test		Body	кg/cm (g) 157	(minute As per A	es) PI 6D			
12.2 Air Test 5.6 - 7 As per API 6D 13.0 Anti-Static Testing Requirement: : As per Standard API 6D (Latest Ed.) 14.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three costs of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each cost shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 15.0 Lock Open Requirement: NA Notes: 1 1 This Valve Data Sheet shall be read in conjunction with MECON'S TS. API 6D and other relevant standards. 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON'S TS. API 6D and other relevant standards. 3 Stops shall be provided for positiva alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per Cl. 34 4 3.6 of Ts respectively or as per relevant material code. 7 Compressed abstos fibre (CAF) shall not be used for body sealing / gasket materials. 8 top shall be infining lugs shall be provided for roundness (i.c. difference between maximum and mi					Seat	114	As per A	PI 6D			
13.0 Anti-Static Testing Requirement: As per Standard API 6D (Latest Ed.) 14.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three coals of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coal shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 15.1 Lock Open Requirement: NA Notes: 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002,Rev 1, Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME_B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's TS, API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with nots and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per C1. 43 & 3 of TS respectively or a per relevant thaterial code. 7 Compressed abbestos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welfing lodery stri	12.2	Air Test				5.6 - 7	As per A	PI 6D			
14.0 Valve Painting Specification 14.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coats shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 10.10 Lock Open Requirement: NA Notes: 1 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per CI. 3.4 & 3.8 of TS respectively or as per relevant material code. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.	13.0	Anti-Static	Testing Red	quirement	: As per Standa	rd API 6D (Latest Ed.)					
14.1 Survive Painting Spectration by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 900. 14.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 15.0 Lock Open Requirement : NA Notes: 1 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME D616.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-noth & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per Cl. 3.4 & 3.6 of TS respectively or as per relevant material code. 7 Compresed asbeetos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purch	14.0	Value Dain	ting Casait	lastian							
14.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 15.0 Lock Open Requirement : NA Notes: 1 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON'S T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notak & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per C1.3 4 & 8.3 6 for Strespectively or as per relevant material code. 7 Compressed asbestos fibre (CAF) shall not be used for body sealling / gaket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves seat design shall be provided as per C1. 4 16 of the TS for Ball Valves.	14.0	Surface pre	ting Specific eparation by	Short Blasti	ng as per grade S	SA 2 1/2. Swedish Standa	ard SIS-055 900.				
(Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage. 15.0 Lock Open Requirement : NA Notes: 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002, Rev 1, Ed. 1 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per Cl. 34 & 3.6 of TS respectively or as per relevant material code. 7 Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected an approved by Purchaser before despatch. 10 Support toot & lifting lugs shall be provided as per Cl. 4.16 of the TS for Ball Valves. 11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indica	14.2	For above o	ground insta	allation-Thre	e coats of corrosi	on resistant paint shall b	e applied with minir	num thickness	of 300 micron		
Shall be innalized outling drawing approval stage. 15.0 Lock Open Requirement : NA Notes: 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002,Rev 1,Ed. 1 Minimum thickness of valve body / adapter shall not be less than as per ASME B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per C1. 3.4 & 3.6 of TS respectively or as per relevant material code. 7 7 Compressed asbeetso fibre (CAF) shall not be used for body sealing / gaket materials. 8 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 10 Support foot & lifting lugs shall be provided as per C1. 4.1 6 of the TS for Ball Valves. 11 11 Bidder shall clearly write valves material (equivalent or superior) offf		(Permissib	le thickness	s in each coa	t shall be within 8	80 to 120 micron). Colour	of paint shade sha	II be RAL-703	8, however any change in colour		
Notes: 1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002,Rev 1 ,Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notot & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per CI. 3.4 & 3.6 of TS respectively or as per relevant material code. 7 Compressed absetsof fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per CI. 4.16 of the TS for Ball Valves. 11 Bidder shall colarly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. 12 Valve seat design shall conform to DIB-1 design . REEV.NO. DATE <td>15.0</td> <td>Lock Open</td> <td>Requireme</td> <td>nt: NA</td> <td>proval stage.</td> <td></td> <td></td> <td></td> <td></td> <td></td>	15.0	Lock Open	Requireme	nt: NA	proval stage.						
1 This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002,Rev 1, Ed. 1 2 Minimum thickness of valve body / adapter shall not be less than as per ASME B16.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per C1. 34 & 8.3 6 of TS respectively or as per relevant material code. 7 Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per C1. 4.16 of the TS for Ball Valves. 11 Bidder shall colarity write valves material equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat		Notes:									
2 Minimum muckness or vaive body / adapter shall not be less than as per ASME B10.34 + 1.5 mm CA 3 Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards. 4 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. 5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per Cl. 34 & 3.6 of TS respectively or as per relevant material code. 7 Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per Cl. 4.16 of the TS for Ball Valves. 11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design . REVISIONS SECTION OII & Gas		1	This Valve	Data Sheet	shall be read in co	onjunction with MECON's	Technical Specific	ation No. MEC	C/TS/05/21/002,Rev 1 ,Ed. 1		
 Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle. Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per Cl. 3.4 & 3.6 of TS respectively or as per relevant material code. Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials. For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. Valves shall be inspected and approved by Purchaser before despatch. Support foot & lifting lugs shall be provided as per Cl. 4.16 of the TS for Ball Valves. Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". Valve seat design shall conform to DIB-1 design. Rev. No. DATE ZONE DESCRIPTIONS BY APPRD REV. NO. DATE ZONE REFERENCES DRG. NO. SECTION Oil & Gas REV. NO. DATE Z1.03.2025 Z7.03.2025 Z7.03.2025<		∠ 3	Inspection	and Testing	aive bouy / adapt shall be as per ar	er snall not be less than oproved QAP, this Data s	as per ASME B16. Sheet, MECON's T	34 + 1.5 mm C S., API 6D and	n I other relevant standards.		
5 Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied. 6 Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per CI. 34. & 3.6 of TS respectively or as per relevant material code. 7 Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per CI. 4.16 of the TS for Ball Valves. 11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder argrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design. REVISIONS REVISI		4	Stops shall	be provided	for positive align	ment of ball with ports ar	id ensure proper in	stallation of ha	ndle.		
o Charpy v-notice & Harpiness test for body, body adaptor, end hanges, ball, body seat rings, stem & studs / nuts shall be conducted as per Cl. 3.4 & 3.6 of TS respectively or as per relevant material code. 7 Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per Cl. 4.16 of the TS for Ball Valves. 11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design . REVISIONS SECTION Oil & Gas 1 PREPARED 0 AMME VKS AM NAME VKS VKS AM NORTH -EAST NATURAL PROJECT Scale :		5	Short patte	rn valves (as	per API 6D or ot	herwise) are not permitte	d. Only long patter	n valves are to	be supplied.		
7 Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials. 8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per Cl. 4.16 of the TS for Ball Valves. 11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design . REVISIONS SECTION Oil & Gas E PREPARED NAME VKS AM HK DATE 27.03.2025 SIGN CLIENT : INDRADHANUSH GAS GRID PROJECT SIGN Improved by Prepared SIGN Improved by Prepared DATA SHEET FOR BALL VALVES DATA SHEET NO: MEC/23UU/05/28/M001/DS/28/M001/DS/28//02 0 (MB ≥ 2") Data SHECT NO: MEC/23UU/05/28/M001/DS/28//02		6	as per CI	10100 & Hard 3.4 & 3.6 of T	S respectively or	as per relevant material	Jes, bail, body seal code.	nings, stem &	SILIUS / NUTS SHAIL DE CONDUCTED		
8 For welding end, the out of roundness (i.e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD. 9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per Cl. 4.16 of the TS for Ball Valves. 11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design . REV.NO. DATE CONE REVISIONS SECTION OII & Gas CLIENT : INDRADHANUSH GAS GRID LIMITED NAME VKS AM VAR AM SIGN VI NORTH -EAST NATURAL PROJECT: SIGN VI SCALE : REV DATA SHEET FOR BALL VALVES NATA SHEET FOR BALL VALVES NATA SHEET FOR BALL VALVES		7	Compresse	ed asbestos f	ibre (CAF) shall r	not be used for body seal	ing / gasket materi	als.			
9 Valves shall be inspected and approved by Purchaser before despatch. 10 Support foot & lifting lugs shall be provided as per Cl. 4.16 of the TS for Ball Valves. 11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design . REV. NO. DATE REVISIONS SECTION OII & Gas PREPARED CHECKED APPROVED CLIENT : INDRADHANUSH GAS GRID LIMITED NORTH -EAST NATURAL PROJECT : GAS PIPELINE GRID MECON LIMITED SCALE : NAME VKS AM HK PATA SHEET FOR BALL VALVES DATA SHEET NO.: MEC/23UU/05/28/M001/DS/8V/02 Q SCALE :		8	For welding	g end, the ou	t of roundness (i.	e. difference between ma	aximum and minimu	m ID at pipe e	nd) shall not be more than 0.5% of pip	be OD.	
11 Bidder shall clearly write valves material (equivalent or superior) offered by them against each part/material of valve in the space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design . REV.NO. DATE ZONE DESCRIPTIONS REVISIONS SECTION OIL & Gas CHECKED APPROVED CLIENT : INDRADHANUSH GAS GRID LIMITED NORTH -EAST NATURAL PREPARED CHECKED APPROVED SIGN AM HK DATE SIGN AM VKS AM HK PROJECT: GAS PROJECT SCALE : MECON LIMITED SCALE : NORTH -EAST NATURAL PROJECT SIGN ATA SHEET FOR BALL VALVES OATA SHEET NO: MEC/23UU/05/28/M001/DS/8V/02 0 (NB ≥ 2") Data SHEET NO: MEC/23UU/05/28/M001/DS/8V/02		9 10	valves sha	all be inspect	ed and approved	by Purchaser before des	spatch. TS for Ball Valves				
space provided for. Wherever bidder agrees with valves material as mentioned above in MECON's data sheet, bidder shall clearly indicate "AGREED". 12 Valve seat design shall conform to DIB-1 design . REV. NO. DATE ZONE DESCRIPTIONS BY APPRD REVISIONS BY APPRD SECTION OII & Gas CLIENT : INDRADHANUSH GAS GRID LIMITED MECON LIMITED MECON LIMITED NAME VKS AM HK NORTH -EAST NATURAL PROJECT: NORTH -EAST NATURAL PROJECT: MECON LIMITED MECON LIMITED Sign Image: Sign Image: Sign Image: Sign DATA SHEET FOR BALL VALVES (NB ≥ 2") DATA SHEET NO: MEC/23UU/05/28/M001/DS/8V/02 74 of 07		11	Bidder sha	Il clearly write	e valves material	(equivalent or superior)	offered by them aga	ainst each part	/material of valve in the		
12 Valve seat design snall conform to DIB-1 design . REV.NO. DATE ZONE DESCRIPTIONS BY APPRD REVISIONS REFERENCES DRG. NO. SECTION Oil & Gas REFERENCES DRG. NO. NAME VKS AM HK CLIENT : INDRADHANUSH GAS GRID LIMITED NAME VKS AM HK NORTH -EAST NATURAL PROJECT: GAS PIPELINE GRID PROJECT: GAS PIPELINE GRID PROJECT MECON LIMITED Scale : REV DATA SHEET FOR BALL VALVES (MB ≥ 2") Data Sheet No.: MEC/23UU/05/28/M001/DS/BV/02 REV			space prov	ided for. Wh	erever bidder agr	ees with valves material	as mentioned abov	e in MECON's	data sheet, bidder shall clearly indica	te "AGREED".	
REV.NO. DATE ZONE DESCRIPTIONS BY APPRD REFERENCES DRG.NO. SECTION Oil & Gas PREPARED CHECKED APPROVED NAME VKS AM HK DATE 27.03.2025 27.03.2025 27.03.2025 SIGN Image: Sign sign sign sign sign sign sign sign s		12	vaive seat	aesign shall	conform to DIB-1	aesign .					
Image: Network in the second secon	REV. NO.	DATE	ZONE		DESCRIPTIONS	BY	APPRD	DEEE			
PREPARED CHECKED APPROVED NAME VKS AM HK DATE 27.03.2025 27.03.2025 27.03.2025 SIGN Image: Sign state sta	SECTION	Oil & Gae			REVISIONS			REFERENCES	DRG. NO.		
NAME VKS AM HK DATE 27.03.2025 27.03.2025 27.03.2025 27.03.2025 27.03.2025 27.03.2025 27.03.2025 PROJECT: GAS PIPELINE GRID PROJECT MECON LIMITED SIGN Image: Construction of the state of the		PREPARED	CHECKED	APPROVED		CLIENT : INDRADHAN	USH GAS GRID				
DATE 27.03.2025 27.03.2025 27.03.2025 27.03.2025 27.03.2025 27.03.2025 27.03.2025 PROJECT: GAS PIPELINE GRID PROJECT Image: Constraint of the project of the	NAME	VKS	AM	нк		LIMITED		मेकॉन ्रे	MECON LIMITED		
SIGN Intelline OND PROJECT SCALE : REN DATA SHEET FOR BALL VALVES (NB ≥ 2") Data SHEET NO.: MEC/23UU/05/28/M001/DS/BV/02 0	DATE	27.03.2025	27.03.2025	27.03.2025			AST NATURAL	Soot Campo			
DATA SHEET FOR BALL VALVES DATA SHEET NO.: MEC/23UU/05/28/M/001/DS/BV/02 0 (NB ≥ 2") Daras 74 of 0.7	SIGN					PROJECT		SCALE :		REV	
(NB≥2") Dordo 74 of 07				•		DATA SHEET FOR	BALL VALVES	DATA SHEET NO	D.: MEC/23UU/05/28/M/001/DS/BV/02	0	
						(NB ≥ 2")			Page	74 of 97	

