





Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0017	Contract No. 66-0215	
	TECHNICAL SPECIFICATIONS – ON-OFF PLUG/BALL VALVES				
				Rev	00

<p>tkIS India / Vendor</p> <p>Category Codes (Submission Purpose)</p> <table style="width: 100%;"> <tr><td><input type="checkbox"/></td><td>1</td><td>For Approval</td></tr> <tr><td><input type="checkbox"/></td><td>2</td><td>For Review / Comments</td></tr> <tr><td><input type="checkbox"/></td><td>3</td><td>For Information</td></tr> <tr><td><input type="checkbox"/></td><td>4</td><td>For Engineering</td></tr> <tr><td><input type="checkbox"/></td><td>5</td><td>For Enquiry</td></tr> <tr><td><input type="checkbox"/></td><td>6</td><td>For Order Placement</td></tr> <tr><td><input type="checkbox"/></td><td>7</td><td>Final & Approved</td></tr> <tr><td><input type="checkbox"/></td><td>8</td><td>Released for Construction</td></tr> </table> <hr/> <p>Acceptance Codes (Approval Codes)</p> <table style="width: 100%;"> <tr><td><input type="checkbox"/></td><td>1</td><td>Approved</td></tr> <tr><td><input type="checkbox"/></td><td>2</td><td>Approved for Manufacturing / Fabrication with Comments as marked</td></tr> <tr><td><input type="checkbox"/></td><td>3</td><td>Not Approved / Resubmit</td></tr> <tr><td><input type="checkbox"/></td><td>4</td><td>Retained for Information / Records</td></tr> <tr><td><input type="checkbox"/></td><td>5</td><td>Reviewed</td></tr> <tr><td><input type="checkbox"/></td><td>6</td><td>Reviewed as Noted / Resubmit</td></tr> </table> <p>Remarks for AC2 : This marked-up drawings is hereby approved for fabrication / manufacturing and shall be re-submitted after revision. This drawing should be revised only to the extent of tkIS India / Owner / Client comments. Any other changes made by you will not be considered unless clearly highlighted in covering letter asking for approval.</p> <p>This approval / review does not absolve the supplier from the full responsibility for design and fabrication.</p> <p>Date : ___/___/___ Name : _____</p>	<input type="checkbox"/>	1	For Approval	<input type="checkbox"/>	2	For Review / Comments	<input type="checkbox"/>	3	For Information	<input type="checkbox"/>	4	For Engineering	<input type="checkbox"/>	5	For Enquiry	<input type="checkbox"/>	6	For Order Placement	<input type="checkbox"/>	7	Final & Approved	<input type="checkbox"/>	8	Released for Construction	<input type="checkbox"/>	1	Approved	<input type="checkbox"/>	2	Approved for Manufacturing / Fabrication with Comments as marked	<input type="checkbox"/>	3	Not Approved / Resubmit	<input type="checkbox"/>	4	Retained for Information / Records	<input type="checkbox"/>	5	Reviewed	<input type="checkbox"/>	6	Reviewed as Noted / Resubmit	<p>tkIS India / Owner / Client</p> <p>Category Codes (Submission Purpose)</p> <table style="width: 100%;"> <tr><td><input type="checkbox"/></td><td>1</td><td>For Approval</td></tr> <tr><td><input type="checkbox"/></td><td>2</td><td>For Review / Comments</td></tr> <tr><td><input type="checkbox"/></td><td>3</td><td>For Information</td></tr> <tr><td><input type="checkbox"/></td><td>4</td><td>For Engineering</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>5</td><td>For Enquiry</td></tr> <tr><td><input type="checkbox"/></td><td>6</td><td>For Order Placement</td></tr> <tr><td><input type="checkbox"/></td><td>7</td><td>Final & Approved</td></tr> <tr><td><input type="checkbox"/></td><td>8</td><td>Released for Construction</td></tr> </table> <hr/> <p>Acceptance Codes (Approval Codes)</p> <table style="width: 100%;"> <tr><td><input type="checkbox"/></td><td>1</td><td>Approved</td></tr> <tr><td><input type="checkbox"/></td><td>2</td><td>Approved for Manufacturing / Fabrication with Comments as marked</td></tr> <tr><td><input type="checkbox"/></td><td>3</td><td>Not Approved / Resubmit</td></tr> <tr><td><input type="checkbox"/></td><td>4</td><td>Retained for Information / Records</td></tr> <tr><td><input type="checkbox"/></td><td>5</td><td>Reviewed</td></tr> <tr><td><input type="checkbox"/></td><td>6</td><td>Reviewed as Noted / Resubmit</td></tr> </table> <p>Date : ___/___/___ Name : _____</p>	<input type="checkbox"/>	1	For Approval	<input type="checkbox"/>	2	For Review / Comments	<input type="checkbox"/>	3	For Information	<input type="checkbox"/>	4	For Engineering	<input checked="" type="checkbox"/>	5	For Enquiry	<input type="checkbox"/>	6	For Order Placement	<input type="checkbox"/>	7	Final & Approved	<input type="checkbox"/>	8	Released for Construction	<input type="checkbox"/>	1	Approved	<input type="checkbox"/>	2	Approved for Manufacturing / Fabrication with Comments as marked	<input type="checkbox"/>	3	Not Approved / Resubmit	<input type="checkbox"/>	4	Retained for Information / Records	<input type="checkbox"/>	5	Reviewed	<input type="checkbox"/>	6	Reviewed as Noted / Resubmit
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Rev.	Status	Description	Date	Prepared	Date	Checked	Date	Approved	AC	
Based on : PIN-LES-INS-017 08-2017				<h1 style="margin: 0;">Barcode</h1>						Category Code: -
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	TECHNICAL SPECIFICATIONS – ON-OFF PLUG/BALL VALVES				
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DOCUMENTS ATTACHED:

SR. NO.	DESCRIPTION	NO. OF PAGES	DOCUMENT NO.	LATEST REV.
1.				
2.				

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STANDARD GENERAL SPECIFICATION

1.0 GENERAL

This specification covers the general requirements of Plug/ball type control valves. Detailed specifications are as per the individual data sheets attached.

The order of precedence in case of conflict should be

1. Individual data sheets
2. Project specific requirement
3. Standard General Specification



2.0 TYPE AND CONSTRUCTION

2.1 Body/Trim

- 2.1.1 Body casting shall be free from blowholes, porosity, cracks and other defects. Repairs of any nature on such defects are not acceptable. Body shall be of long pattern design.
- 2.1.2 Wetted parts coming in contact with fluid like shaft, shaft bearings, spacers, gland, retainer ring, fasteners like studs, bolts, pins, required for assembly; shall be of the same material as material of ball/plug specified. If not, vendor shall confirm that the same are suitable for the service under consideration.
- 2.1.3 For valves in cryogenic services vendor shall ensure that the shaft mechanism does not seize for the temperatures specified.
- 2.1.4 Wherever sandwich type body is specified, the same shall be provided with at least 4 nos. centering holes to enable proper centering of body during installation at site. The diameter/spacing and PCD of these holes shall be as per flange size, rating and standard mentioned in individual specification sheets.
- 2.1.5 The valves shall be designed and leakage class shall be checked as per following standards:

Sr. No.	Type of Valve	Design standard	Leakage class standard
a.	Metal seated ball valve	ISO 17292 / API 608	API 598
b.	Soft / Metal seated ball valve	ISO 14313 (API 6D)	ISO 5208
c.	Fire safe ball valve	API 607	API 598
d.	Metal seated plug valve	API 599	API 598
e.	Metal seated plug valve	BS 5353 / MSS	MSS SP 61
f.	Sleeved/lined plug valve	API 6D	ISO 5208
g.	Sleeved/lined plug valve	BS 5353 / MSS	MSS SP 61

- 2.1.6 Material for bonnet bolts & nuts (non-wetted parts) shall be minimum as per ASTM A193 Gr.B7 and ASTM A194 Gr.2H respectively. Refer individual data sheets for any other special requirement.
- 2.1.7 Control valve shall be sized to ensure that noise level at a distance of one meter from valve body is ≤ 80 db at maximum flow conditions. Noise level calculations shall be submitted by the vendor.

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2.1.8 The allowed stroking time shall be governed by process requirement. Generally, for control valves, equipped with positioner, maximum stroke time shall be 10 seconds up to control valve size 4" or smaller. Stroke time shall be maximum 15 second for control valve with size 6" and above. For critical control valves, like anti surge control valve, stroke time may be in the range of 2-5 seconds. For interlock valves, this could be in the range of 2 seconds. Requirement given in individual data sheet shall govern.

2.2 Actuator

- 2.2.1 This shall be rotary piston type as specified. Rotary vane type actuators are not acceptable.
- 2.2.2 Actuator shall be designed for satisfactory operation even if air supply pressure falls to 4 kg/cm² (g). Actuator shall be designed for 125% of the torque specified by the valve vendors, for the respective fluid service.
- 2.2.3 Actuator shall have an external valve open/close indication as a standard.
- 2.2.4 Vent ports of actuator shall be plugged with a SS whistle to prevent entry of dust / insects in the actuator casing.
- 2.2.5 Actuator shall be self-lubricating type. No external filter lubricator set shall be used.
- 2.2.6 Hand wheels if specified shall be with suitable clutch mechanism to permit selectively automatic / manual operation. Suitable reduction gear shall be considered if necessary for ease of operation.
- 2.2.7 Wherever air vessel is required to achieve safe condition of a valve (as in a double acting rotary piston actuator), the volume of the vessel shall be sufficient for at least 3 valve operations. The air vessel shall preferably be mounted on actuator yoke itself with additional supports as required. For sizing of air vessel normal air pressure shall be considered as 5.5 4 kg/cm²(g), minimum air pressure as 4 4 kg/cm²(g).

Following specifications shall govern for fabrication of air vessel:

- a. Design pressure : 10 4 kg/cm²(g)
 - b. Design temperature : 50°C
 - c. Design/inspection code : ASME SECTION VIII DIVISION I
 - d. Material
 - i Shell/dished end : SA 515 Grade 60
 - ii Nozzle/pipes : SA53 Grade B or SA106 Grade B (Seamless)
 - iii Flanges/fittings (3000#) : SA 105
 - iv Supports : SA 515 Grade 60 or IS 226
 - v Minimum thickness of : 5 mm. Add corrosion shell and dished end allowance of 1 mm.
- 2.2.8 Fire safe ball valves specified with spring return actuators shall be supplied with fusible plug in pneumatic tubing which melts in case of fire to vent out air from the actuator and bring the valve to safe condition.
- 2.2.9 Actuators shall be painted `green` for all air to open (FC) valves, `red` for all air to shut (FO) valves and `grey` for fail lock (FL) valves.



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2.3 Packing Glands and Gland Bolting

- 2.3.1 For valves other than plug valves, stem seal shall be generally provided by a bolted packing assembly; any other arrangement may be accepted if explicitly specified or with prior approval of the purchaser. For plug valves, vendor-specific design will be accepted.
- 2.3.2 Vertically split glands shall not be used.
- 2.3.3 Packing glands threaded into body, cover or stem shall not be used unless explicitly specified and approved by the purchaser.
- 2.3.4 Gland bolts shall pass through the holes in the packing gland; the use of open slots is not permitted on any portion of the packing gland.
- 2.3.5 The packing gland, the gland flange or the gland bolting shall not be used for any purpose other than stem sealing (e.g. for providing position stops).
- 2.3.6 Extension bonnets shall be considered for design temperatures below 0°C and above 230°C; other vendor-specific designs suitable for specified temperatures may also be accepted with prior approval of the purchaser.
- 2.3.7 It shall be possible to adjust the packing without disassembly of valve actuator parts; the valve and actuator assembly shall be designed to provide access to the gland parts for this purpose.
- 2.3.8 The external parts of the valve and actuator assembly and the gland packing shall be clearly visible to permit easy visual identification of any process fluid leakage through stem seal.
- 2.3.9 The valve and actuator assembly shall be designed to avoid build-up of process fluid pressure between the valve and the actuator due to stem seal leakage and to avoid ingress of the leaking process fluid into the actuator.
- 2.3.10 Valve packing containing asbestos in any form is not acceptable.
- 2.3.11 The material for stem seals shall be suitable for use at the maximum temperature and the maximum pressure for the specified service.
- 2.3.12 The selected packing /sealing shall be compatible with the process and the environmental conditions for each application.
- 2.3.13 Packing in the form of a single-piece spiral shall not be used.

2.4 Positioner

- 2.4.1 This shall be pneumatic or electro pneumatic type as indicated in individual data sheets.
- 2.4.2 Positioner shall be force balance type with adjustable zero and span. It shall have pressure gauges for signal and output as minimum.

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- 2.4.3 It shall be possible to reverse the action of positioner easily without any addition/deletion of any parts.
- 2.4.4 Split range operation shall be possible.
- 2.4.5 Enclosure protection shall be IP55 minimum. Flameproof enclosure wherever specified shall conform to IS2148, EN50014/18 or equivalent standard.

3.0 **ACCESSORIES**

3.1 **Limit Switch**

- 3.1.1 This shall be mounted on actuator with provision for easy adjustment at site.
- 3.1.2 Micro switch type limit switch wherever specified shall be mounted and terminated in a weatherproof junction box IP65 (and flameproof to IS2148, EN50014/18 or equivalent standard wherever specified). The junction box shall be mounted integrally with the actuator and shall have 2 nos. M20 X 1.5 threaded entries for user's cable glands. One of the entries shall be plugged with M20 X 1.5 aluminum plug. A common junction box shall be provided for two limit switches. Whenever a rotary control valve is supplied with both positioner and limit switch, the limit switch shall be integral with positioner.
- 3.1.3 Inductive type limit switch wherever specified shall be 2-wire type (conforming to DIN 19234/NAMUR standard)/3 wire type as specified. Model number shall be as given in the approved vendors' list. Flexible leads from the switch shall be glanded and terminated in a junction box mounted integrally with the actuator. A common junction box shall be considered for two switches. The junction box shall be weatherproof to IP65 (and flameproof as per IS2148, EN50014/18 or equivalent standard wherever specified). It shall have two nos. M20 X 1.5 threaded entries for user's cable glands. One of the entries shall be plugged with an aluminum plug.



3.2 **Solenoid Valve**

- 3.2.1 This shall be mounted on actuator and fully tubed. Wherever double acting actuators are used, 5 way solenoid valves shall be single coil type. Vent port on the solenoid valve shall be suitably plugged with a SS whistle to prevent entry of dust/insects. For details, refer attached specifications.

3.3 **Air Filter Regulator**

- 3.3.1 This shall be mounted on the actuator and fully tubed. Following specifications will govern:

- | | | | |
|---|----------------------------------|---|---------------------------------|
| a | Material of body | : | Die Cast Aluminum |
| b | Material of spindle & drain plug | : | SS304 |
| c | Filter | : | Sintered bronze, size 5 micron. |
| d | Connection size | : | ¼" NPT(F) |

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e Outlet pressure gauge : Required

AFR Type : Relieving

3.4 **Air Lock Relay/Booster Relay**

3.4.1 This shall be mounted on the actuator and fully tubed. For details, refer attached specifications.

4.0 **IDENTIFICATION**

4.1 Each valve shall be provided with the following details engraved on a metal nameplate fixed securely to the actuator.



- a. Manufacturer's name.
- b. Tag number.(This shall also be painted in bold letters on the actuator casing for easy readability)
- c. Manufacturer's serial number.
- d. Valve model number.
- e. Actuator model number and spring range.
- f. Position on air failure.
- g. Body material. (This shall also be stamped on body/flange.)
- h. Pressure rating. (This shall also be stamped on body/flange.)
- i. Body size. (This shall also be stamped on body/flange.)
- j. Trim material and characteristics.
- k. Cv.
- l. Gland packing.
- m. Statutory approvals if any (e.g. IBR, fire safe, etc.)

4.2 In addition to the above, following comments (wherever applicable) shall be painted in `bold' letters on a separate plate fixed to the actuator yoke.

- a. "OXYGEN SERVICE! SPECIAL CLEANING REQUIRED".
- b. "CHARACTERISED CAMS USED IN POSITIONER".

5.0 **PAINTING**

5.1 Valve body, bonnet, actuator, mounting plates for accessories etc., shall be degreased and derusted before applying two coats of epoxy primer and two coats of final epoxy paint.