				<u>I</u>	DATA SHEET FOR BA	LL VALVES			
1.0	MR Item no Valve Manu	b. : 3,7 & 8 ufacturer :							
2.0	Valve Size	(NB) (inch)		: 300 (12"),200 (8	3"),100(4") ANSI R	ATING : 600#		Design Standard : API 6D	
3.0 4.0	MECON's T Design Pre	Гесhnical S ssure	pecification N	No.: MEC/TS/05/2 : 92 kg/cm2 (g)	21/002, Rev-1, Ed-1			Design Temperature, °C : -29°C to	+ 65°C
5.0	Connecting	Pipe Spec	ification:		DN 300 (12")	DN 200	(8")	DN 100 (4")	
5.1	Material	11.90.0000			API 51 Gr X-52 PSI 2	API 5I Gr F	PSI 2	ASTM A106 GR B	
5.1	Diamatar (וחכ			323.0 mm	210.0	7	114.3	
5.2	Thickness)))			14.27mm	14.3m	, m	XS	
6.0	Valve Con	struction D	lesign				· · · · · ·		
6.1. 6.2	Configuration	on ctions		: Reduced Bore : Flanged as per	ASME B16.5	Full Bore Butt Welded as pe	r ASME B16 25	5 1	
6.3.	Flanges (w	herever app	olicable)	: a) RF		RT		NA 🗸	
6.4	Ball Mounti	ng		b) Serrated: Trunnion mount	Smooth (12 ted	25 to 200 microinch	ies AARH)	NA V	
6.5	Valve body	type		: Fully Welded					
6.6	500 mm pu (Material,O	p piece (int uter Diame	egrally welde ter and Thick	ed to the valve on mess of pup piece	each side) : e to be same as that of th	Yes V e connecting pipe	No mentioned abo	o ve)	
7.0	Valve Mate	erial Specif	ication				Material Off	ared (Equivalent or	
	Pa	art		Sp	ecified Material		s s	superior)	
7.1	Body		A 216 Gr. W	СВ					
7.2	Ball Body Seat R	ings	A 216 Gr.WC	B +75 µENP coati	ng				
7.3	(No Casting)	5	AISI 4140 +	Safo Cortificato	of valvo manufacturor				
7.4 7.5	Seat Seal Stem (No ca	sting)	AISI 4140 + 7	5 micron ENP coa	ating				
7.6	Stem Seals		As per Fire	Safe Certificate	of valve manufacturer				
7.7	Trunnion	lute	A 216 Gr. W	CB 3 Gr B7/ A194 G	r 2H				
7.0	Stud Bolts/ 1	NUIS							
8.0	Corrosion A	Allowance		: 1.5 mm		Service : Natural	Gas		
9.0 10.0	Operator	sion		: NA : Gear Operated	for 12" & 8" and Lever or	erated for 4" Size			
11.0	Fire Resist	ant Design	Requirement		: Type test as per API 6	FA/607			
12.0	Valve Test	ing Requir	ement		Test Bressure (min)	Minimum D	uration		
					kg/cm ² (g)	(minute	es)		
12.1	Hydrostatic	Test		Body	157	As per A	PI 6D		
12.2	Air Test			Seat	114 5.6 - 7	As per A As per A	PI 6D PI 6D		
13.0	Anti-Static	Testing Reg	quirement	: As per Standa	rd API 6D (Latest Ed.)				
44.0	Value Bala								
14.0 14.1	Surface pre	paration by	/ Short Blasti	ng as per grade \$	SA 2 1/2, Swedish Standa	rd SIS-055 900.			
14.2	For above	ground insta	allation-Thre	e coats of corrosi	on resistant paint shall be	applied with minir	num thickness	of 300 micron	
	(Permissib	le thicknes: alized durin	s in each coa a drawing ar	t shall be within 8	30 to 120 micron). Colour	of paint shade sha	II be RAL-7038	3, however any change in colour	
15.0	Lock Open	Requireme	nt: NA	protal olago.					
	Notes:	Thic M	Date Of	aball be see 11		Technical C	ation Mr. Area		
	1 2	I I I I I I I I I I I I I I I I I I I	uata Sheet s nickness of v	alve body / adapt	er shall not be less than a	i ecnnical Specific as per ASME B16.	auon No. MEC 34 + 1.5 mm C.	A A A A A A A A A A A A A A A A A A A	
	3	Inspection	and Testing	shall be as per ap	oproved QAP, this Data S	heet, MECON's T.	S., API 6D and	other relevant standards.	
	4	Stops shall	l be provided	for positive align	ment of ball with ports an	d ensure proper in	stallation of ha	ndle.	
	6	Charpy V-r	notch & Hard	ness test for body	, body adaptor, end flang	es, ball, body seat	rings, stem & s	studs / nuts shall be conducted	
	_	as per Cl. 3	3.4 & 3.6 of T	S respectively or	as per relevant material	code.			
	7 8	Compresse For welding	ed asbestos f a end, the ou	tore (CAF) shall r	not be used for body seali e, difference between ma	ng / gasket materia	ais. m ID at pine er	nd) shall not be more than 0.5% of n	pe OD.
	9	Valves sha	all be inspect	ed and approved	by Purchaser before des	patch.		, <u> </u>	
	10	Support for	ot & lifting lug	s shall be provid	ed as per Cl. 4.16 of the	TS for Ball Valves.	inot each and	motorial of volum in the	
	11	space prov	ii clearly writ ided for. Wh	e vaives material erever bidder aar	(equivalent or superior) of ees with valves material a	as mentioned abov	e in MECON's	data sheet, bidder shall clearly indic	ate "AGREED".
	12	Valve seat	design shall	conform to DIB-1	design .				
REV. NO.	DATE	ZONE		DESCRIPTIONS	BY	APPRD	DEFEDENCES		
SECTION	Oil & Gas			REVISIONS			REFERENCES	UKG. NU.	
	PREPARED	CHECKED	APPROVED		CLIENT : INDRADHANU	JSH GAS GRID			
NAME	VKS	AM	НК		LIMITED		मेकॉन	MECON LIMITED	
DAIE	21.03.2025	27.03.2025	21.03.2025		NORTH -EA PROJECT: GAS PIPEL	AST NATURAL	-001 Carr		
SIGN					PROJECT		SCALE :		REV
_		_			DATA SHEET FOR	BALL VALVES	DATA SHEET NO	.: MEC/23UU/05/28/M/001/DS/BV/03	0
					(NB ≥ 2")			Page	75 of 97

					DATA SHEET FOR BAI	L VALVES			
	MR Item n	o.:4&5							
1.0	Valve Man	ufacturer :							
2.0	Valve Size	(NB) (inch)		: 300 (12"), 200 ((8") ANSI R	ATING : 600#		Design Standard : API 6D	
3.0	MECON's	Technical S	pecification N	lo.: MEC/TS/05/2	1/002, Rev-1, Ed-1				
4.0	Design Pre	essure		: 92 kg/cm2 (g)				Design Temperature, °C : -29°C to	o + 65°C
5.0	Connecting	Dino Snoc	ification:		DN 300 (12")	DN 200	(8")	1	
5.0	Connecting	g ripe Spec	incation.						
5.1	Material				API 5L Gr. X-52, PSL 2	API 5L Gr.E	3 PSL 2		
5.2	Diameter (OD)			323.9 mm	219.07	mm		
5.3	Thickness				14.27mm	14.3m	m		
6.0	Configurati	on	lesign	· Reduced Bore		Full Bore			
6.2.	End Conne	ections		: Flanged as per	ASME B16.5	Butt Welded as pe	r ASME B16.2	5 🗸	
6.3.	Flanges (w	herever app	licable)	: a) RF		RT		NA 🗸	
				b) Serrated	Smooth (125	to 200 microinches	s AARH)	NA v	
6.4 6.5	Ball Mounti Valve body	ing v type		: Trunnion mount : Fully Welded	ted				
6.6	500 mm pu (Material,O	ip piece (inte outer Diamet	egrally welde er and Thicki	d to the valve on ness of pup piece	each side) : to be same as that of the o	√ connecting pipe me	N ntioned above)	o	
7.0	Valve Mate	erial Specif	ication				Matorial Of	forod (Equivalant or	
	P	art		S	specified Material		materia U	superior)	
7.1	Body		A 216 Gr. W0	СВ					
7.2	Ball		A 216 Gr.WC	B +75 µENP coati	ng				
7.3	Body Seat R (No Casting)	tings)	AISI 4140 +	75 micron ENP	coating				
7.4	Seat Seal	/	As per Fire	Safe Certificate	of valve manufacturer				
7.5	Stem (No ca	asting)	AISI 4140 + 7	5 micron ENP coa	iting				
7.6	Stem Seals		As per Fire	Safe Certificate	of valve manufacturer				
7.8	Stud Bolts/ N	luts	ASTM A 19	3 Gr. B7/ A194 G	ir. 2H				
8.0	Corrosion A	Allowance		: 1.5 mm		Service : Natural	Gas		
9.0	Stem exter	nsion		: NA	A				
10.0	Operator			: 3 nos valve wi	th auto closure facility	ed technical specifi	Gear operated	for 12" & 8" Size	
11.0	Fire Resist	ant Design I	Requirement	. o noo varve w	: Type test as per API 6 F	A/607	ocur operator		
12.0	Valve Test	ting Requir	ement						
					Test Pressure (min.),	Minimum D	uration		
12.1	Hydrostatic	Tost		Body	kg/cm²(g)	(minute As per A	es) PI 6D		
12.1	Tyurostatio	, 1651		Seat	114	As per A	PI 6D		
12.2	Air Test				5.6 - 7	As per A	PI 6D		
12.0	Anti Statia	Tooting Por	wiromont	· As nor Standa	rd API 6D (Latest Ed.)				
13.0	Anti-Static	Testing Red	quirement	. As per Standa	TU AFT OD (Latest Lu.)				
14.0	Valve Pair	nting Speci	fication						
14.1	Surface pre	eparation by	Short Blastir	ng as per grade S	A 2 1/2, Swedish Standard	SIS-055 909.			
14.2	For above	ground insta	allation-Three	coats of corrosio	n resistant paint shall be ap	plied with minimum	thickness of 3	00 micron	
	(Permissio	alized during	s in each coai a drawing an	t snall be within 8	U to 120 micron). Colour of	paint snade snall be	e RAL-7038, no	owever any change in colour	
15.0	Lock Open	Requireme	nt: NA	provur stuge.					
	Notes:	-							
	1	This Valve	Data Sheet	shall be read in co	onjunction with MECON's T	echnical Specification	on No. MEC/TS	S/05/21/002,Rev 1 ,Ed. 1	
	2	Minimum ti	nickness of va	aive body / adapte	er shall not be less than as	per ASME B16.34	+ 1.5 mm CA	hor relevant standards	
	3 4	Stops shall	l be provided	for positive alignment	ment of ball with ports and e	ensure proper instal	lation of handle	norreievant stanuarus.	
	5	Short patte	rn valves (as	per API 6D or ot	herwise) are not permitted.	Only long pattern v	alves are to be	supplied.	
	6	Charpy V-r	notch & Hardı	ness test for body	v, body adaptor, end flanges	, ball, body seat rin	gs, stem & stu	ds / nuts shall be conducted	
	-	as per Cl. 3	3.4 & 3.6 of T	S respectively or	as per relevant material co	de.			
	/ 8	Compresse For welding	eu aspestos f	t of roundness /i/	iou de used for body sealing	gasket materials.	ID at nine end\	shall not be more than 0.5% of ning	a OD
	9	Valves sh	all be inspect	ed and approved	by Purchaser before despa	tch.	pipo orid)		
	10	Support for	ot & lifting lug	s shall be provide	ed as per Cl. 4.16 of the TS	for Ball Valves.			
	11	Bidder sha	Il clearly write	e valves material (equivalent or superior) offe	red by them agains	t each part/mat	erial of valve in the	
	12	space prov Valve seat	design shall	conform to DIB-1	ees with valves material as design .	mentioned above ir	i wi∈CON's dal	a sneet, bloder shall clearly indicate	AGKEED".
REV. NO.	DATE	ZONE		DESCRIPTIONS	BY	APPRD			
	01 0 -			REVISIONS	I		REFERENCES	DRG. NO.	
SECTION	UII & Gas	OUFOWER							
NAME	VKS	AM	HK		CLIENT : INDRADHANUS	SH GAS GRID	मिकाँन		
DATE	27.03.2025	27.03.2025	27.03.2025	1			an anot Campuni		
					PROJECT: NORTH -EAS	RID PROJECT			
SIGN							SCALE :		REV
						SALL VALVES	DATA SHEET NO).: MEC/23UU/05/28/M/001/DS/BV/04	0
ļ							1		1

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				<u>[</u>	DATA SHEET FOR BA	LL VALVES			
	MR Itom -	n · 6							
1.0	Valve Manu	ufacturer :							
2.0	Valve Size	(NB) (inch)		: 200 (8")	ANSI F	RATING : 600#		Design Standard : API 6D	
3.0	MECON's 1	Fechnical S	pecification I	No.: MEC/TS/05/2	1/002, Rev-1, Ed-1			-	
4.0	Design Pre	ssure		: 92 kg/cm2 (g)				Design Temperature, °C : -29°C to +	- 65°C
5.0	Connecting	Dine Cree	ification		DN 200 (8")				
5.0	Connecting	Pipe Spec	incation:		DN 200 (8)				
5.1	Material				API 5L Gr.B PSL 2				
5.2	Diameter (0	DD)			219.6				
5.3	Thickness	-truction D			14.3mm				
6.0	Configuration	on	lesign	· Reduced Bore		Full Bore			
6.2.	End Conne	ctions		: Flanged as per	ASME B16.5	Butt Welded as pe	r ASME B16.25	5 🗸	
6.3.	Flanges (w	herever app	plicable)	: a) RF		RT		NA	
6.4	Dell Meunti			b) Serrated	Smooth (1)	25 to 200 microincl	ies AARH)	NA V	
6.4 6.5	Valve body	type		: Fully Welded	eu				
	,	-76-							
6.6	500 mm pu	p piece (int	egrally welde	ed to the valve on	each side) :	Yes √	N	•	
	(Material,O	uter Diame	ter and Thick	ness of pup piece	e to be same as that of th	e connecting pipe	mentioned abo	ve)	
7.0	Valve Mate	rial Specif	ication						
		art		•	onified Meteric!		Material Off	ered (Equivalent or	
	F6	11		31	ecilieu Material		5	superior)	
7.1	Body		A 216 Gr. W	СВ					
7.2	Ball Body Seat R	inas	A 216 Gr.WC	B +75 µENP coati	ng				
7.3	(No Casting)		AISI 4140 +	75 micron ENP	coating				
7.4	Seat Seal	cting)	As per Fire	Safe Certificate	of valve manufacturer				
7.6	Stem Seals	sung)	As per Fire	Safe Certificate	of valve manufacturer				
7.7	Trunnion		A 216 Gr. W	СВ					
7.8	Stud Bolts/ N	luts	ASTM A 19	3 Gr. B7/ A194 G	r. 2H				
	Corrocion	llowance		· 15 mm		Service · Natural	Gae		
9.0	Stem exten	sion		: YES			043		
10.0	Operator			: Gear operated t	or 8" Size				
11.0	Fire Resist	ant Design	Requirement	t	: Type test as per API 6	5 FA/607			
12.0	Valve Test	ing Requir	ement		Test Pressure (min.)	Minimum	uration	1	
					ka/cm ² (a)	(minut	uration es)		
12.1	Hydrostatic	Test		Body	157	As per A	PI 6D		
				Seat	114	As per A	PI 6D		
12.2	Air Test				5.6 - 7	As per A	PI 6D		
13.0	Anti-Static	Testing Red	quirement	: As per Standa	d API 6D (Latest Ed.)				
		5			· · · ·				
14.0	Valve Pain	ting Specif	fication						
14.1	Surface pre	eparation by	y Short Blasti	ing as per grade S	SA 2 1/2, Swedish Standa	ard SIS-055 900.		of 200 misson	
14.2	(Permissib	le thicknes	s in each coa	at shall be within 8	0 to 120 micron). Colour	of paint shade sha	II be RAL-7038	3. however any change in colour	
	shall be fina	alized durin	ng drawing ap	oproval stage.	, -			, , , , , , , , , , , , , , , , , , , ,	
15.0	Lock Open	Requireme	ent: NA						
	Notes:	This Volu-	Data Shoot	shall be read in a		Technical Spacifi	ation No. MEC	175/05/21/002 Pay 1 Ed 1	
	2	Minimum th	hickness of v	alve body / adapt	er shall not be less than	as per ASME B16.	34 + 1.5 mm C	A	
	3	Inspection	and Testing	shall be as per ap	proved QAP, this Data S	Sheet, MECON's T.	S., API 6D and	other relevant standards.	
	4	Stops shall	l be provided	for positive align	ment of ball with ports ar	d ensure proper in	stallation of ha	ndle.	
	5	Short patte	ern valves (as	s per API 6D or ot	herwise) are not permitte	d. Only long patter	n valves are to	be supplied.	
	o	as per CL	3.4 & 3 6 of 1	S respectively or	as per relevant material	code. مانا, budy sea code.	nnys, stem &	SIGUS / TIULS STAIL DE CONQUCIEO	
	7	Compresse	ed asbestos i	fibre (CAF) shall r	not be used for body seal	ing / gasket materi	als.		
	8	For welding	g end, the ou	t of roundness (i.	e. difference between ma	iximum and minimu	m ID at pipe er	nd) shall not be more than 0.5% of pip	e OD.
	9	Valves sha	all be inspec	ted and approved	by Purchaser before des	spatch.			
	10 11	Support too Bidder sha	or & litting lug	js snail be provid e valves material	eu as per CI. 4.16 of the (equivalent or superior) (offered by them and	inst each nart/	material of valve in the	
		space prov	/ided for. Wh	erever bidder agr	ees with valves material	as mentioned abov	e in MECON's	data sheet, bidder shall clearly indica	te "AGREED".
	12	Valve seat	design shall	conform to DIB-1	design .				
					1				
REV. NO.	DATE	ZONE		DESCRIPTIONS	BY	APPRD	DECEDENCES	DRC NO	
SECTION	Oil & Gas			REVISIUNS			NEFERENCES	URG. NU.	
	PREPARED	CHECKED	APPROVED		CLIENT : INDRADHANI	JSH GAS GRID			
NAME	VKS	AM	НК		LIMITED		मेकॉन	MECON LIMITED	
DATE	27.03.2025	27.03.2025	27.03.2025		NORTH -E	AST NATURAL	VO SOOT CONPUT		
SIGN:					PROJECT: GAS PIPEL PROJECT	INE GRID	00415		
SIGN			I		DATA SHEFT FOR	BALL VALVES	DATA SHEET NO) : MEC/23UU/05/28/M/001/DS/BV/05	
					(NB ≥ 2")				77 of 07
								l'age	770197

				<u>1</u>	DATA SHEET FOR BA	LL VALVES			
	MR Item no	o.:9							
1.0	Valve Manu	ifacturer :							
2.0	Valve Size	(NB) (inch)		: 100 (4")	ANSI F	ATING : 600#		Design Standard : API 6D	
3.0 4.0	Design Pres	echnical Sj ssure	pecification f	: 92 kg/cm2 (g)	1/002, Rev-1, Ed-1			Design Temperature, °C : -29°C to	+ 65°C
5.0	Connecting	Pipe Speci	ification:						
5.1									
5.2 5.3	Thickness	(טנ							
6.0	Valve Cons	struction D	esign						
6.1.	Configuratio	on		: Reduced Bore		Full Bore			
6.3.	Flanges (wi	nerever app	olicable)	: a) RF		RT	I ASIVIE D 10.23	NA NA	
				b) Serrated	Smooth (12	25 to 200 microincl	nes AARH)	V NA	
6.4 6.5	Ball Mounti Valve body	ng type		: Trunnion mount : Fully Welded	ed	Two/Three Piece I	Bolted	Either	\checkmark
6.6	500 mm pu (Material,O	p piece (inte uter Diamet	egrally welde ter and Thick	ed to the valve on mess of pup piece	each side) : e to be same as that of th	Yes e connecting pipe	N mentioned abo	o V ve)	
7.0	Valve Mate	rial Specif	ication						
	Pa	irt		Sp	ecified Material		Material Of	fered (Equivalent or	
7.1	Bodv		A 216 Gr. W	СВ				superior	
7.2	Ball		A 216 Gr.WC	B +75 µENP coati	ng				
7.3	Body Seat R (No Casting)	ings	AISI 4140 +	75 micron ENP	coating				
7.4	Seat Seal		As per Fire	Safe Certificate	of valve manufacturer				
7.5 7.6	Stem (No ca	sting)	AISI 4140 + 7	75 micron ENP coa	iting of valve manufacturer				
7.0	Trunnion		A 216 Gr. W	CB	or varve manufacturer				
7.8	Stud Bolts/ N	luts	ASTM A 19	3 Gr. B7/ A194 G	r. 2H				
9.0 10.0 11.0 12.0	Stem extensi Operator Fire Resista Valve Test	sion ant Design I i ng Requir e	Requirement ement	: NA : Lever operated	for 4" size : Type test as per API 6 Test Pressure (min.), kg/cm ² (g) 157	FA/607 Minimum D (minut	uration es)		
12.1	Hydrostatic	lest		Body Seat	157	As per A As per A	PI 6D PI 6D		
12.2	Air Test				5.6 - 7	As per A	PI 6D		
13.0	Anti-Static	Testing Rec	quirement	: As per Standar	rd API 6D (Latest Ed.)				
14.0 14.1 14.2 15.0	Valve Pain Surface pre For above of (Permissible shall be fina Lock Open	ting Specif paration by ground insta le thickness alized durin Requireme	fication / Short Blasti allation-Three s in each coa g drawing ap nt : NA	ng as per grade S e coats of corrosi t shall be within 8 pproval stage.	SA 2 1/2, Swedish Standa on resistant paint shall be 80 to 120 micron). Colour	ard SIS-055 900. e applied with minir of paint shade sha	num thickness II be RAL-7038	of 300 micron 3, however any change in colour	
	Notes:		- :						
	1 2	inis Valve Minimum th	Data Sheet : nickness of v	snall be read in co alve bodv / adapt	onjunction with MECON's er shall not be less than a	i echnical Specific as per ASME B16	ation No. MEC 34 + 1.5 mm C	,/15/05/21/002,Rev 1 ,Ed. 1 A	
	3	Inspection	and Testing	shall be as per ap	oproved QAP, this Data S	heet, MECON's T.	S., API 6D and	other relevant standards.	
	4 F	Stops shall	be provided	for positive align	ment of ball with ports an	d ensure proper in	stallation of ha	ndle.	
	5 6	Charpy V-n	notch & Hard	ness test for body	, body adaptor, end flang	les, ball, body sea	rings, stem &	studs / nuts shall be conducted	
		as per Cl. 3	3.4 & 3.6 of T	S respectively or	as per relevant material	code.			
	7 8	Compresse For welding	ed asbestos f	t of roundness (in	not be used for body seal	ng / gasket materi	als. m ID at nine ei	nd) shall not be more than 0.5% of pi	ne OD
	9	Valves sha	all be inspect	ed and approved	by Purchaser before des	patch.		,	,
	10	Support for	ot & lifting lug	s shall be provid	ed as per Cl. 4.16 of the	TS for Ball Valves.	instant b	Inchesial of values in the	
	11	space prov	ii cieariy writ ided for. Wh	e vaives material erever bidder ann	(equivalent or superior) of ees with valves materials	as mentioned abov	e in MECON's	data sheet, bidder shall clearly indic	ate "AGREED".
	12	Valve seat	design shall	conform to DIB-1	design .				
	DATE	701-	1	DEGODIETICI	I	40000			
KEV. NU.	DATE	∠ONE	1	REVISIONS	BY	APPKU	REFERENCES	DRG. NO.	
SECTION	Oil & Gas						\sim		
	PREPARED	CHECKED	APPROVED		CLIENT : INDRADHANU	JSH GAS GRID		NE0011111	
NAME DATE	VKS 27.03 2025	AM	HK 27.03.2025				-00 -00 - 00 - 00 - 00 - 00 - 00 - 00	MECON LIMITED	
					PROJECT: GAS PIPEL	INE GRID		<u>I</u>	
SIGN					PROJECT	B 41 1	SCALE :		REV
					UATA SHEET FOR	BALL VALVES	DATA SHEET NO	D.: MEC/23UU/05/28/M/001/DS/BV/06	0
					(ND 2 2)		I		78 of 97