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6.0 PACKING

- 6.1 For packing following special requirements shall be taken care of by the vendor prior to dispatch.
- a. All pressure gauges on positioner shall be removed and packed separately. Positioner entries shall be covered with plugs.
 - b. Air filter regulator shall be disconnected from tubing, removed and packed separately.
 - c. Limit switches shall be covered with thermocole/packing foam.
 - d. All other accessories mounted on the yoke or actuator housing shall be covered with thermocole / packing foam.
 - e. Both ends of valves shall be covered with plastic caps suitably to avoid ingress of outside dust in the body during storage at erection site.
 - f. Valve assembly along with mounted accessories shall be firmly fixed to the wooden crate so that there is no relative movement of body with respect to crate which may damage mounted accessories/tubing.
 - g. Pressure gauges of positioner, air filter regulator and any other accessories packed separately (as mentioned in a & b above) shall be packed in small boxes for each valve separately and tag no. of valve shall be mentioned on the box.

7.0 INFORMATION REQUIRED WITH THE BID

- 7.1 Vendor shall submit the following with the bid.
- a. Catalogues/literature for all models of valves, actuators, positioners etc. including Cv curves, actuator sizing details etc.
 - b. Catalogues/specifications of all bought out items like solenoid valves, air filter regulators, limit switches etc.
 - c. Cv calculation sheets.
 - d. Noise level calculation sheets.
 - e. Specification giving break torque and seating torque required for ball/plug/eccentric plug valves according to size and rating.
 - f. Flameproof/intrinsic safety certification and Approval of Chief Controller of Explosives (CCoE), Petroleum and Explosives Safety Organization (PESO) wherever applicable.
 - g. Spare parts required for 2 years continuous trouble-free operation.
 - h. Commissioning spares.
 - i. Compliance declaration.

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**PROJECT SPECIFIC REQUIREMENTS –
PLUG / BALL ON-OFF VALVES**

Following specification covers the project specific requirements:

The order of precedence in case of conflict should be

1. Individual data sheets
2. Project specific requirement
3. Standard General Specification

Sr. No.	STD GS Clause No.	Project specific requirements	Remarks
	2.1.7	Acceptable noise level at a distance of one meter from valve body is <= 85 db	
	3.1.3	Inductive limit switch shall be 2 wire NAMUR type P&F make.	
	3.2	Brief Specs for Solenoid Valve (SOV): SOV shall be direct operated. SOV shall be universal type. Power Supply : 110 VAC Coil Insulation: Class "H", Cable entry: ½" NPT(F) with built in junction box suitable for termination of 2.5 Sq.mm wires, MOC of body shall be of SS316 and that of Coil housing shall be Aluminum Epoxy Coated. Pneumatic connection: 1/4" NPT(F) or as specified in individual data sheets. SOV shall be weather proof as per IP-65 and certified for area class specified in individual data sheets. SOV shall be duly mounted & tubed to the actuator	
	3.2	Solenoid Valve size and type, the tubing size, the actuator air connection size, and the air/filter regulator capacity shall be determined by the valve vendor to meet the minimum stroking time requirements specified for the valve.	
		Spares: AFR- 2 no's of each type Proximity limit switch- 2 no's of each type SOV- 2 no's of each type Actuator- 1 no's of each type	

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INSPECTION AND TESTING

The vendor shall be fully responsible for completing all the in-house testing and test reports as indicated below.

The same shall be submitted to clients / tkIS – India / Illrd party minimum 7 days before inspection. Any delay due to late submission will not be considered as reason for delay in delivery.

Following tests shall be offered as a minimum. Percentages indicated are for each lot offered for inspection. These are indicative only and the quantity of valves selected as well as the inspection procedure followed, shall be at the sole discretion of inspection engineer of the clients / tkIS-India / Illrd party. The inspecting authority may, if desired, request for additional tests over and above those listed below or decide to waive the inspection.



SR. NO.	DESCRIPTION	INSPECTION QUANTITY			REMARKS
		VENDOR	CLIENTS / tkIS-India	III RD PARTY	
1.	Visual inspection for quantity, conformity with specifications, supply of accessories etc.	100%	100%		
2.	Hydrostatic test on body as per applicable standard.	100%	10%		
3.	Actuator leak test as per manufacturer's standard.	100%	10%		
4.	Standard for seat leakage test shall be as per table in clause 2.1.5	100%	100%		For all metal seated valves and critical shutdown valves. For others.
		100%	10%		
5.	Cv test	-	-		As per vendor's standard
6.	Calibration test with positioner	100%	10%		
7.	Tests on limit switches for proper operation	100%	50%		Isolation amplifier required for inductive switches shall be provided by the vendor.
8.	Tests on other accessories	100%	10%		
9.	Tests for ON/OFF operating items for critical shutdown valves.	100%	100%		
10.	Radiography of casting of valves	100%	-		Review.
11.	Hydro test for jacket	100%	10%		Witness
12.	Radiography for jacket welding	100%	100%		Review.

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Test and Calibration Instruments



Vendor shall arrange for all the test and calibration instruments and provide all the facilities/assistance for inspection and testing. Accuracy of test and measuring instruments used by the vendor shall be at least 2 times better than the accuracy of the instrument being tested. All the test and measuring instruments shall be calibrated in a standard laboratory and the vendor shall produce valid calibration documents for the purposes of verification. The calibration shall be traceable to any of the approved national laboratories.

Hand held configurator (HART or Foundation Fieldbus as applicable) required for testing communication and configuration.

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DOCUMENTATION REQUIREMENTS

SR. NO.	DOCUMENT	FOR INFORMATION AFTER PO/LOI				FOR APPROVAL AFTER PO/LOI				FINAL COPIES	
		TIME SCH. WEEK	COPIES (NOTE A)			TIME SCH. WEEK	COPIES (NOTE B)			S (1)	P (1)
			CLIENTS	tkIS-India			CLIENTS	tkIS-India			
1.	Installation, Operation and Maintenance manual for valve, actuator and positioner	---	---	---	---	---	---	---	---	3	4
2.	Installation, Operation and maintenance manual for all bought out items (air vessel included)	---	---	---	---	---	---	---	---	3	4
3.	Parts list for 1 and 2 above	---	---	---	---	---	---	---	---	3	4
4.	Dimensional drawings	2	1S+1P	1S+1P	---	---	---	---	---	3	4
5.	Tubing diagrams (for special schemes only)	---	---	---	2	1S+1P	1S+1P	---	---	3	4
6.	Internal test reports	Min. 7 days before Inspection	1S+1P	1S+1P	---	---	---	---	---	3	4
7.	Material test certificates for original suppliers	Min. 7 days before Inspection	1S+1P	1S+1P	---	---	---	---	---	3	4
8.	IBR certificates in form IIC wherever applicable	Min. 7 days before Inspection	1S+1P	1S+1P	---	---	---	---	---	3	4
9.	Intrinsic safety/flameproof certification for specified items including bought outs	Min. 7 days before Inspection	1S+1P	1S+1P	---	---	---	---	---	3	4
10.	CCoE Approval wherever applicable	Min. 7 days before Inspection	1S+1P	1S+1P	---	--	---	---	---	3	4



Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0017	Contract No. 66-0215	
	TECHNICAL SPECIFICATIONS – ON-OFF PLUG/BALL VALVES				
				Rev	00

1. ABBREVIATIONS:

- S : Soft Copies (.pdf files) (1 copy to client + 2 copies to tkIS (India))
P : Prints

2. NOTES:



- a) For Vendor documentation, wherever review/approval is specified, soft copy shall be sent to anand.nalawade@thyssenkrupp.com with copy to tkisindia.pacltf@thyssenkrupp.com. Once the document is reviewed / approved, final sets of documents shall be sent to tkIS DMS office for further compilation as per following address. These shall not be dispatched to site directly.
- tkIS India Private Limited, UHDE House,
L.B.S. Marg, Vikhroli (West)
Mumbai 400083, India
Attention: Mr. K. S. Srinivasan (Telephone: +91-22-4047 8131)
- b) Drawings to be submitted for approval shall be submitted as per timeline indicated above and in line with order specifications. Any deviations with respect to order specifications shall be listed separately. In absence of same, order specification will be governing document. It is vendor responsibility to get drawings approved and if required vendor to visit tkIS office to get drawings approved. Delivery period shall be as per terms and conditions of Purchase order and any delay in drawing approval will not be considered as reason for delay in delivery.
- c) Drawings submitted for information shall not be approved by tkIS - India. Vendor to note that documents prepared for the purpose of manufacturing shall not be sent to tkIS - India for approval. tkIS - India shall not be responsible for any mistakes/omissions in these documents as well as any delays due to the same. Specifications of instruments ordered shall be strictly as per tkIS - India data sheets which shall also form the basis for inspection.

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0017	Contract No. 66-0215	
	TECHNICAL SPECIFICATIONS – ON-OFF PLUG/BALL VALVES				
				Rev	00

VENDORS LIST

Approved vendors for bought out items are as given below:

- a. Actuator
- b. Valve
- c. Positioner
- d. Limit Switches (Inductive Type) P & F Model Numbers NJ2-V3-N OR SJ3.5-N
(2 wire type)
- e. Solenoid valves ASCO(I) / Rotex / Herion
- f. Air Filter Regulators Placka / Shavo Norgren / Midland
- g. Air lock relay/Booster relay/Check valve. Vendor's std.
- h. Vendors for fabrication of air vessels KINAM Engg. Bombay
GEECY Engg. Corp. Thane
TAS Engg. Thane
VH Engg. Bombay.

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0017	Contract No. 66-0215	
	TECHNICAL SPECIFICATIONS – ON-OFF PLUG/BALL VALVES				
				Rev	00

COMPLIANCE DECLARATION & PTR

Please note that vendor shall indicate his replies to the following points without which the offer shall be liable for rejection.

Deviations, if any, from tkIS-India specifications, shall be listed in the enclosed format (List of Deviations) indicating the applicable specification clause. The vendor will be made liable for full compliance with the specification requirements, if deviations are not listed in 'List of Deviations', as it will be deemed as 'No deviation'.

SR. NO.	DESCRIPTION	EXPECTED REPLY	CONFIRMATION BY VENDOR	REMARKS
1.	Confirm that all deviations against tkIS-India specifications are consolidated under "List of Deviations". Deviations mentioned elsewhere will not be taken into consideration.	No Deviation		
2.	Confirm that a soft copy of the technical bid, as per the attached format, is submitted with the technical offer.	Yes		
3.	Confirm that there is no discrepancy in the technical details outlined in the hard and soft copy of the offer.	No Discrepancy		
4.	Relevant Catalogues / literature giving specifications for all models offered including sizing data is enclosed with the offer.	Yes		
5.	Relevant Catalogues/specifications of all bought out items is enclosed with the offer.	Yes		
6.	Quoted for Spare parts recommended for 2 years continuous trouble-free operation along with listing.	Quoted		
7.	Quoted and offered recommended Commissioning spares along with listing.	Quoted		
8.	Quoted for 'Mandatory spares' if specified in tkIS-India specifications along with listing.	Quoted		
9.	Confirm that PTR form, as per attached format, is submitted with the technical offer in any of the following cases: a) Vendor has not supplied the item to tkIS-India or to projects where tkIS-India is EPCM Contractor. b) Items/ part items not supplied to tkIS-India or to projects where tkIS-India was EPCM contractor. c) tkIS-India Enquiry specifically asks for PTR.	Yes		



(Signature of Vendor)

Name:

Designation :

Date :

(Company Seal)

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0017	Contract No. 66-0215
	TECHNICAL SPECIFICATIONS – ON-OFF PLUG/BALL VALVES			
				Rev 00 Page 15 of 16

LIST OF DEVIATIONS

Sr. No.	Doc. No:		Subject / Description	Deviation
	Clause No.	Page No.		

PIN-OMC-03-F101 08-2017



(Signature of Vendor)

Name:

Designation :

Date :

(Company Seal)

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0017	Contract No. 66-0215	
	TECHNICAL SPECIFICATIONS – ON-OFF PLUG/BALL VALVES				
				Rev	00

PROVEN TRACK RECORD

- I) Vendor to submit the filled PTR form as part of the initial offer itself in the following cases:
- (a) Vendor has not supplied the item to tkIS-India or to projects where tkIS-India was EPCM contractor.
 - (b) The vendor offer contains items / part items not supplied by vendor to tkIS-India or to projects where tkIS-India was EPCM contractor. e.g. accessory like Solenoid valve, limit switch, I/O card, control valve body etc.
 - (c) PTR form is specifically required as per the tkIS-India enquiry specification.
- II) PTR form, when required to be filled in, shall be submitted by vendor as part of the initial offer failing which their offer shall not be processed further.
- III) Vendor to fill the respective clause in the 'Compliance Declaration' form correctly.
- IV) Vendor to submit the PTR details in the format given below. All entries shall be for items which have been commissioned for more than a year. Vendors are required to fill out the contact details of the person (from End customer) from whom feedback regarding operation of item can be taken.


PTR FORM


Sr. No.	Product / Accessory	End Customer	Country	Plant / Project name	Date of Supply	Date of Comm.	End customer contact details			
							Name	Tel No.	Mobile No.	E-mail id
1										
2										
3										
4										
5										


Requisition number:		P. O. number:				
Rev. No.	Item Number	Tag Number		Instrument Type	Page No.	
0	1	XV	-0516AN	- Added	On/Off Valve - Plug	S-1
0	2	XV	-0516BN	- Added	On/Off Valve - Plug	S-2
0	3	XV	-0534N	- Added	On/Off Valve - Plug	S-3
0	4	XV	-0605AN	- Added	On/Off Valve - Plug	S-4
0	5	XV	-0605BN	- Added	On/Off Valve - Plug	S-5
0	6	XV	-0613N	- Added	On/Off Valve - Plug	S-6
0	7	XV	-0614N	- Added	On/Off Valve - Plug	S-7
0	8	XV	-1102AN	- Added	On/Off Valve - Plug	S-8
0	9	XV	-1102BN	- Added	On/Off Valve - Plug	S-9
0	10	XV	-1103AN	- Added	On/Off Valve - Plug	S-10
0	11	XV	-1103BN	- Added	On/Off Valve - Plug	S-11
0	12	XSOV	-0534N	- Added	Solenoid valve	S-12.1
0	13	XSOV	-0516AN	- Added	Solenoid valve	S-12.1
0	14	XSOV	-0516BN	- Added	Solenoid valve	S-12.1
0	15	XSOV	-0613N	- Added	Solenoid valve	S-12.1
0	16	XSOV	-0614N	- Added	Solenoid valve	S-12.1
0	17	XSOV	-0605AN	- Added	Solenoid valve	S-12.1
0	18	XSOV	-0605BN	- Added	Solenoid valve	S-12.1
0	19	XSOV	-1102AN	- Added	Solenoid valve	S-12.1
0	20	XSOV	-1102BN	- Added	Solenoid valve	S-12.1
0	21	XSOV	-1103AN	- Added	Solenoid valve	S-12.1
0	22	XSOV	-1103BN	- Added	Solenoid valve	S-12.1


Domain: PACL_350TPD			Plant: PACL_EXPANSION		
Area: 350 TPD NaOH Plant			Unit: 11-Cell Room		
			Binder Package		
			Formal issue Date: 24-12-2018		
			Instrument Specification List		
			On/Off Valve - Plug		
0	ADE	24-12-2018	For Enquiry		
No.	By	Date	Description		
			Doc. No.: 0215-INS-00-EC-0017		Rev.: 0