				DATA SHEE	T FOR LOW TEMPER	RATURE BALL V	ALVES			
	MR Item no	.:11								
1.0	Valve Manu	facturer :		50 (01)					-	
2.0	Valve Size ((NB) (Inch)		: 50 (2")		KATING: 000#		Design Standard : API (5D	
3.0 4.0	Design Pres	sure	pecification	: 92 kg/cm2 (g)	21/002, Rev-1, Ed-1			Design Temperature, °C	: -29°C to + 65°C	
5.0	Connecting	Pipe Speci	ification:			DN 50	(2")]		
5.1	Material					ASTM A106	6 GR. B			
5.2	Diameter (C	D)				60.3m	ım	1		
5.3	Thickness					XS]		
6.0 6.1	Valve Cons	truction D	esign	· Paducad Bara		Full Boro				
6.2.	End Connec	ctions		: Flanged as per	ASME B16.5	Butt Welded as pe	r ASME B16.2	5 √		
6.3.	Flanges (wh	nerever app	olicable)	: a) RF b) Serrated	Smooth (1)	RT	nes AARH)			
6.4	Ball Mountir	ng		: Trunnion mount	ted		,]	
6.5	Valve body	type		: Fully Welded						
6.6	500 mm pup (Material,Ou	o piece (inte uter Diamet	egrally welde ter and Thick	ed to the valve on mess of pup piece	each side) : e to be same as that of th	Yes V le connecting pipe	N mentioned abo	lo		
7.0	Valve Mate	rial Specifi	ication							
	Pa	rt		Sp	pecified Material		Material Of	fered (Equivalent or superior)		
7.1	Body		A 352 Gr.LCI	B/ A350 Gr.LF2						
7.2	Ball Body Seat Ri	ngs	(A 352 Gr.LC	-B/ A350 GF.LF2) +	VP coating					
7.3	(No Casting)	-	As par Eiro	Safe Certificate	of valve manufacturer					
7.4	Stem (No cas	sting)	A 350 Gr.LF2		or varve manufacturer					
7.6	Stem Seals	0,	As per Fire	Safe Certificate	of valve manufacturer					
7.7	Trunnion		A 352 Gr.LCI	B/ A350 Gr.LF2						
7.8	Stud Bolts/ N	uts	ASTM A 19	3 Gr. B7/ A194 G	ir. 2H					
8.0	Corrosion A	llowance		: 1.5 mm		Service : Natural	Gas			
9.0	Stem extens	sion		: NA						
10.0	Operator			: Lever operated	for 2" size					
11.0 12.0	Fire Resista	nt Design I ng Require	Requirement ement		: Type test as per API e	5 FA/607		_		
					Test Pressure (min.),	Minimum D	ouration			
12 1	Hydrostatic	Test		Body	кg/cm (g) 157	(minute As per A	es) PI 6D	-		
	,			Seat	114	As per A	PI 6D]		
12.2	Air Test				5.6 - 7	As per A	PI 6D]		
13.0	Anti-Static 1	Testing Rec	quirement	: As per Standar	rd API 6D (Latest Ed.)					
14.0	Valve Paint	ing Specif	fication							
14.1	Surface pre	paration by	/ Short Blasti	ng as per grade S	SA 2 1/2, Swedish Standa	ard SIS-055 900.				
14.2	For above g	round insta	allation-Three	e coats of corrosid	on resistant paint shall be	e applied with minir	num thickness	of 300 micron		
	(Permissibl	e thickness	s in each coa	t shall be within 8	30 to 120 micron). Colour	of paint shade sha	all be RAL-703	8, however any change in	colour	
15.0	Lock Open	Requireme	nt: NA	provar stage.						
	Notes:									
	1	This Valve	Data Sheet	shall be read in co	onjunction with MECON's	Technical Specific	cation No. MEC	C/TS/05/21/002,Rev 1 ,Ed	. 1	
	2	winimum th	and Testing	aive body / adapti shall be as per er	er snall not be less than	as per ASME_B16. Sheet, MFCON's T	.54 + 1.5 mm C S., API 6D and	A other relevant standards		
	4	Stops shall	be provided	for positive align	ment of ball with ports ar	nd ensure proper in	stallation of ha	indle.		
	5	Short patte	rn valves (as	s per API 6D or ot	herwise) are not permitte	ed. Only long patter	n valves are to	be supplied.		
	6	Charpy V-n	notch & Hardi	ness test for body	/, body adaptor, end flang	ges, ball, body seat	t rings, stem &	studs / nuts shall be cond	lucted	
	7	Compresse	ed asbestos f	fibre (CAF) shall r	not be used for body seal	ling / gasket materia	als.			
	8	For welding	g end, the ou	it of roundness (i.e	e. difference between ma	aximum and minimu	ım ID at pipe e	nd) shall not be more tha	n 0.5% of pipe OD.	
	9	Valves sha	all be inspect	ted and approved	by Purchaser before des	spatch.				
	10 11	Support for Bidder shal	ot & lifting lug	gs shall be provide e valves material	ed as per Cl. 4.16 of the	IS for Ball Valves.	ainst each nart	/material of valve in the		
		space prov	ided for. Wh	erever bidder agr	ees with valves material	as mentioned abov	e in MECON's	data sheet, bidder shall o	learly indicate "AGREE	D".
	12	Valve seat	design shall	conform to DIB-1	design .					
REV. NO.	DATE	ZONE			BY	APPRD	REFERENCES	DRG NO		
SECTION	Oil & Gas							Ditto. NO.		
	PREPARED	CHECKED	APPROVED		CLIENT : INDRADHAN	USH GAS GRID				
NAME	VKS	AM	НК		LIMITED		मेकॉन ्रे	MECON LIMIT	ED	
DATE	27.03.2025	27.03.2025	27.03.2025			AST NATURAL	2001 Canp		1	
					LI NUJLUL, GAO PIPEL				1	
SIGN					PROJECT		SCALE .			REV
BIGN					PROJECT DATA SHEET FOR	BALL VALVES	SCALE : DATA SHEET NO	D.: MEC/23UU/05/28/M/001/DS/	BV/07	REV 0

				į	DATA SHEET FO	R BALL VALVES			
	MR Item n	os. :12							
1.0	Valve Man	ufacturer :							
2.0	Valve Size	(NB) (inch)		: 3/4 "		ANSI RATING	: 600#	Design Standard : ISO 1729	2
3.0 4.0	MECON's Design Pre	Fechnical Sp ssure	pecification No	o.: MEC/TS/05/21 : 92 kg/cm2 (g)	/002, Rev-1, Ed-1			Design Temperature, °C : -29°C te	o + 65°C
5.0	Connecting	Pipe Speci	fication:	DN 20 (3/4")				
5.1	Size	וחר		ASTM A 10 26.7m	m GR.B				
5.3	Thickness	50)	1	S160)				
6.0	Valve Con	struction D	esign						
6.1. 6.2.	Configuration End Conne	on ctions		: Reduced Bore Socket Welded 100mm Extension	as per ASME B16	Full Bore 5.11 A106 Gr.B (Sch. 160)	 for 3/4"		
6.3.	Flanges (w	herever app	licable)	:a) RF	C==	ath (125 to 200 mission	RT		
64	Ball Mounti	na		· Floating Ball Tv	Smo	bth (125 to 200 microin	ches AARH)	NA V	
6.5	Valve body	type		: Bolted body					
7.0	Valve Mate	erial Specifi	ication	-					
	Pa	art		Sp	ecified Material		Material Of	fered (Equivalent or superior)	
7.1	Body		ASTM A105					- /	
7.2	Ball		13% Cr Steel						
7.3	Body Seat		As per Fire Sa	afe Certificate of v	alve manufacturer		_		
7.4	Stem (No Ca	astina)	13% Cr Steel						
7.6	Stem Seal	Journg)	As per Fire S	afe Certificate of v	alve manufacturer				
7.7	Body Studs/I	Nuts	ASTM A193 G	ir. B7/ A194 Gr. 2H					
8.0	Corrosion A	Allowance		: 1.5 mm		Service : Natura	al Gas		
9.0	Stem exten	sion		: NA					
10.0	Operator			: Lever operated					
11.0	Fire Resist	ant Design F	Requirement		: Type test as per	API 6 FA/607			
12.0	Valve Test	ing Require	ement		Test Pressure (m	in) Minimum Dur	ation minutes	1	
					ka/cm ² (a)	ini.), winininani Daia	ation, minutes		
12.1	Hydrostatic	Test		Body	157	As per IS	O 17292		
				Seat	114	As per IS	O 17292		
12.2	Air Test				5.6 - 7	As per IS	50 17292]	
13.0	Anti-Static	Testing Reg	uirement	As per ISO 172	92				
14.0	Valve Paint	ing Specific	ation						
14.1	Surface pre	eparation by	Short Blastin	g as per grade SA	A 2 1/2, Swedish St	andard SIS-055 900.			
14.2	For above g	ground insta	illation-Three	coats of corrosion	resistant paint sha	all be applied with minin	um thickness of	300 micron	
	shall be fina	alized during	drawing app	roval stage.	10 120 micron). Co	iour of paint shade sha	ii be ival-7030,	nowever any change in colour	
15.0	Lock Open	Lock Close	Normally Clo	se Requirement :	NA				
	Notes:								
	1	This Valve	Data Sheet sl	hall be read in coi	ijunction with MEC	ON's Technical Specific han that specified in IS	Cation No. MEC/	I S/05/21/002,Rev 1 ,Ed. 1	in this datashoot
	3	Charpy V-n	otch test for h	ody, ball, body se	eat, gland, stem & s	studs/nuts shall be con	ducted as per A3	370. The test shall be conducted at ()°C.
		The minimu	um average a	bsorbed energy p	er set of three spec	imen shall be 27 J with	an individual mi	nimum per specimen of 22 J.	
	4	Material tes	t certificates	and hydrostatic te	st reports shall be	furnished prior to despa	atch.	Wedfer Developer 1	
	5	Detailed dir	nensional dra	wings showing cr	uss-section with pa	n numbers and materia	us snall be subm	inted for Purchaser's approval	
	6	All tests sh	all be as per f	BS EN 12266.					
	7	Valves sha	Il have ball pc	sition indicator.					
	8	Stops shall	be provided f	or positive alignm	nent of ball with po	rts and ensure proper i	nstallation of ha	ndle.	
	9 10	Lac⊓ valve Valves sha	snan De prov	ueu with a wrenc	u. v Purchaser before	dispatch			
	11	Gland pack	ing assembly	shall permit repair	r of gland packing u	under full line pressure.			
	12	Bidder shal	Il clearly write	valves material (e	equivalent or superi	or) offered by them aga	inst each part/m	aterial of valve in the	
		space prov	ided for. Whe	rever bidder agre	es with valves mate	erial as mentioned abov	e in MECON's d	ata sheet, bidder	
REV. NO		snaii clearly ZON⊑	/ indicate "AG	DESCRIPTIONS					
	UNIL	LONE	1	REVISIONS		- partie	REFERENCES	DRG. NO.	
SECTION	Oil & Gas				CLIENT : INDRAE	HANUSH GAS			
	PREPARED	CHECKED	APPROVED		GRID	LIMITED	(मेकॉन		
	27 03 2025	AM	HK 27.03.2025		Project: NORT	H -EAST NATURAL GAS	To BOOT COMPANY	MECON LIN	וויבט
	27.30.2023	21.00.2020	21.00.2020		PIPEL	INE GRID PROJECT		1	
SIGN							SCALE :		REV
					DATA SHEET F	FOR BALL VALVES	DATA SHEET NO	D.:MEC/23UU/05/28/M/001/DS/BV/08	0
<u> </u>					(IND)	~~ /	1		

				DAT	A SHEET FOR LO	OW TEMPERATRE E	ALL VALVES			
	MR Item n	os. : 13								
1.0	Valve Man	ufacturer :								
2.0	Valve Size	(NB) (inch)		: 3/4"		ANSI RATING :	600#	l	Design Standard : ISO 17292	
3.0	MECON's	Technical Sp	pecification N	lo.: MEC/TS/05/21/002	2, Rev-1, Ed-1					
4.0	Design Pre	ssure		: 92 kg/cm2 (g)				I	Design Temperature, "C : -46°C to + 65°C	
5.0	Connecting	Pipe Speci	fication:		DN 20 (3/4")	1				
5.1	Material	, , ,			ASTM A106 Gr.B					
5.2	Diameter (OD)			26.7 mm]				
5.3	Thickness				S160					
6.0	Valve Con	struction D	esian							
6.1.	Configurati	on	corgin	: Reduced Bore			Full Bore			
6.2	End Conne	ections		: Socket Welded as p	er ASME B16.11				V	
				100 mm Extension P	ups of ASTM A333	Gr.6 (Sch XS for 1" ar	d Sch. 160 for 3/4	") at both ends	i	
63	Flanges (w	herever ann	licable)	·a) BE			RT .	1		
0.5.	i langes (w	nerever app	ilcable)	b) Serrated		Smooth (125 to 200 n	nicroinches AARH)			
6.4	Ball Mount	ng		: Floating Ball type			,			
6.5	Valve body	r type		: Bolted body						
7.0	Value Mart		aatic -							
7.0	valve Mat	eriai Specifi	cation		· ·			Material Off	ered (Equivalent or	
	P	art			Specified Mate	rial		s	uperior)	
7.1	Body		ASTM A350	Gr. LF2						
7.2	Ball Barty Carat		(SS316 /AST	M A350 Gr. LF2)+ 75μE	NP coating					
7.3 7.4	Body Seat		AS per Fire	Sale Certificate of Va	ive manufacturer					
7.5	Stem (No C	astina)	SS316 (No C	asting) /ASTM A350 Gr	LF2					
7.6	Body Seal		As per Fire S	afe Certificate of valve	manufacturer					
7.7	Stem Seal		As per Fire S	afe Certificate of valve	manufacturer					
7.8	Body Studs/	Nuts	ASTM A320	Gr.L7/ ASTM A194 G	r.4					
	Corregion	Allowanaa		· 1 E mm			Sonvice · Natural	Gao		
0.0 9.0	Stem exter	sion		· 1.5 mm			Service . Natural	Gas		
10.0	Operator			: Lever operated						
11.0	Fire Resist	ant Design F	Requirement		: Type test as per	API 6 FA/607				
12.0	Valve Test	ting Require	ement							
					Test Dressure	(\min) $k = (\cos^2/\pi)$	Minimum E	Duration		
121	Hydrostatio	Test		Body	Test Flessule	(mm.), kg/cm (g) 157	As per ISC	0 17292		
				Seat		114	As per ISC	0 17292		
12.2	Air Test				5.	.6 - 7	As per ISC	0 17292		
40.0	A 11 OL 11	т <i>и</i> Б		. A						
13.0	Anti-Static	resting Req	uirement	. As per Standard AP	TOD (Latest Ed.)					
14.0	Valve Pair	ting Specif	ication							
14.1	Surface pre	eparation by	Short Blastir	ng as per grade SA 2 1	/2, Swedish Standar	d SIS-055 909.				
14.2	For above	ground insta	Illation-Three	coats of corrosion res	istant paint shall be a	applied with minimum th	ckness of 300 mic	ron		
	(Permissib	e thickness	in each coat	shall be within 80 to 12	0 micron). Colour of	paint shade shall be R	AL-7038, however	any change in co	blour	
15.0	I ock Open	Requireme	g drawing app nt · N.A .	proval stage.						
13.0	LOOK OPEN	Requirementer	n. n.a.							
	Notes:									
	1	This Valve	Data Sheet s	shall be read in conjunc	tion with MECON's	Technical Specification	No. MEC/TS/05/21	/002,Rev 1 ,Ed.	1	
	2	Minimum th	ickness of va	alve body / adapter sha	all not be less than th	at specified in ISO 1729	2 plus 1.5 mm cor	rosion allowance	e specified in this datasheet .	
	3	The minim	In average of	body, ball, body seat, (bsorbed energy per se	nanu, siem & studs/r t of three specimen	shall be 27.1 with an inc	as per A370. The t lividual minimum p	est shall be cont er specimen of ?		
	4	Material tes	at certificates	and hydrostatic test re	ports shall be furnish	ned prior to despatch.		opconnen of 2		
	5	Detailed dir	mensional dra	awings showing cross-	section with part num	bers and materials sha	Il be submitted for	Purchaser's app	roval prior to manufacture of the valves.	
		prior to mai	nufacture of t	he valves.						
	6	All tests sha	all be as per l	BS EN 12266.						
	י א	vaives sha Stons shall	n nave pall p be provided	for positive alignment	of ball with ports ar	nd ensure proper install	ation of handle			
	9	Each valve	shall be prov	vided with a wrench.	2. 2011 Inth ports dr					
	10	Valves sha	ll be inspecte	d and approved by Pu	rchaser before dispa	itch.				
	11	Gland pack	ing assembly	shall permit repair of	gland packing under	full line pressure.				
	12	Blader shal	i clearly write	e valves material (equiv	raient or superior) off	rered by them against e	acn part/material of	valve in the		
		shall clearly	/ indicate "A(GREED".	an varves material à					
REV. NO.	DATE	ZONE		DESCRIPTIONS		BY	APPRD			
				REVISIONS				REFERENCES	DRG. NO.	
SECTION	Oil & Gas	0	100000		CLIENT : INDRADH	IANUSH GAS GRID LII	AITED			
NAME	PREPARED	CHECKED AM	APPROVED HK		PROJECT					
DATE	27.03.2025	27.03.2025	27.03.2025		FINUJEUT.	NORTH -EAST N	ATURAL GAS	100 1001 Comp 51		
SIGN							PROJECT	SCALE :	REV	
					DATA S	HEET FOR BALL V	ALVES	DATA SHEET NO.	: MEC/23UU/05/28/M/001/DS/BV/09 0	
						(NB < 2")			Page 81 of 97	