Installation area data									
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area		
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.			
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)		
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)			
B55	Max. relative humidity	100 %			B21	Remark (2)			
B57	Altitude above sea level	348 m							
Process data					Location data				
B25	Fluid	Crude Brine			B04	PI-Diagram / Sheet no.	05-05N		
B41	Composition				B80	Reference location	50-BRCR1-05208N-PX55CA		
B42	Corrosive components				B84	Pipe spec. selected	PX55CA		
B43	Toxic components				B97	Connection type	Flanged		
B44	Abrasive components				B14	Line [DN][PN]	50 mm	150#	
B45	Suspended particles				B93	Connection facing	LJ		
B39	Special fluid properties (1)				B92	Line material	FRP,DERAKANE 470-300		
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	50	50	mm
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]			
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]			
B50	Pollution restriction				B70	Design pressure [min.][max.]	9 kgf/cm ² -g		
B48	Inline hazardous area				B72	Design temp. [min.][max.]	80 °C		
B26	Phase	Liquid			B98	Remark (1)			
Run case value					Accessories				
D42	Flow rate				Am ³ /h	G01	Actuator type	Piston (single action), pneum.	
D50	Mass flow rate					G02	Manufacturer		
D51	Actual flow [i.N.]					G03	Manufacturer model no.		
D24	Operating pressure p1		5		kgf/cm ² -a	G04	Allow. air supply [min.][max]	4	6 kgf/cm ²
D27	Operating pressure p2					G05	Stroke time [open][close]	s	
D40	Diff.pressure p1-p2				kgf/cm ²	G06	Bench range/No. of springs		
D30	Operating temperature t1		55		°C	G38	Fail safe position/Handwheel	FC	No
D33	Operating density		1180		kg/m ³	G07	Tubing [material][size]	SS316	8 mm
D45	Flashing				%	G09	Positioner (tag no.)		
D46	Operat. density vapour fraction					G10	Part number		
D82	cv [calc.]					G11	Manufacturer		
D36	Pressure [Boiling-][Critical-]				kgf/cm ² -g	G12	Manufacturer model no.		
D52	Temp. [Boiling-][Condensation-]				°C	G13	Value [closed][open]		
D10	Density at ref. cond.				kg/m ³	G15	Solenoid valve A/B (tag no.)	XSOV -0516AN	
D11	Dynamic viscosity				cP	G14	Part number A/B		
D53	Molecular weight					G19	Manufacturer A/B		
D54	Compr.fact. (Z1/Zn)\sent.exp.					G20	Manufacturer model no. A/B		
D43	Max. allowable pressure drop					G21	Connection size A/B	1/4	NPT(F)
D41	Max. shut-off [p1-p2][p2-p1]				9 kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -0516AN	XZSL -0516AN
D59	Remark (1)				G22	Part number A/B			
D60	Remark (2)				G27	Manufacturer A/B			
Component process design					Additional accessories/Material part no.				
N01	Manufacturer/Model number	*		*		G28	Manufacturer model no. A/B		
N03	Type of construct./Bonnet style	Plug Valve		Standard		G30	Position indication (tag no.)		
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5		G29	Part number		
N43	Compon. conn.[DN][PN]	50 mm	150 #			G32	Manufacturer		
N44	Facing compon. conn.	RF, ASME 16.5				G33	Manufacturer model no.		
BM03	Face to face dim L (mm)					G34	Valve guard system (tag no.)		
N09	Material body/process conn.	Ductile Iron PFA lined				G35	Part number		
N70	Material [bonnet][bellow]	PFA lined				G36	Manufacturer		
N71	Material [seat][plug/disc/ball]	PTFE	PFA lined			G37	Manufacturer model no.		
N68	Trim type					Component process design (continued)			
N72	Treatment seat\plug	PTFE-Soft seat				N81	Air set		
N73	Material [bushing][stem]		SS PFA lined			N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5	
N74	Packing [material][type]	PTFE	Standard packing			N85			
N75	Characteristic	On-Off				N60			
N76	Stroke\angle	90 Deg				N37	Remark(1)		
D63	Leakage requirement	ANSI VI (TSO)				N38	Remark(2)		
N10	Cleaning requirement					Component process design (continued)			
R83	Cvs [select.] \ Seat diam.					N11	SIL Class		
N78	Flow direction					N12	Remark(1)		
N67	Calc sound press. level max	<= 85		dB(A)		N13	Remark(2)		
TAG Identific. XV -0516AN					Part no. MCA0002		Inst. Type: On/Off Valve - Plug		
		0	24-12-2018	Instrument Data Sheet			UAN / Code PACL_350TPD 660215 Plant PACL_EXPANSION		
R		Date	Client Doc ID:						
Doc. ID-Code: XV -0516AN-SP		CC:	UA:	Form No: 1		Page S-1 / 13			


Installation area data									
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area		
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.			
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)		
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)			
B55	Max. relative humidity	100 %			B21	Remark (2)			
B57	Altitude above sea level	348 m							
Process data					Location data				
B25	Fluid	Crude Brine			B04	PI-Diagram / Sheet no.	05-05N		
B41	Composition				B80	Reference location	50-BRCR1-05209N-PX55CA		
B42	Corrosive components				B84	Pipe spec. selected	PX55CA		
B43	Toxic components				B97	Connection type	Flanged		
B44	Abrasive components				B14	Line [DN][PN]	50 mm	150#	
B45	Suspended particles				B93	Connection facing	LJ		
B39	Special fluid properties (1)				B92	Line material	FRP,DERAKANE 470-300		
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	50	50	mm
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]			
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]			
B50	Pollution restriction				B70	Design pressure [min.][max.]	9 kgf/cm ² -g		
B48	Inline hazardous area				B72	Design temp. [min.][max.]	80 °C		
B26	Phase	Liquid			B98	Remark (1)			
Run case value					Accessories				
D42	Flow rate				Am ³ /h	G01	Actuator type	Piston (single action), pneum.	
D50	Mass flow rate					G02	Manufacturer		
D51	Actual flow [i.N.]					G03	Manufacturer model no.		
D24	Operating pressure p1		5		kgf/cm ² -g	G04	Allow. air supply [min.][max]	4	6 kgf/cm ²
D27	Operating pressure p2					G05	Stroke time [open][close]	s	
D40	Diff.pressure p1-p2				kgf/cm ²	G06	Bench range/No. of springs		
D30	Operating temperature t1		55		°C	G38	Fail safe position/Handwheel	FC	No
D33	Operating density		1180		kg/m ³	G07	Tubing [material][size]	SS316	8 mm
D45	Flashing				%	G09	Positioner (tag no.)		
D46	Operat. density vapour fraction					G10	Part number		
D82	cv [calc.]					G11	Manufacturer		
D36	Pressure [Boiling-][Critical-]				kgf/cm ² -g	G12	Manufacturer model no.		
D52	Temp. [Boiling-][Condensation-]				°C	G13	Value [closed][open]		
D10	Density at ref. cond.				kg/m ³	G15	Solenoid valve A/B (tag no.)	XSOV -0516BN	
D11	Dynamic viscosity				cP	G14	Part number A/B		
D53	Molecular weight					G19	Manufacturer A/B		
D54	Compr.fact. (Z1/Zn)\sent.exp.					G20	Manufacturer model no. A/B		
D43	Max. allowable pressure drop					G21	Connection size A/B	1/4"	NPT(F)
D41	Max. shut-off [p1-p2][p2-p1]				9 kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -0516BN	XZSL -0516BN
D59	Remark (1)				G22	Part number A/B			
D60	Remark (2)				G27	Manufacturer A/B			
Component process design					Additional accessories/Material part no.				
N01	Manufacturer/Model number	*		*		G28	Manufacturer model no. A/B		
N03	Type of construct./Bonnet style	Plug Valve		Standard		G30	Position indication (tag no.)		
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5		G29	Part number		
N43	Compon. conn.[DN][PN]	50 mm	150#			G32	Manufacturer		
N44	Facing compon. conn.	RF, ASME 16.5				G33	Manufacturer model no.		
N03	Face to face dim L (mm)					G34	Valve guard system (tag no.)		
N09	Material body/process conn.	Ductile Iron PFA lined				G35	Part number		
N70	Material [bonnet][bellow]	PFA lined				G36	Manufacturer		
N71	Material [seat][plug/disc/ball]	PTFE	PFA lined			G37	Manufacturer model no.		
N68	Trim type					Component process design (continued)			
N72	Treatment seat\plug	PTFE-Soft seat				N81	Air set		
N73	Material [bushing][stem]		SS PFA lined			N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5	
N74	Packing [material][type]	PTFE	Standard packing			N85			
N75	Characteristic	On-Off				N60			
N76	Stroke\angle	90 Deg				N37	Remark(1)		
D63	Leakage requirement	ANSI VI (TSO)				N38	Remark(2)		
N10	Cleaning requirement					Component process design (continued)			
R83	Cvs [select.] \ Seat diam.					N11	SIL Class		
N78	Flow direction					N12	Remark(1)		
N67	Calc sound press. level max	<= 85		dB(A)		N13	Remark(2)		
TAG Identific. XV -0516BN					Part no. MCA0002		Inst. Type: On/Off Valve - Plug		
		0	24-12-2018	Instrument Data Sheet			UAN / Code PACL_350TPD 660215 Plant PACL_EXPANSION		
R		Date	Client Doc ID:						
Doc. ID-Code: XV -0516BN-SP		CC:	UA:	Form No: 1		Page S-2 / 13			


Installation area data									
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area		
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.			
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)		
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)			
B55	Max. relative humidity	100 %			B21	Remark (2)			
B57	Altitude above sea level	348 m							
Process data					Location data				
B25	Fluid	Plant Air			B04	PI-Diagram / Sheet no.	05-06N		
B41	Composition				B80	Reference location	100-AIP1-05211N-PX55CA		
B42	Corrosive components				B84	Pipe spec. selected	PX55CA		
B43	Toxic components				B97	Connection type	Flanged		
B44	Abrasive components				B14	Line [DN][PN]	100 mm	150#	
B45	Suspended particles				B93	Connection facing	LJ		
B39	Special fluid properties (1)				B92	Line material	FRP,DERAKANE 470-300		
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	100.4	115	mm
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]			
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]			
B50	Pollution restriction				B70	Design pressure [min.][max.]	6 kgf/cm ² -g		
B48	Inline hazardous area				B72	Design temp. [min.][max.]	80 °C		
B26	Phase	Gas/Vapor			B98	Remark (1)	Adjacent Line Size: 50mm		
					B99	Remark (2)			
Run case value					Accessories				
D42	Flow rate				Am ³ /h	G01	Actuator type	Piston (single action), pneum.	
D50	Mass flow rate					G02	Manufacturer		
D51	Actual flow [i.N.]					G03	Manufacturer model no.		
D24	Operating pressure p1		3	5	kgf/cm ² -g	G04	Allow. air supply [min.][max]	4	6 kgf/cm ²
D27	Operating pressure p2					G05	Stroke time [open][close]	s	
D40	Diff.pressure p1-p2				kgf/cm ²	G06	Bench range/No. of springs		
D30	Operating temperature t1		40		°C	G38	Fail safe position/Handwheel	FO	No
D33	Operating density				kg/m ³	G07	Tubing [material][size]	SS316	8 mm
D45	Flashing				%	G09	Positioner (tag no.)		
D46	Operat. density vapour fraction					G10	Part number		
D82	cv [calc.]					G11	Manufacturer		
D36	Pressure [Boiling-][Critical-]				kgf/cm ² -g	G12	Manufacturer model no.		
D52	Temp. [Boiling-][Condensation-]				°C	G13	Value [closed][open]		
D10	Density at ref. cond.			1.288	kg/m ³	G15	Solenoid valve A/B (tag no.)	XSOV -0534N	
D11	Dynamic viscosity				cP	G14	Part number A/B		
D53	Molecular weight					G19	Manufacturer A/B		
D54	Compr.fact. (Z1/Zn)\sent.exp.					G20	Manufacturer model no. A/B		
D43	Max. allowable pressure drop					G21	Connection size A/B	1/4"	NPT(F)
D41	Max. shut-off [p1-p2][p2-p1]			6	kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -0534N	XZSL -0534N
D59	Remark (1)				G22	Part number A/B			
D60	Remark (2)				G27	Manufacturer A/B			
Component process design					Additional accessories/Material part no.				
N01	Manufacturer/Model number	*		*		G28	Manufacturer model no. A/B		
N03	Type of construct./Bonnet style	Plug Valve		Standard		G30	Position indication (tag no.)		
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5		G29	Part number		
N43	Compon. conn.[DN][PN]	50 mm	150#			G32	Manufacturer		
N44	Facing compon. conn.	RF, ASME 16.5				G33	Manufacturer model no.		
N03	Face to face dim L (mm)					G34	Valve guard system (tag no.)		
N09	Material body/process conn.	Ductile Iron PFA lined				G35	Part number		
N70	Material [bonnet][bellow]	PFA lined				G36	Manufacturer		
N71	Material [seat][plug/disc/ball]	PTFE	PFA lined			G37	Manufacturer model no.		
N68	Trim type					Component process design (continued)			
N72	Treatment seat\plug	PTFE-Soft seat				N81	Air set		
N73	Material [bushing][stem]		SS PFA lined			N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5	
N74	Packing [material][type]	PTFE	Standard packing			N85			
N75	Characteristic	On-Off				N60			
N76	Stroke\angle	90 Deg				N37	Remark(1)		
D63	Leakage requirement	ANSI VI (TSO)				N38	Remark(2)		
N10	Cleaning requirement					Component process design (continued)			
R83	Cvs [select.] \ Seat diam.					N11	SIL Class		
N78	Flow direction					N12	Remark(1)		
N67	Calc sound press. level max	<= 85		dB(A)		N13	Remark(2)		
TAG Identific. XV -0534N					Part no. MCA0002		Inst. Type: On/Off Valve - Plug		
		0	24-12-2018	Instrument Data Sheet			UAN / Code PACL_350TPD 660215 Plant PACL_EXPANSION		
		R	Date	Client Doc ID:					
Doc. ID-Code: XV -0534N-SP		CC:	UA:	Form No: 1		Page S-3 / 13			