						DATA SHEET FOR LTC	S PLUG VALVE	
	MR Item	nos: 14 & 1	7					
1.0	Valve Mar	nufacturer :						
2.0	Valve Size	DN (inch):	DN 200 (8")	,DN 50 (2")			ANSI Rating : 600#	Design Standard : API 6D
3.0	MECON's	Technical S	pecification	No.: MEC/	TS/05/62/003, Rev-2			
4.0	Connectin	g Pipeline D	esign Press	sure:	92 Kg/cm2(g)			Design Temperature, °C : -46°C to 65°C
5.0 5.1	Connection Material	ng Pipe Spe	ecification	:	DN 200 (8") API 5L Gr.B PSL 2	DN 50 (2") ASTM A106 GR. B	}	
5.2	Diameter	(OD), mm (mm) / Sch	edule	:	219.1 14.3mm	60.3 \$80		
5.5	Valvo Co	estruction [Docian		14.000	000	1	
6.1.	Pattern	istruction i	Jesign		: Short		Regular √	Venturi
6.2.	End Conn	ections			: Flanged both ends : Butt Weld both en	ds	V	Flanged as per ASME B 16.5 Butt Weld as per ASME B16.25
					: Flanged one end,	butt weld other end		
					: Socket weld both	ends		Socket Weld as per ASME B16.11
6.3.	Flanges				: a) RF	FF		RTJ NA V
					b) serrated	ptri (125 to 200 mi	croincnes AARH)	
7.0	vaive Mat	erial Speci Part	rication		Materia	1	Mate	erial Offered (Equivalent or Superior)
7.1	Body			A 352 Gr. l	LCB/A 350 Gr. LF2			
7.2	Plua			(SS316/ A with 75 µE	352 Gr.LCB/A 350 Gr. NP coating	LF2)		
7.3	Cover			ASTM A35	0 Gr. LF2/ A352 Gr. LC	В		
7.4	Stem Sea	1		SS 316 (No PTEE/Gran	o casting) / A 350 Gr. L	F2		
7.6	Stud Bolts	/ Nuts		ASTM A32	0 Gr.L7 / ASTM A194 0	Gr.4		
8.0	Corrosion	Allowance			: 1.5 mm		Service : Na	tural Gas
9.0	Location				: Above Ground	V	Buried	
10.0	Stem Exte	nsion Requ	irement		: Yes	No	V	
11.0 12.0	Gear Oper Actuator F	rator Requir Requiremen	rement It		: Yes : Yes	No No	V	Gear operated for 8" Lever operated for 2"
13.0	Fire Resist	ant Design	Requiremer	nt	: Type-Test as per	Standard API 6FA/ API 6	07	
14.0	Valve Tes	tina Reaui	rement					
14.1		Hydrost	atic Test	Mir	n. Test Pressure	Minimum Du	uration,	
			Body		kg/cm2(g)	minute		
			Seat		114	As per Ar	PI 6D	
14.2		Air	Test		5.6 - 7	As per AF	PI 6D	
15.0	Valve Pai	nting Speci	ification					
15.1 15.2	Surface pr	eparation b	y Short Blas	sting as per	grade SA 2 1/2, Swedi	sh Standard SIS-055 909. int shall be applied with p	ninimum thickness o	f 300 micron
15.2	(Permissit	ole thickness	s in each coa	at shall be v	vithin 80 to 120 micron)	. Colour of paint shade sha	all be RAL-7038, how	vever any
	change in	colour shall	be finalized	during drav	wing approval stage.			
16.0	Lock Oper	n/ Lock Clos	e Requirem	ent: N.A.				
	Notes:							
	1. 2	This Valve I	Data Sheet s and Testing	shall be read	d in conjunction with N per attached OAP this	AECON's Technical Specific Data Sheet, MECON'S T S	cation No. MEC/TS/	05/62/003, Rev2 relevant standards.
	3.	Stops shall	be provided	for positiv	e alignment of plug wi	th ports and ensure prope	r installation of han	dle.
	4.	Charpy V- r	notch & Hard	dness test fo	or body, plug, cover, ste	em & studs/nuts shall be co	onducted as per Clau	ise No.: 3.4 & 3.5
	5.	Compresse	ed asbestos	fibre (CAF)	shall not be used for be	ody sealing / gasket materi	als.	
	6. 7	Minimum a	Il pressure c	ontaining a	nd controlling parts of the	he valve shall be provided	with EN 10204-3.2 c	ertificate.
	8	Bidder shal	l clearly write	e valves ma	aterial (equivalent or su	perior) offered by them ag	ainst each part/mate	rial of valve in the
		space provi	ided for. Wh	erever bidd	ler agrees with valves r	naterial as mentioned abov	/e in MECON's data	sheet, bidder
	9	Minimum th	nickness of v	valve body /	adapter / cover shall n	ot be less than that specifie	ed in ASME B16.34.	
REV. NO.	DATE	ZONE		DESCRIPTI	ONS	BY	APPRD	
OF OT O				REVISION				REFERENCES DRG. NO.
SECTION	PREPARED	as CHECKED	APPROVED		CLIENT : INDRADHA	NUSH GAS GRID LIMITEI	ر ا	
NAME	VKS	AM	нк			NORTH -EAST NATURA	L GAS PIPELINE	MECON LIMITED
DATE	27.03.2025	27.03.2025	27.03.2025		PROJECT:	GRID (PHASE- I & II) PROJECT		au 21. Cues
SIGN						(NR > 2")		DATA SHEET NO.: MEC/23VC/05/28/M/001/DS/PV/01 REV

						DATA SHEET FOR LTO	S PLUG VALVE			
	MR Item	nos.15								
1.0	Valve Ma	nufacturer :								
2.0	Valve Size	DN (inch): D	ON100 (4")				ANSI Rating : 600#		Design Standard : API 6D	
3.0	MECON's	Technical Sp	ecification	No.: MEC/T	S/05/62/003, Re	ev-2				
4.0	Connectir	ng Pipeline De	esign Press	sure:	92 Kg/cm2(g)				Design Temperature, °C : -29°C to	65°C
5.0	Connecti	ng Pipe Spe	cification							
5.1 5.2	Material Diameter	(OD), mm		:						
5.3	Thickness	(mm) / Sche	dule	:						
6.0 6.1	Valve Co Pattern	nstruction D	esign		· Short		Regular V		Venturi	
6.2.	End Conn	ections			: Flanged bol	th ends	V		Flanged as per ASME B 16.5	
					: Butt Weld b : Flanged one	oth ends e end. butt weld other end			Butt Weld as per ASME B16.25	
					: Socket weld	d both ends			Socket Weld as per ASME B16.11	
6.3.	Flanges				: a) RF b) Serrated	V FF Smooth (125 to	200 microinches AAR	RTJ H)	NA ✓	
7.0	Valve Ma	terial Specifi	cation							
		Part	oution		Mate	erial	Mat	erial Offered (Ec	quivalent or Superior)	
7.1	Body			A 352 Gr.L0 (SS316 /A 3	CB/ A350 Gr.LF2 352 Gr.LCB/ A 35	50 Gr.LF2) with 75micron	8			-
7.2	Plug			ENP Coatir	ig					
7.3	Stem			A 352 Gr.L0 SS 316 (No	CB/ A350 Gr.LF2 casting) / A350	Gr. LF2				-
7.5	Stem Sea	l (Note		PTFE/Grap	hite	104 C= 4				
7.6	Stud Bolts	5/ INUIS		A51101 A520	JGI.L7/ASTMA	.194.GI.4				
8.0	Corrosion	Allowance			: 1.5 mm		Service : Na	itural Gas		
9.0 10.0	Location Stem Exte	ension Requir	rement		: Above Grou : Yes	ind √ No	Buried			
11.0	Gear Ope	rator Require	ement		: Yes	N				
12.0	Actuator Fire Resis	Requirement tant Design R	leauiremer	nt	: Yes : Type-Test a	as per Standard API 6FA	API 607	Lever operated	for 4" size)	
	V-h T									
14.0	valve res	Hydrostat	tic Test	Min. Te	est Pressure	Minimum D	uration,]		
			Dedu	kg	/cm2(g)	minut	es PLCD	-		
			Seat		114	As per A As per A	PI 6D			
14.2		Air Te	est		5.6 - 7	As per A	PI 6D]		
15.0	Valve Pai	nting Specif	ication							
15.1 15.2	Surface p	reparation by	/ Short Bla: allation-Th	sting as per ree coats of	grade SA 2 1/2, 9 corrosion resist	Swedish Standard SIS-05 ant paint shall be applied	5 909. with minimum thick	ness of 300 mic	ron	
	(Permissi change in	ble thickness colour shall b	in each co be finalized	at shall be w I during drav	vithin 80 to 120 m ving approval sta	nicron). Colour of paint sh age.	ade shall be RAL-703	38, however any		
16.0	Lock Ope	n/ Lock Close	Requirem	ent: N.A.						
	Notes:									
	1. 2	This Valve Da	ata Sheet s	hall be read	in conjunction	with MECON's Technical	Specification No. ME	C/TS/05/62/003	3, Rev2 andards	
	3.	Stops shall b	e provideo	for positive	alignment of pl	ug with ports and ensure	proper installation	of handle.		
	4.	Charpy V- no	otch & Haro	iness test fo	r body, plug, cov	ver, stem & studs/nuts sha	Il be conducted as po	er Clause No.: 3.	4 & 3.5	
	5.	Compressed	asbestos	fibre (CAF)	shall not be used	for body sealing / gasket	materials.			
	6. 7	Minimum all	pressure c	ontaining ar	id controlling par	ts of the valve shall be proceed to be the state of the valve shall be proceeded as a state of the state of t	ovided with EN 1020	4-3.2 certificate.		NA
	8	Bidder shall o	clearly writ	e valves ma	terial (equivalent	or superior) offered by th	em against each par	t/material of valv	e in the	
		space provid	led for. Wh indicate "A	erever bidde	er agrees with va	lves material as mentione	ed above in MECON'	s data sheet, bid	der	
	9	Minimum thio	ckness of v	alve body /	adapter / cover s	hall not be less than that	specified in ASME B	16.34.		
REV NO		ZONE		DESCRIPTIC	INS	RV	APPRD			
INEV. INU.	DATE	ZUNE		REVISION	3	DT	הי ר תע	REFERENCES	DRG. NO.	
SECTION	V OIL & G	as			CLIENT : INDR	ADHANUSH GAS GRID	LIMITED	()		
NAME	VKS	AM	HK			NORTH -EAST NATURA	AL GAS PIPELINE	मेलान	MECON LIMITED	
DATE	27.03.2025	27.03.2025	27.03.2025		PRUJECT:	PROJECT		SEOI CIMP		
SIGN						(NB > 2")		DATA SHEET NO .:	MEC/23VC/05/28/M/001/DS/PV/02	REV

						DATA SHEET FOR PLU	G VALVE							
	MR Item r	nos: 16												
1.0	Valve Mar	ufacturer :												
2.0	Valve Size	DN (inch):	DN50(2")				ANSI Rating : 600#		Design Standard : API 6D					
3.0	MECON's	Technical Sp	pecification	No.: MEC/1	S/05/62/003, R	ev-2								
4.0	Connectin	g Pipeline D	esign Press	ure:	92 Kg/cm2(g)				Design Temperature, °C : -29°C to 65	5°C				
5.0 5.1	Connectir Material	ng Pipe Spe	ecification	:		DN 50 (ASTM A106	2") GR. B							
5.2	Diameter	(OD), mm		:		60.3								
5.3	Thickness	(mm) / Sch	edule	:		580		l						
6.0 6.1	Valve Cor Pattern	struction E	Design		· Short		Regular V		Venturi					
6.2.	End Conne	ections			: Flanged bot	h ends			Flanged as per ASME B 16.5					
					: Butt Weld b	oth ends	√		Butt Weld as per ASME B16.25					
					: Flanged one : Socket weld	e end, butt weld other end I both ends			Socket Weld as per ASME B16.11					
6.3.	Flanges				: a) RF	FF Smooth (405 to		RTJ	NA V					
7.0	Volue Met	arial Crocold	liastian		b) Serrated	Shidoth (125 to	200 microinches AAR	п)						
7.0	vaive Mát	Part	icatiOII		Mate	erial	Mate	erial Offered (E	quivalent or Superior)					
7.1	Body			ASTM A21	6 Gr. WCB/ A23	4 Gr. WPB								
7.2	Plua			(ASTM A2 ENP Coati	16 Gr. WCB/A23 ng	34 Gr. WPB) + 75 microns								
7.3	Cover			ASTM A21	6 Gr. WCB/ A23	4 Gr. WPB								
7.4	Stem			(AISI 4140	+ 75 microns EN	IP Coating)/ AISI 410								
7.5	Stem Seal Stud Bolts	/ Nuts		ASTM A19	ohite 3 Gr. B7/ A194 0	Gr. 2H								
8.0	Corrosion	Allowance			: 1.5 mm		Service : Na	tural Gas						
					Ab O		During							
9.0	Stem Exte	nsion Requi	rement		: Above Grou : Yes	ina v No								
11.0	Gear Oper	ator Requir	ement		: Yes	No	V							
12.0	.0 Gear Operator Requirement : Yes No V .0 Actuator Requirement : Yes No V .0 Actuator Requirement : Yes No V													
13.0	Fire Resist	ant Design I	Requiremen	t	: Type-Test a	as per Standard API 6FA/	API 607							
14.0 14.1	Valve Tes	Hydrost	ement atic Test	Min. To	est Pressure	Minimum Du	uration,]						
			Body	- Ng	157	As per AF	s PI 6D							
			Seat		114	As per AF	PI 6D							
14.2		Air	Test		5.6 - 7	As per AF	PI 6D							
15.0	Valve Pair	nting Speci	fication											
15.1	Surface pr	eparation b	y Short Blas	ting as per	grade SA 2 1/2,	Swedish Standard SIS-055	909.							
15.2	For above (Permissih	ground inst	tallation-Thr	ee coats of at shall be w	corrosion resist vithin 80 to 120 m	ant paint shall be applied nicron) Colour of paint sha	with minimum thick de shall be RAI -70	ness of 300 mic 38 however any	ron					
	change in	colour shall	be finalized	during drav	ving approval sta	ige.		o, nowever any						
	1		- D											
16.0	Lock Oper	/ LOCK Clos	e Requireme	ent: N.A.										
	Notes:													
	1.	This Valve I	Data Sheet s	hall be rea	d in conjunction	with MECON's Technical S	Specification No. M	EC/TS/05/62/00	3, Rev2					
	2. 3.	Stops shall	be provided	snall be as for positiv	per attached QA e alignment of n	lug with ports and ensure	proper installation	other relevant s of handle.	เลทนสานิร.					
	4.	Charpy V- r	notch & Hard	iness test fo	or body, plug, co	ver, stem & studs/nuts sha	Il be conducted as p	er Clause No.: 3	3.4 & 3.5					
	-	of TS respe	ectively.	6hra (0 • 5)	aball r - t b	d fan bada Hir da ba	mataria!-							
	5. 6.	Compresse Minimum =	all pressure of	nore (CAF) containing	snall not be used and controlling r	a for body sealing / gasket parts of the valve shall be i	materials. provided with FN 10	204-3.2 certific	ate.					
	7	For welding	g end, the ou	t of roundn	ess (i. e. differen	ce between maximum and	minimum ID at pipe	end) shall not b	be more than 0.5% of pipe OD.					
	8	Bidder shal	I clearly write	e valves ma	aterial (equivalen	t or superior) offered by th	em against each pa	t/material of val	ve in the					
		space prov	iaed tor. Wh indicate "A	erever bidd	er agrees with va	aives material as mentione	ed above in MECON	s data sheet, bio	ader					
	9	Minimum th	nickness of v	alve body /	adapter / cover	shall not be less than that s	specified in ASME B	16.34.						
REV. NO.	DATE	ZONE		DESCRIPTI	ONS	BY	APPRD							
OF OTION				REVISION				REFERENCES	DRG. NO.					
SECTION	PREPARED	CHECKED	APPROVED		CLIENT : INDR	ADHANUSH GAS GRID L	IIVIITED							
NAME	VKS	AM	НК			NORTH -EAST NATURA	L GAS PIPELINE	मेकॉन	MECON LIMITED					
DATE	27.03.2025	27.03.2025	27.03.2025		PROJECT:	GRID (PHASE- I & II) PROJECT		Soot Carps						
SIGN						(NB > 2")		DATA SHEET NO .:	MEC/23VC/05/28/M/001/DS/PV/03	REV				
						(2 ב מוון				U				

SPARES LIST (START-UP & COMMISSIONING)

- BALL AND PLUG VALVES



OIL & GAS SBU, DELHI

LIST OF COMMISSIONING SPARES AND ACCESSORIES FOR START-UP & COMMISSIONING FOR VALVE & ACTUATOR

SI. No.	Item No.	Description	Quantity
1.		Sealant Gun	One No.
2.		Sealant	One lot
3.			
4.			
5.			

NOTES:

1. Bidder to include the start-up and commissioning spares for valves & actuators in the quoted price for Ball Valves.

2. Vendor shall provide sufficient amount of sealant to cater one filling of all the ordered valves.

3. Each successful bidder shall supply above mentioned commissioning spares subject to applicability of secondary sealant injection as defined in Cl. 4.10 of TS.

To be filled, signed and stamped by Bidder.

Bidder's Seal

Signature of Bidder

Client:	Project:	Document No.:	Rev.	Date:
INDRADHANUSH GAS	NORTH -EAST NATURAL GAS		No.	
GRID LIMITED	PIPELINE GRID PROJECT	MEC/23UU/05/28/M/001/S002/CS	0	27.03.2025

SPARES LIST (2 YEARS NORMAL OPERATION)



OIL & GAS SBU, DELHI

LIST OF SPARES AND ACCESSORIES FOR TWO YEARS OF NORMAL OPERATION FOR VALVE

SI. No.	Item No.	Description	Quantity
1.			
2.			
3.			
4.			
5.			

NOTE:

Bidder shall quote separately spares for two years normal operation for valves as per price schedule performa.

To be filled, signed and stamped by Bidder.

Bidder's Seal

Signature of Bidder

Client:	Project:	Document No.:	Rev. No.	Date:
INDRADHANUSH	NORTH -EAST NATURAL GAS			
GAS GRID LIMITED	PIPELINE GRID PROJECT	MEC/23UU/05/28/M/001/S003/OS	0	27.03.2025

																F	ORM NO. 11.20(4.4)F-09 REV-0
		CONTRACTOR					QUALI	TY AS	SURAN	NCE P	LAN	PROJECT :	NORTH -E	AST NATUR	AL GAS PIPELINE GRID F	PROJECT	
		ORDER NO. & DATE						F	OR			PACKAGE N	NO.:05/51/	23UU/IGGL/	/002A		
1	मेकॉन	SUB-CONTRACTOR					STRUC	TURAL A	AND ME	CHANI	CAL	PACKAGE N	AME : BAI	L VALVE A	ND PLUG VALVE		
-0	9001 Compar	ORDER NO. & DATE						EQU	IPMEN	ſ							
INST	RUCTIONS FOR	FILLING UP :					CODES FOR EXTENT OF	INSPECTIO	N, TESTS,	TEST CER	TIFICATES	6 & DOCUM	ENTS :				
1. 2.	QAP shall be so of assembly/su having same so Use numerical	ubmitted for each of the ub-assembly & part/compecification. codes as indicated for	he equipr mponent · extent o	ment separatel or for group of inspection &	y with break f equipment tests and	up	Code Description 1. Visual 2. Dimensional 3. Fitment & Alignm	nent	Code 18 19 20	e Dese . Amplitude . Sponge T . Dust/ Wa	<i>cription</i> e Test est ter Ingress	Test	<i>Code</i> 34. 35. 36.	Description Internal In Hardness T Spark Test	7 spection Report Fest for Lining	Code DOCUMENT D1. Approved C D2. Information reference d	r <i>S:</i> GA drawings and other rg/ stamped
	submission of	test certificates & docu	uments. A	Additional code	s & descriptio	n	4. Physical Test (Sa	mple)	21	. Friction Fa	actor Test		37.	Calibration	ico Tost	drgs release	ed for mfg.
	and equipment	spection & tests may	be added	a as applicable	for the plant		6. Ultrasonic Test	ampie)	22	. Adnesion . Performai	rest nce Test/Ch	aracteristic	38. 39.	Fase of Ma	intenance	D3. Relevant ca D4. Bill of math	/Item no./
3.	Separate ident	ification number with	quantity i	for equipment	shall be		7. Magnetic Particle	Test (MPI)	20	Curve			40.	Fire Test (Type Test)	Identificatio	n
	indicated when	ever equipment havin	g same s	specifications b	elonging		Radiography Tes	t	24	. No Load/	Free Runnir	ng Test	41.	Charpy V-I	Notch Test	D5. Matchmark	s details
	to different fac	ilities are grouped tog	ether.	Column E for	ach itom		9. Dye Penetration	Test	25	. Load/ Ove	erload Test	da	42.	Operationa	Il Torque Test	D6. Line/ Layou	t diagram
4.	Fstimated weight	this may be indicated	whereve	column-5 lor e	s are not		10. Metallographic E 11. Welder's Qualific	ation &	20		al Test	eus	43.	ENP (Elect	roless Nickel Placing)	D7. Approved e	rection
	available.	gries may be maleated	mereve	a decidal weight	S are not		Weld Procedure	Test	28	. Geometric	cal Accuracy	,	44.	Painting		D8. Unpriced su	ıb P.O. with
							12. Approval of Test	and Repair	29	. Repeatab	ility and Pos	itioning	45.	Anti-Static	Test	specification	n and amend-
							Procedure			Accuracy			46.	Hydrostatio	DIB-1	ments, if ar	iy
		SUB VENDOR		KEY IO SYM	BOLS :		13. Heat Treatment		30	. Proving I Surface P	est reparation		47	Functional	Toct	D9. Calibration	Certificate of
	MFR	: MANUFACTURER		** : TEST TO BE	PERFORMED IF A	PPI ICABI F	15. Leakage Test		32	. Sunace P	urer's Test (ertificates	48.	Pneumatic	DIB-1	and gauges	
	TPI	: DESIGNATED THIR		Y INSPECTION	AGENCY		16. Balancing		52	for bough	it-out items		101	. neumade	515 1	D10. X-Ray Repo	irts
	н	: HOLD					17. Vibration Test		33	. IBR/ Othe	er Statutory	agencies	49.	Cyclic Test		<i>,</i> ,	
	R	: REVIEW								compliance	e certificate	:	50.	Strip test			
<u> </u>	W	: WITNESS		FOLITPMEN	Τ ΠΕΤΔΙΙ S				1		INSPECTIO		<u>د</u>		Test Certificates &	Accentance Criteria	REMARKS/
SI.	Descri	ption (with equipment		Identification	Quantity	Unit	Manufacturer's	Expected	Raw Ma	aterial and I	In-Process	Final I	spection/	Test by	Documents to be	Standards/ IS/ BS/	SAMPLING PLAN
No.	heading	, place of use and brie	ef	No.	No./M	Weight	Name and Address	Schedule of	s s	tage Inspec	tion			,	submitted to MECON	ASME/ Norms and	
		specifications)		(MR Item No.)	(Kg)		Final Inspn	. MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	
1		2		3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.0	Dell and Dlar	(-h		A.1 to A.14 8		*	*	*									
	Ball and Plug V	aives		A.15 to A.18	Refer	*	т 	*									
	1				MR/SOR				10.00	ttochod	oot 2 to 10						
									As per a	ittached she	eet 2 to 10						
	1	Г				1	1	·				1				1	
															AEC /221 11 1/0E /20 /M /224 /	040.0004	
	For MECON (S	tamn & Signature)				For CONTR								QAP NO. I	MEC/2300/05/28/M/001/	QAP-002A	KEV O
							(Stamp & Signature)							SHEET 1	OF 10		v
		L															