Installation area data									
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area		
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.			
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)		
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)			
B55	Max. relative humidity	100 %			B21	Remark (2)			
B57	Altitude above sea level	348 m							
Process data					Location data				
B25	Fluid	Brine Solution			B04	PI-Diagram / Sheet no.	06-01N		
B41	Composition				B80	Reference location	250-BRP-06008N-PL55D		
B42	Corrosive components				B84	Pipe spec. selected	PL55D		
B43	Toxic components				B97	Connection type	Flanged		
B44	Abrasive components				B14	Line [DN][PN]	250 mm	150#	
B45	Suspended particles				B93	Connection facing	LJ		
B39	Special fluid properties (1)				B92	Line material	FRP-PP-R LIN, DERAKANE 470-300		
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	250.2	259	mm
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]			
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]			
B50	Pollution restriction				B70	Design pressure [min.][max.]	9 kgf/cm ² -g		
B48	Inline hazardous area				B72	Design temp. [min.][max.]	90 °C		
B26	Phase	Liquid			B98	Remark (1)	Adjustedt Line Size: 25mm		
					B99	Remark (2)			
Runcase value				min.	norm.	max.	unit		
D42	Flow rate					Am ³ /h			
D50	Mass flow rate								
D51	Actual flow [i.N.]								
D24	Operating pressure p1					kgf/cm ² -g			
D27	Operating pressure p2								
D40	Diff.pressure p1-p2					kgf/cm ²			
D30	Operating temperature t1		63			°C			
D33	Operating density		1180			kg/m ³			
D45	Flashing					%			
D46	Operat. density vapour fraction								
D82	cv [calc.]								
D36	Pressure [Boiling-][Critical-]					kgf/cm ² -g			
D52	Temp. [Boiling-][Condensation-]					°C			
D10	Density at ref. cond.					kg/m ³			
D11	Dynamic viscosity					cP			
D53	Molecular weight								
D54	Compr.fact. (Z1/Zn)\sent.exp.								
D43	Max. allowable pressure drop								
D41	Max. shut-off [p1-p2][p2-p1]					9 kgf/cm ²			
D59	Remark (1)								
D60	Remark (2)								
Component process design									
N01	Manufacturer/Model number	*		*					
N03	Type of construct./Bonnet style	Plug Valve		Standard					
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5					
N43	Compon. conn.[DN][PN]	25 mm	150 #						
N44	Facing compon. conn.	RF, ASME 16.5							
N03	Face to face dim L (mm)								
N09	Material body/process conn.	Ductile Iron PFA lined							
N70	Material [bonnet][bellow]	PFA lined							
N71	Material [seat][plug/disc/ball]	PTFE	PFA lined						
N68	Trim type								
N72	Treatment seat\plug	PTFE-Soft seat							
N73	Material [bushing][stem]		SS PFA lined						
N74	Packing [material][type]	PTFE	Standard packing						
N75	Characteristic	On-Off							
N76	Stroke\angle	90 Deg							
D63	Leakage requirement	ANSI VI (TSO)							
N10	Cleaning requirement								
R83	Cvs [select.] \ Seat diam.								
N78	Flow direction								
N67	Calc sound press. level max	<= 85				dB(A)			
Additional accessories/Material part no.									
N81	Air set								
N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5							
N85									
N60									
N37	Remark(1)								
N38	Remark(2)								
Component process design (continued)									
N11	SIL Class								
N12	Remark(1)								
N13	Remark(2)								
TAG Identific. XV -0605AN Part no. MCA0002 Inst. Type: On/Off Valve - Plug									
		0	24-12-2018	Instrument Data Sheet			UAN / Code PACL_350TPD 660215		
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Installation area data										
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area			
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.				
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)			
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)				
B55	Max. relative humidity	100 %			B21	Remark (2)				
B57	Altitude above sea level	348 m								
Process data					Location data					
B25	Fluid	Brine Solution			B04	PI-Diagram / Sheet no.	06-01N			
B41	Composition				B80	Reference location	250-BRP-06022N-PL55D			
B42	Corrosive components				B84	Pipe spec. selected	PL55D			
B43	Toxic components				B97	Connection type	Flanged			
B44	Abrasive components				B14	Line [DN][PN]	250 mm		150#	
B45	Suspended particles				B93	Connection facing	LJ			
B39	Special fluid properties (1)				B92	Line material	FRP-PP-R LIN, DERAKANE 470-300			
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	250.2	259	mm	
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]				
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]				
B50	Pollution restriction				B70	Design pressure [min.][max.]	9 kgf/cm ² -g			
B48	Inline hazardous area				B72	Design temp. [min.][max.]	90 °C			
B26	Phase	Liquid			B98	Remark (1)	Adjustedt Line Size: 25mm			
					B99	Remark (2)				
Runcase value					Accessories					
D42	Flow rate				Am ³ /h	G01	Actuator type	Piston (single action), pneum.		
D50	Mass flow rate					G02	Manufacturer			
D51	Actual flow [i.N.]					G03	Manufacturer model no.			
D24	Operating pressure p1				kgf/cm ² -g	G04	Allow. air supply [min.][max]	4	6	kgf/cm ²
D27	Operating pressure p2					G05	Stroke time [open][close]			s
D40	Diff.pressure p1-p2				kgf/cm ²	G06	Bench range/No. of springs			
D30	Operating temperature t1		63		°C	G38	Fail safe position/Handwheel	FO	No	
D33	Operating density		1180		kg/m ³	G07	Tubing [material][size]	SS316		8 mm
D45	Flashing				%	G09	Positioner (tag no.)			
D46	Operat. density vapour fraction					G10	Part number			
D82	cv [calc.]					G11	Manufacturer			
D36	Pressure [Boiling-][Critical-]				kgf/cm ² -g	G12	Manufacturer model no.			
D52	Temp. [Boiling-][Condensation-]				°C	G13	Value [closed][open]			
D10	Density at ref. cond.				kg/m ³	G15	Solenoid valve A/B (tag no.)	XSOV -0605BN		
D11	Dynamic viscosity				cP	G14	Part number A/B			
D53	Molecular weight					G19	Manufacturer A/B			
D54	Compr.fact. (Z1/Zn)\sent.exp.					G20	Manufacturer model no. A/B			
D43	Max. allowable pressure drop					G21	Connection size A/B	1/4"	NPT(F)	
D41	Max. shut-off [p1-p2][p2-p1]				9 kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -0605BN	XZSL -0605BN	
D59	Remark (1)				G22	Part number A/B				
D60	Remark (2)				G27	Manufacturer A/B				
Component process design					Component process design (continued)					
N01	Manufacturer/Model number	*		*		G28	Manufacturer model no. A/B			
N03	Type of construct./Bonnet style	Plug Valve		Standard		G30	Position indication (tag no.)			
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5		G29	Part number			
N43	Compon. conn.[DN][PN]	25 mm	150#			G32	Manufacturer			
N44	Facing compon. conn.	RF, ASME 16.5				G33	Manufacturer model no.			
N03	Face to face dim L (mm)					G34	Valve guard system (tag no.)			
N09	Material body/process conn.	Ductile Iron PFA lined				G35	Part number			
N70	Material [bonnet][bellow]	PFA lined				G36	Manufacturer			
N71	Material [seat][plug/disc/ball]	PTFE	PFA lined			G37	Manufacturer model no.			
N68	Trim type					Additional accessories/Material part no.				
N72	Treatment seat\plug	PTFE-Soft seat				N81	Air set			
N73	Material [bushing][stem]		SS PFA lined			N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5		
N74	Packing [material][type]	PTFE	Standard packing			N85				
N75	Characteristic	On-Off				N60				
N76	Stroke\angle	90 Deg				N37	Remark(1)			
D63	Leakage requirement	ANSI VI (TSO)				N38	Remark(2)			
N10	Cleaning requirement					Component process design (continued)				
R83	Cvs [select.] \ Seat diam.					N11	SIL Class			
N78	Flow direction					N12	Remark(1)			
N67	Calc sound press. level max	<= 85			dB(A)	N13	Remark(2)			
TAG Identific. XV -0605BN					Part no. MCA0002		Inst. Type: On/Off Valve - Plug			
		0	24-12-2018	Instrument Data Sheet			UAN / Code		PACL_350TPD 660215	
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Installation area data									
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area		
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.			
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)		
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)			
B55	Max. relative humidity	100 %			B21	Remark (2)			
B57	Altitude above sea level	348 m							
Process data					Location data				
B25	Fluid	32% Caustic Solution			B04	PI-Diagram / Sheet no.	06-09		
B41	Composition				B80	Reference location	50-CSM2-31004N-EG55C		
B42	Corrosive components				B84	Pipe spec. selected	EG55C		
B43	Toxic components				B97	Connection type	Flanged		
B44	Abrasive components				B14	Line [DN][PN]	50 mm	150#	
B45	Suspended particles				B93	Connection facing	LJ		
B39	Special fluid properties (1)				B92	Line material	A 312 TP316L		
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	54.8	60.3	mm
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]			
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]			
B50	Pollution restriction				B70	Design pressure [min.][max.]	8 kgf/cm ² -g		
B48	Inline hazardous area				B72	Design temp. [min.][max.]	95 °C		
B26	Phase	Liquid			B98	Remark (1)			
Run case value					Accessories				
D42	Flow rate				Am ³ /h	G01	Actuator type	Piston (single action), pneum.	
D50	Mass flow rate					G02	Manufacturer		
D51	Actual flow [i.N.]					G03	Manufacturer model no.		
D24	Operating pressure p1				kgf/cm ² -g	G04	Allow. air supply [min.][max]	4	6 kgf/cm ²
D27	Operating pressure p2					G05	Stroke time [open][close]	s	
D40	Diff.pressure p1-p2				kgf/cm ²	G06	Bench range/No. of springs		
D30	Operating temperature t1		40		°C	G38	Fail safe position/Handwheel	FC	No
D33	Operating density		1336		kg/m ³	G07	Tubing [material][size]	SS316	8 mm
D45	Flashing				%	G09	Positioner (tag no.)		
D46	Operat. density vapour fraction					G10	Part number		
D82	cv [calc.]					G11	Manufacturer		
D36	Pressure [Boiling-][Critical-]				kgf/cm ² -g	G12	Manufacturer model no.		