									QAP No.	: MEC/23UU/05/28	/M/001/QAP-002A			F	ORM NO. 11.20(4.4)F-09 REV-0	
	EQUIPMENT D	DETAILS]	INSPECTIO	N AND TES	TS		Test Certificates &	Acceptance Criteria	Ins	spection Co	des	REMARKS
SI	I. Description (with equipment heading, place of use and brief	Identification No.	Quantity No./M	Unit Weight	Raw Mat	terial and I age inspec	n-Process	Final	inspection/	Test by	Documents to be submitted to MECON	Standards/ IS/ BS/ ASME/ Norms and	&	Sampling P	'lan	
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	1
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.0	01 Body	Material As per MR/ Alternate Material accepted			1,2	-	-	-	-	-	1. D1 2. Report	 D1 Relevant Material Standard Manufacturer's Specification 	H	R	R	
		by MECON			4	4	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's D.S. 	H	Н	R	
					5	5	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	H	Н	R	
					6 **	6 **	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	H	W	R	Forgings, welds, wrought weld ends
					7 **	7 **	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	H	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)
					8 **	8 **	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	H	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	H	R	R	
					35	35	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON'S T.S. MECON'S D.S. 	Н	Н	R	
					41	41	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	H	H	R	

		QAP No.	: MEC/23UU/05/28/	/M/001/QAP-002A			F	DRM NO. 11.20(4.4)F-09 REV-0								
	EQUIPMENT D	ETAILS				I	NSPECTION	N AND TES	ſS		Test Certificates &	Acceptance Criteria	In	spection Co	des	REMARKS
SI.	Description (with equipment	Identification	Quantity	Unit	Raw Mat	erial and I	n-Process	Final I	nspection/	Test by	Documents to be	Standards/ IS/ BS/	&	Sampling P	lan	
No.	heading, place of use and brief	No.	No./M	Weight	sta	age inspect	ion				submitted to MECON	ASME/ Norms and				
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.02	Closure/ Body Adapter/ Tail Piece	Material			1.2	-	-	-	-	-	1. D1	1. D1	Н	R	R	
		Manufacturer			,						2. Report	2. Relevant Material				
		to indicate										Standard				
		(to be										3. Manufacturer's				
		approved										Specification				
		by MECON)			4	4	_	_	_		Material Test	1 Polovant Material	н	н	D	
		by MECON)			т	т Т	_	_	_	_	Cortificator	Standard		''		
											Certificates					
						-					Material Test	2. MECON S D.S.				
					5	5	-	-	-	-	Material Test	1. Relevant Material	п		ĸ	
											Certificates					
												2. MECON'S T.S.				
					C**	C**					Test Deneut	1 ACME DIC 24		14/	- D	Fausings welds
					0	0,00	-	-	-	-	Test Report	1. ASME B10.34,	п	VV V	ĸ	Forgings, welds,
																wrought weld enus
												Z. MECON'S T.S.				
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34,	н	W	R	Wet MPI for 100%
												Appendix-II				of internal surfaces
												2. MECON's T.S.				of all castings &
																forgings & bevel
																surfaces (MPI/ DP)
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34,	Н	W	R	All castings as per
												Appendix-I				clause 5.1.4 b) of
												2. MECON's T.S.				T.S., all welds, weld
																ends of all cast valves
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34,	Н	W	R	Bevel Surfaces
												Appendix-III				(by MPI/ DP)
												2. MECON's T.S.				
					13	13	-	-	-	-	Report/ Material Test	1. Relevant Material	Н	R	R	
											Certificates	Standard				
					35	35	-	-	-	-	Material Test	1. Relevant Material	н	н	R	
											Certificates	Standard				
												2. MECON's T.S.				
												3. MECON's D.S.				
					41	41	<u> </u>	<u> </u>		-	Material Test	1 Relevant Material	н	н	P	
					71	1 1	-	-		-	Certificates	Standard				
												3 MECON'S D.S.				
												J. MECON S D.S.				

	QAP No. : MEC/23UU/05/28/M/001/QAP-002/														FC	DRM NO. 11.20(4.4)F-09 REV-0
	EQUIPMENT D	DETAILS				I	NSPECTION	AND TES	rs		Test Certificates &	Acceptance Criteria	In	spection Co	des	REMARKS
S	I. Description (with equipment	Identification	Quantity	Unit	Raw Mat	terial and I	n-Process	Final I	nspection/	Test by	Documents to be	Standards/ IS/ BS/	&	Sampling P	lan	
N	 heading, place of use and brief 	No.	No./M	Weight	sta	age inspect	ion				submitted to MECON	ASME/ Norms and		_		
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	
1	1 2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.	03 Top Cover	Material Manufacturer to indicate (to be approved			1,2	-	-	-	-	-	1. D1 2. Report	 D1 Relevant Material Standard Manufacturer's Specification 	Н	R	R	
		by MECON)			4	4	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's D.S. 	Н	Н	R	
					5	5	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	Н	R	
					6 **	6 **	-	-	-	-	Test Report	1. ASME B16.34, Annex-E 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
					7 **	7 **	-	-	-	-	Test Report	1. ASME B16.34, Annex-C 2. MECON's T.S.	Н	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)
					8 **	8 **	-	-	-	-	Test Report	1. ASME B16.34 Annex-B 2. MECON's T.S.	H	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	R	R	R	
					35	35	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	Н	R	
					41	41	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	R	Н	R	

										QAP No.	: MEC/23UU/05/28/	M/001/QAP-002A			F	DRM NO. 11.20(4.4)F-09 REV-0
	EQUIPMENT D	DETAILS				I	INSPECTION	AND TES	rs		Test Certificates &	Acceptance Criteria	In	spection Co	des	REMARKS
S	. Description (with equipment	Identification	Quantity	Unit	Raw Mat	erial and I	n-Process	Final I	nspection/	Test by	Documents to be	Standards/ IS/ BS/	&	Sampling Pl	lan	
No	heading, place of use and brief	No.	No./M	Weight	sta	age inspect	tion				submitted to MECON	ASME/ Norms and				
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
1.0	4 Trunnion (for Trunnion Mounted	<u>Material</u>			1,2	1,2	-	-	-	-	1. D1	1. D1	Н	R	R	
	Valves)	Manufacturer									2. Report	2. Relevant Material				
		to indicate										Standard				
		(to be										3. Manufacturer's				
		approved										Specification				
		by MECON)			4	4	-	-	-	-	Material Test	1. Relevant Material	н	н	К	
											Certificates					
					5	5		-	-	_	Material Test	1 Relevant Material	н	н	R	
					5						Certificates	Standard				
												2. MECON's T.S.				
												3. MECON's D.S.				
					13	13	-	-	-	-	Report/ Material Test	1. Relevant Material	н	R	R	
											Certificates	Standard				
					/2 **	/2 **					1 Test Deport				D	
					45	45	-	-	-	-	2 Material Test	2 MECON'S D.S.	п		ĸ	
											Certificates for	3. ASTM B733 Std.				
											composition,	4. Manufacturer's				
											hardness,	Specification				
											thickness &					
											integrity					
1.0	15 Ball	Material			1,2	1,2	-	-	-	-	1. D1 2. Bonort	1. D1 2. Polovant Material	н	R	R	
		Alternate									z. Report	Standard				
		Material										3. Manufacturer's				
		accepted										Specification				
		by MECON			4	4	-	-	-	-	Material Test	1. Relevant Material	н	н	R	
											Certificates	Standard				
											M	2. MECON'S D.S.				
					5	5	-	-	-	-	Material Test	1. Relevant Material	н	н	R	
											Certificates					
												3. MECON's D.S.				
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34,	н	w	R	Forgings, welds,
												Appendix-IV				wrought weld ends
												2. MECON's T.S.				
															_	
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34,	Н	W	R	Wet MPI for 100%
																of all castings &
																forgings & bevel
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34,	н	w	R	All castings as per
												Appendix-I				clause 5.1.4 b) of
												2. MECON's T.S.				T.S., all welds, weld
																ends of all cast valves

QAP No. : M												/M/001/QAP-002A			F	ORM NO. 11.20(4.4)F-09 REV-0
	EQUIPMENT D	ETAILS	_	-		I	NSPECTION	AND TEST	ſS		Test Certificates &	Acceptance Criteria	In	spection Co	des	REMARKS
SI	. Description (with equipment	Identification	Quantity	Unit	Raw Mat	terial and I	n-Process	Final I	nspection/	Test by	Documents to be	Standards/ IS/ BS/	&	Sampling P	lan	
No	heading, place of use and brief	No.	No./M	Weight	sta	age inspect	ion			1	submitted to MECON	ASME/ Norms and		1	1	4
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34,	Н	W	R	Bevel Surfaces
												Appendix-III				(by MPI/ DP)
												2. MECON's T.S.				
					13	13	-	-	-	-	Report/ Material Test	1. Relevant Material	н	R	R	
											Certificates	Standard				
					35	35	-	-	-	-	Material Test	1. Relevant Material	н	н	R	
										Certificates	Standard					
												2. MECON's T.S.				
					41	41					Mahadal Tash	3. MECON's D.S.				
					41	41	-	-	-	-	Material Test	1. Relevant Material	н	н	ĸ	
										Certificates	2 MECON'S T S					
												3. MECON's D.S.				
						42										
					43	43	-	-	-	-	1. Test Report	1. MECON'S T.S.	н	н	ĸ	
											2. Material Test	2. MECON'S D.S.				
											composition,	4. Manufacturer's				
											hardness,	Specification				
											thickness &					
											integrity					
1.0	16 Stem	Material			1,2	1,2	-	-	-	-	1. D1	1. D1	н	R	R	
		As per MR/									2. Report	2. Relevant Material				
		Alternate										Standard 2 Manufacturor's				
		accepted										Specification				
		by MECON			4	4	-	-	-	-	Material Test	1. Relevant Material	н	н	R	
		by HECON									Certificates	Standard				
												2. MECON's D.S.				
					5	5	-	-	-	-	Material Test	1. Relevant Material	Н	Н	R	
											Certificates	Standard				
												2. MECON'S T.S.				
					6**	6**	<u> </u>			<u> </u>	Test Peport	1 ASME B16 34	н	W/	P	Forgings welds
					0	0	-	-	-	-	Test Report	Annendix-IV		VV		wrought weld ends
												2. MECON's T.S.				ought melu chu3
1					7**	7**	-	-	-	-	Test Report	1. ASME B16.34,	Н	W	R	Wet MPI for 100%
1												Appendix-II				of internal surfaces
												2. MECON's T.S.				of all castings &
1					0**	0**					Tost Bonst	1 ACME P16 24	Ц	14/		All costings as por
1					0	0	-	-	-	-	TEST REPORT	Appendix-I		vv	ĸ	clause 5.1.4 h) of
1												2. MECON's T.S.				T.S., all welds, weld
																ends of all cast valves

		M/001/QAP-002A			F	ORM NO. 11.20(4.4)F-09 REV-0										
	EQUIPMENT [DETAILS				I	INSPECTION	AND TES	ГS	-	Test Certificates &	Acceptance Criteria	Ins	spection Co	des	REMARKS
[SI. Description (with equipment heading, place of use and brief	Identification No.	Quantity No./M	Unit Weight	Raw Mat	terial and I age inspect	n-Process tion	Final I	nspection/	Test by	Documents to be submitted to MECON	Standards/ IS/ BS/ ASME/ Norms and	&	Sampling P	lan	
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	-
F	1 2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	Н	W	R	Bevel Surfaces (by MPI/ DP)
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	Н	R	R	
					35	35	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	Η	R	
					41	41	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	H	R	
					43	43	-	-	-	-	 Test Report Material Test Certificates for composition, hardness, thickness & integrity 	 MECON'S T.S. MECON'S D.S. ASTM B733 Std. Manufacturer's Specification 	Н	H	R	
1.0	.07 Seats	Material As per MR/ Alternate Material accepted			1,2	1,2	-	-	-	-	1. D1 2. Report	 D1 Relevant Material Standard Manufacturer's Specification 	Н	R	R	
		by MECON			4	4	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's D.S. 	Н	Н	R	
					5	5	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	Η	R	
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-II 2. MECON's T.S.	Н	W	R	Wet MPI for 100% of internal surfaces of all castings & forgings & bevel surfaces (MPI/ DP)

			: MEC/23UU/05/28/	M/001/QAP-002A			ORM NO. 11.20(4.4)F-09 REV-0										
	EQUIPMENT D	ETAILS				Ι	NSPECTION	N AND TEST	ſS		Test Certificates &	In	spection Co	des	REMARKS		
SI. No.	Description (with equipment heading, place of use and brief	Identification No.	Quantity No./M	Unit Weight	Raw Mat sta	terial and I age inspect	n-Process tion	Final I	nspection/	Test by	Documents to be submitted to MECON	Standards/ IS/ BS/ ASME/ Norms and	&	& Sampling Plan			
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON		
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C		
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-I 2. MECON's T.S.	Н	W	R	All castings as per clause 5.1.4 b) of T.S., all welds, weld ends of all cast valves	
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-III 2. MECON's T.S.	Н	W	R	Bevel Surfaces (by MPI/ DP)	
					13	13	-	-	-	-	Report/ Material Test Certificates	1. Relevant Material Standard	н	R	R		
						35	35	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	Н	R	
					41	41	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	Н	R		
					43	43			-	 Test Report Material Test Certificates for composition, hardness, thickness & integrity 	 MECON'S T.S. MECON'S D.S. ASTM B733 Std. Manufacturer's Specification 	Н	Н	R			
1.08	Bolting Material (Studs & Nuts)	<u>Material</u> As per MR/ Alternate Material accepted			1,2	1,2	-	-	-	-	1. D1 2. Report	 D1 Relevant Material Standard Manufacturer's Specification 	Н	R	R	Alongwith thickness measurement for ENP Coating.	
		by MECON			4	4	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's D.S. 	Н	Н	R		
					5	5	-	-	-	-	Material Test Certificates	 Relevant Material Standard MECON's T.S. MECON's D.S. 	Н	Н	R		
					6**	6**	-	-	-	-	Test Report	1. ASME B16.34, Appendix-IV 2. MECON's T.S.	Н	W	R	Forgings, welds, wrought weld ends	

			: MEC/23UU/05/28/	M/001/QAP-002A			ORM NO. 11.20(4.4)F-09 REV-0									
	EQUIPMENT D	_		I	NSPECTION	AND TES	rs		Test Certificates &	In	spection Co	REMARKS				
SI.	Description (with equipment	Identification	Quantity	Unit	Raw Material and In-Process		Final Inspection/ Test by			Documents to be	Standards/ IS/ BS/	& Samplin		lan		
No.	heading, place of use and brief	No.	No./M	Weight	sta	age inspect	ion				submitted to MECON	ASME/ Norms and				-
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON		Documents	MFR/SV	TPI	MECON	
1	2	3	4	5	8	9	10	11	12	13	14	15	16A	16B	16C	
					7**	7**	-	-	-	-	Test Report	1. ASME B16.34,	H	W	R	Wet MPI for 100%
												Appendix-II				of internal surfaces
												2. MECON's T.S.				of all castings &
																forgings & bevel
					O dut	e du la					-					surfaces (MPI/ DP)
					8**	8**	-	-	-	-	Test Report	1. ASME B16.34,	н	W	R	All castings as per
																Clause 5.1.4 D) of
												Z. MECONS 1.5.				ands of all cast values
					9**	9**	-	-	-	-	Test Report	1. ASME B16.34,	Н	W	R	Bevel Surfaces
												Appendix-III				(by MPI/ DP)
												2. MECON's T.S.				
					12	12					Poport/ Matorial Tost	1 Polovant Matorial	н	D	D	
					15	15	-	-	-	-	Certificates	Standard				
												Standard				
					41	41	-	-	-	-	Material Test	1. Relevant Material	н	н	R	
											Certificates	Standard				
												2. MECON's T.S.				
												3. MECON's D.S.				
1.09	Assembled Valves				-	-	-	1,2	1,2	1,2	Report	1. D1	н	н	W	
					-	-	-	3	3	3	Report	2. MECONS 1.5.	н	н	w	
					-	-	-	14	14	14	1. Report	1. D1	H	H	Ŵ	
											2. Test Certificates	2. MECON's T.S.				
												4. API 6D Std./				
												BS EN 12266				
			1					45	45	45		(as applicable)				
					-	-	-	15	15	15	1. Report	2. MECON's T.S.	н	Н	vv	
											2. Test Certificates	3. MECON's D.S.				
			I									4. API 6D Std./				
												(as applicable)				
								40	40	40	1. Report	1. API 607/ API 6FA /	R	R	R	
											2. Test Certificates	BS EN ISO 10497				
												2. MECON's T.S.				
												3. MECON's D.S.				
								42	42	42	1. Report	1. MECON's T.S.	н	Н	w	
											2. Test Certificates	3. API 6D Std.				
												(as applicable)				
					-	-	-	37	37	37	Certificates		-	R	R	
					-	-	-	44	44	44	1. Report	1. MECON's T.S.	н	W	R/W	
											2. Test Certificates	3. Manufacturer's				
												Specification				

			: MEC/23UU/05/28/	ORM NO. 11.20(4.4)F-09 REV-0												
	EQUIPMENT DE	TAILS				I	INSPECTION	AND TES	rs		Test Certificates &	Acceptance Criteria	In	spection Co	des	REMARKS
SI.	Description (with equipment	Identification	Quantity	Unit	Raw Mat	terial and I	n-Process	Final Inspection/ Test by			Documents to be	Standards/ IS/ BS/	&	Sampling P	lan	
No.	heading, place of use and brief	No.	No./M	Weight	sta	stage inspection					submitted to MECON ASME/ Norms and					
	specifications)			(Kg)	MFR/SV	TPI	MECON	MFR/SV	TPI	MECON	1	Documents		TPI	MECON	
1	2	3	4	5	8	9	10	11	11 12 13		14	15	16A	16B	16C	
					-	-	-	45	45	45	 Report Test Certificates 	 MECON'S T.S. MECON'S D.S. API 6D Std. / BS EN ISO 17292 (as applicable) 	Н	Н	W	
					-	-	-	46	46	46	 Report Test Certificates 	 MECON's T.S. API 6D Std. (as applicable) 	Н	Н	w	Applicable for TMBV
					-	-	- 47 47		47	47	 Report Test Certificates 	 MECON'S T.S. API 6D Std. / BS EN ISO 17292 (as applicable) 	Н	Н	W	Refer Note 3 of Table 2 of TS no. MEC/ TS / 05 / E5 / 002A
					-	-	-	48	48		 Report Test Certificates 	 MECON's T.S. API 6D Std. (as applicable) 	н	Н	w	Applicable for TMBV
					-	-	-	49	49	49	 Report Test Certificates 	 MECON'S T.S. MECON'S D.S. 	Н	н	W	
					-	-	-	50	50	50	 Report Test Certificates 	 MECON's T.S. MECON's D.S. 	Н	Н	W	Refer cl 21.0 of notes to MR
1.10	Complete documentation check and compilation							3	3	3	 Final Report Final Certificates 	1. MECON's T.S. 2. API 6D Std. / BS EN ISO 17292 (as applicable)	Н	Н	-	
1.11	Complete and compiled documentation check and dispatch clearance				-	-	-	3	3	3	 Final Report Final Certificates 	1. MECON's T.S. 2. API 6D Std. / BS EN ISO 17292 (as applicable)	Н	-	н	
1.12	Actuator Tests					As per A	ctuator Q	Juality As	surance	Plan (to	be submitted by ve	ndor for approval)			
1																

VENDOR shall establish approved WPS-PQR-WPQ for the weldings duly witnessed by TPIA .
 Vendor shall do RT for Body adapter to PUP piece welding and RT report shall be reviewed by MECON & TPIA
 Vendor shall do UT/RT for Bodt to Body adapter welding witnessed by TPIA

		QAP NO.: MEC/23UU/05/28/M/001/QAP-002A	REV
For MECON (Stamp & Signature)	For CONTRACTOR/ SUB-CONTRACTOR		0

1

							011.0.1.1			NOF		N							FORM NO. 1	1.20(4.4)F-09 REV-0	
1		CONTRACTOR	-																		
		ORDER NO. & DATE				FOR					PACKAGE										
2	मेकीन	SUB-CONTRACTOR			INSTRUMENTATION									PACKAGE NAME :							
	Soot Cont	ORDER NO. & DATE			EQUIPMENT									ITEM NAME : GAS POWERED ACTUATOR							
			•																		
INSTRUCTIONS FOR FILLING UP : COD						CODES FOR EXTENT	S FOR EXTENT OF INSPECTION, TESTS, TEST CERTIFICATES & DOCUMENTS														
1.	QAP shall be s	submitted for each of th	Code Description		Code Description				7		Code				tion	Code DOCUMENTS:					
	of assembly/si	ub-assembly & part/cor	1. Visual		18.	3. Amplitude Test					34.			nterna	Inspection Report	D1. Approved GA draw	ings				
	having same s	specification.				2. Dimensional		19.	. Sp	onge Test	t					b	by Cont	ractor	D2. Information and ot	her	
2.	Use numerical	I codes as indicated for	extent of inspec	ction & test	s and	Fitment & Alig	gnment	20.	. Du	ust/ Water	Ingres	s Test		35.		H	lardne	ss Test	reference drg/ star	nped	
	submission of	test certificates & docu	ments. Addition	nal codes &	description	4. Physical Test	(Sample)	21.	. Fri	iction Fact	tor Test			36.		S	Spark T	est for Lining	drgs released for m	nfg.	
	for extent of it	nspection & tests may t	be added as app	Discription tor t	ine plant	5. Chemical Tes	t (Sample)	22.	. Ad	inesion Te	est a Tort/C	haractori	tic	37.		6	alibrat	ion Novico Tost	D3. Relevant catalogue	es /	
3	Separate ident	itification number with c	quantity for equi	inment shal	ll be	7 Magnetic Part	icle Test (MPI)	23.	. ге Сп	inve	e rest/c	Jiaiacteri	suc	30.		F	arety i ase of	Maintenance	Identification	0.7	
5.	indicated whe	rever equipment having	a same specifica	itions belon	aina	8. Radiography	Test	24.	4 No Load/ Free Running Test					39. 40			Fire Tes	t (Type Test)	D5. Matchmarks details	5	
	to different fac	cilities are grouped toge	ether.		5 0	9. Dye Penetrati	on Test	25.	. Loa	ad/ Overlo	oad Tes	st		41.		C	Charpy	V-Notch Test	D6. Line/ Layout diagra	am	
4.	Weight in kilog	grams must be indicate	d under Column	n-5 for each	item.	10. Metallographi	c Exam.	26.	. Me	easuremer	nt of Sp	eeds		42.			Operati	onal Torque Test	D7. Approved erection		
	Estimated wei	ights may be indicated v	wherever actual	weights ar	e not	11. Welder's Qua	lification &	27.	7. Accoustical Test					43.			ENP (EI	ectroless Nickel Plating)	procedures		
	available.					Weld Procedu	ire Test	28.	. Ge	Geometrical Accuracy							xecuti	n	D8. Unpriced sub P.O.	with	
-						12. Approval of I	est and Repair	29.	. Re	peatabilit	y and P	ositioning		44.				**- T*	specification and a	mend-	
			KEV TO SVM			13 Heat Treatme	nt	30	ACC	Accuracy Proving Test				45. 46				atic Double Block &	D9 Calibration Certifics	ate of	
	CONTR	: CONTRACTOR	* : MFR/ CONTRA	ACTOR - AS APP	PLICABLE	14. Pressure Test		31.	. Su	Inface Pres	oaration	ı		40.		В	Bleed T	est	all measuring instru	uments	
						15. Leakage Test								47. Fu			unctio	nal Test :			
						a) Piston Sea											a) Elect	rical and pneumatic functional			
						 b) Pneumatic 	Connection									te	est.				
																	o) Insu	ation Test of Electrical			
																C	compor	ents.			
																C	:) Chec	k of operating time control.			
																a	i) Unec	k of limiting device operation.			
) No ic Doerati	ons with the minimum required			
																	eeding	pressure.			
									Manufacturaria Taat Cartificataa							f)) Manu	al Override functional test.			
	MFR	: MANUFACTURER	** : TEST TO BE P	PERFORMED, IF	APPLICABLE	14 Delensing		32.	. Ma	anufacture	er's lest	t Certifica	es	48				tia Daubla Black 8	and gauges		
	п	: HULD				TO. Balancing		Tor bought-out				1115			48. Pli			ILIC DOUDLE BIOCK &	DTU. X-Ray Reports		
	R	: REVIEW				17. Vibration Tes	t	33.	IBR/ Other Statutory agencies				s				Bleed T	est			
	W	: WITNESS						compliance certificate													
	Р	: PERFORM																			
			EQUIPME	ENT DETAIL	.S							INSPECTI	ON AND TESTS					Test Certificates &	Acceptance Criteria	REMARKS/	
SI.	Descriptio	on (with equipment	Identification	Quantity	Unit	Manufacturer's	Expected	R	aw Materia	ial and In-Process		F	inal Inspect	ion/ Test I	by		Documents to be	Standards/ IS/ BS/	SAMPLING PLAN		
No.	heading, p	blace of use and brief	NO. (As per MP)	No./M	Weight (Kg)	Name and Address	Schedule of Final Inson		Stage	Inspectio	on							submitted to MECON	ASME/ Norms and	1	
	sp	celled tonsy	(AS per Mit)		(1(g)		rinarinspii.	MFF	२	TPI		MECON	MFR	TP	1	MECO	N		Documents		
1		2	3	4	5	6	7	8		9		10	11	12	2	13		14	15	16	
								5.6/7/8/9	6/	7/8/9*.			1.2.3.15								
								*,14,15(a)	14	4,15(a),			(b),31,4	1,2,3,15(1	1,2,3,15(
GAS POWERED ACTUATOR As per PO -					,42,23	P 4	42,23	W#	-	4,47 P	b),44,47	Wb	b),44,47	R	1,2,3,5,6,7,8,9,14,15(a),15(b),23	D2,D3,D4,D6, MECON TS	100%				
	<u>.</u>		<u> </u>	I				5	R		32,33 R	31,32,33	R 3	31,32,33	R	31,32,33,42,44,47					
	* lests as appl	licable shall be carried o	r.								·										
#Tests shall be witnessed for storage tank & actuator cylinder.																					
	NUTE - 3.2 II		se provided.											+							
1																					
1																C	DAP NC	. MEC/05/E5/STD./QAP/AV		REV	
1	For MECON (S	Stamp & Signature)			For CONTF	RACTOR/ SUB-CONTRACT	OR													0	
1						(Stamp & Signature)										S	SHEET	1 OF 1			
1							L														