D52	Temp. [Boiling-][Condensation-]				°C	G13	Value [closed][open]		
D10	Density at ref. cond.				kg/m ³	G15	Solenoid valve A/B (tag no.)	XSOV -0613N	
D11	Dynamic viscosity				7 cP	G14	Part number A/B		
D53	Molecular weight					G19	Manufacturer A/B		
D54	Compr.fact. (Z1/Zn)\sent.exp.					G20	Manufacturer model no. A/B		
D43	Max. allowable pressure drop					G21	Connection size A/B	1/4"	NPT(F)
D41	Max. shut-off [p1-p2][p2-p1]				8 kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -0613N	XZSL -0613N
D59	Remark (1)				G22	Part number A/B			
D60	Remark (2)				G27	Manufacturer A/B			
Component process design					Component process design (continued)				
N01	Manufacturer/Model number	*		*		G28	Manufacturer model no. A/B		
N03	Type of construct./Bonnet style	Plug Valve		Standard		G30	Position indication (tag no.)		
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5		G29	Part number		
N43	Compon. conn.[DN][PN]	50 mm	150 #			G32	Manufacturer		
N44	Facing compon. conn.	RF, ASME 16.5				G33	Manufacturer model no.		
N03	Face to face dim L (mm)					G34	Valve guard system (tag no.)		
N09	Material body/process conn.	A351 Gr.CF8M				G35	Part number		
N70	Material [bonnet][bellow]	A351 Gr.CF8M				G36	Manufacturer		
N71	Material [seat][plug/disc/ball]	PTFE	316SS			G37	Manufacturer model no.		
N68	Trim type					Additional accessories/Material part no.			
N72	Treatment seat\plug	PTFE-Soft seat				N81	Air set		
N73	Material [bushing][stem]		SS 316			N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5	
N74	Packing [material][type]	PTFE	Standard packing			N85			
N75	Characteristic	On-Off				N60			
N76	Stroke\angle	90 Deg				N37	Remark(1)		
D63	Leakage requirement	ANSI VI (TSO)				N38	Remark(2)		
N10	Cleaning requirement					Component process design (continued)			
R83	Cvs [select.] \ Seat diam.					N11	SIL Class		
N78	Flow direction					N12	Remark(1)		
N67	Calc sound press. level max	<= 85		dB(A)		N13	Remark(2)		
TAG Identific. XV -0613N		Part no. MCA0002		Inst. Type: On/Off Valve - Plug					
		0	24-12-2018	Instrument Data Sheet		UAN / Code		PACL_350TPD 660215	
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Installation area data									
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area		
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.			
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)		
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)			
B55	Max. relative humidity	100 %			B21	Remark (2)			
B57	Altitude above sea level	348 m							
Process data					Location data				
B25	Fluid	32 % Caustic Solution			B04	PI-Diagram / Sheet no.	06-09		
B41	Composition				B80	Reference location	50-CSM2-06030N-EG55C-H30		
B42	Corrosive components				B84	Pipe spec. selected	EG55C		
B43	Toxic components				B97	Connection type	Flanged		
B44	Abrasive components				B14	Line [DN][PN]	50 mm	150#	
B45	Suspended particles				B93	Connection facing	LJ		
B39	Special fluid properties (1)				B92	Line material	A 312 TP316L		
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	54.8	60.3	mm
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]			
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]			
B50	Pollution restriction				B70	Design pressure [min.][max.]	8 kgf/cm ² -g		
B48	Inline hazardous area				B72	Design temp. [min.][max.]	95 °C		
B26	Phase	Liquid			B98	Remark (1)			
					B99	Remark (2)			
Run case value					Accessories				
D42	Flow rate				Am ³ /h	G01	Actuator type	Piston (single action), pneum.	
D50	Mass flow rate					G02	Manufacturer		
D51	Actual flow [i.N.]					G03	Manufacturer model no.		
D24	Operating pressure p1				kgf/cm ² -g	G04	Allow. air supply [min.][max]	4	6 kgf/cm ²
D27	Operating pressure p2					G05	Stroke time [open][close]	s	
D40	Diff.pressure p1-p2				kgf/cm ²	G06	Bench range/No. of springs		
D30	Operating temperature t1		40		°C	G38	Fail safe position/Handwheel	FC	No
D33	Operating density		1336		kg/m ³	G07	Tubing [material][size]	SS316	8 mm
D45	Flashing				%	G09	Positioner (tag no.)		
D46	Operat. density vapour fraction					G10	Part number		
D82	cv [calc.]					G11	Manufacturer		
D36	Pressure [Boiling-][Critical-]				kgf/cm ² -g	G12	Manufacturer model no.		
D52	Temp. [Boiling-][Condensation-]				°C	G13	Value [closed][open]		
D10	Density at ref. cond.				kg/m ³	G15	Solenoid valve A/B (tag no.)	XSOV -0614N	
D11	Dynamic viscosity				7 cP	G14	Part number A/B		
D53	Molecular weight					G19	Manufacturer A/B		
D54	Compr.fact. (Z1/Zn)\sent.exp.					G20	Manufacturer model no. A/B		
D43	Max. allowable pressure drop					G21	Connection size A/B	1/4"	NPT(F)
D41	Max. shut-off [p1-p2][p2-p1]				8 kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -0614N	XZSL -0614N
D59	Remark (1)				G22	Part number A/B			
D60	Remark (2)				G27	Manufacturer A/B			
Component process design					Component process design (continued)				
N01	Manufacturer/Model number	*		*		G28	Manufacturer model no. A/B		
N03	Type of construct./Bonnet style	Plug Valve		Standard		G30	Position indication (tag no.)		
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5		G29	Part number		
N43	Compon. conn.[DN][PN]	50 mm	150#			G32	Manufacturer		
N44	Facing compon. conn.	RF, ASME 16.5				G33	Manufacturer model no.		
N03	Face to face dim L (mm)					G34	Valve guard system (tag no.)		
N09	Material body/process conn.	A351 Gr.CF8M				G35	Part number		
N70	Material [bonnet][bellow]	A351 Gr.CF8M				G36	Manufacturer		
N71	Material [seat][plug/disc/ball]	PTFE	316SS			G37	Manufacturer model no.		
N68	Trim type					Additional accessories/Material part no.			
N72	Treatment seat\plug	PTFE-Soft seat				N81	Air set		
N73	Material [bushing][stem]		SS316			N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5	
N74	Packing [material][type]	PTFE	Standard packing			N85			
N75	Characteristic	On-Off				N60			
N76	Stroke\angle	90 Deg				N37	Remark(1)		
D63	Leakage requirement	ANSI VI (TSO)				N38	Remark(2)		
N10	Cleaning requirement					Component process design (continued)			
R83	Cvs [select.] \ Seat diam.					N11	SIL Class		
N78	Flow direction					N12	Remark(1)		
N67	Calc sound press. level max	<= 85		dB(A)		N13	Remark(2)		
TAG Identific. XV -0614N					Part no. MCA0002		Inst. Type: On/Off Valve - Plug		
		0	24-12-2018	Instrument Data Sheet			UAN / Code PACL_350TPD 660215 Plant PACL_EXPANSION		
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Installation area data										
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area			
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.				
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)			
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)				
B55	Max. relative humidity	100 %			B21	Remark (2)				
B57	Altitude above sea level	348 m								
Process data					Location data					
B25	Fluid	Nitrogen Gas			B04	PI-Diagram / Sheet no.	11-14			
B41	Composition				B80	Reference location	0-BRC1-11A01ANZ05.P1-PW55CB			
B42	Corrosive components				B84	Pipe spec. selected	PW55CB			
B43	Toxic components				B97	Connection type	Flanged			
B44	Abrasive components				B14	Line [DN][PN]	150#			
B45	Suspended particles				B93	Connection facing	LJ			
B39	Special fluid properties (1)				B92	Line material	FRP-HT,DERAKANE 470-300			
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	mm			
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]				
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]				
B50	Pollution restriction				B70	Design pressure [min.][max.]	10 kgf/cm ² -g			
B48	Inline hazardous area				B72	Design temp. [min.][max.]	95 °C			
B26	Phase	Gas/Vapor			B98	Remark (1)	Adjusted Line Size : 25mm			
					B99	Remark (2)				
Run case value				Accessories						
D42	Flow rate	min.	norm.	max.	unit	G01	Actuator type	Piston (single action), pneum.		
D50	Mass flow rate					G02	Manufacturer			
D51	Actual flow [i.N.]					G03	Manufacturer model no.			
D24	Operating pressure p1				kgf/cm ² -g	G04	Allow. air supply [min.][max]	4	6	kgf/cm ²
D27	Operating pressure p2					G05	Stroke time [open][close]			s
D40	Diff.pressure p1-p2				kgf/cm ²	G06	Bench range/No. of springs			
D30	Operating temperature t1		40		°C	G38	Fail safe position/Handwheel	FO	No	
D33	Operating density				kg/m ³	G07	Tubing [material][size]	SS316	8	mm
D45	Flashing				%	G09	Positioner (tag no.)			
D46	Operat. density vapour fraction					G10	Part number			
D82	cv [calc.]					G11	Manufacturer			
D36	Pressure [Boiling-][Critical-]				kgf/cm ² -g	G12	Manufacturer model no.			
D52	Temp. [Boiling-][Condensation-]				°C	G13	Value [closed][open]			
D10	Density at ref. cond.				kg/m ³	G15	Solenoid valve A/B (tag no.)	XSOV -1102AN		
D11	Dynamic viscosity			0.0166	cP	G14	Part number A/B			
D53	Molecular weight					G19	Manufacturer A/B			
D54	Compr.fact. (Z1/Zn)\sent.exp.					G20	Manufacturer model no. A/B			
D43	Max. allowable pressure drop					G21	Connection size A/B	1/4"	NPT(F)	
D41	Max. shut-off [p1-p2][p2-p1]			10	kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -1102AN	XZSL -1102AN	
D59	Remark (1)				G22	Part number A/B				
D60	Remark (2)				G27	Manufacturer A/B				
Component process design										
N01	Manufacturer/Model number	*		*		G28	Manufacturer model no. A/B			
N03	Type of construct./Bonnet style	Plug Valve		Standard		G30	Position indication (tag no.)			
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5		G29	Part number			
N43	Compon. conn.[DN][PN]	25	mm	150#		G32	Manufacturer			
N44	Facing compon. conn.	RF, ASME 16.5				G33	Manufacturer model no.			
N03	Face to face dim L (mm)					G34	Valve guard system (tag no.)			
N09	Material body/process conn.	Ductile Iron PFA lined				G35	Part number			
N70	Material [bonnet][bellow]	PFA lined				G36	Manufacturer			
N71	Material [seat][plug/disc/ball]	PTFE		PFA lined		G37	Manufacturer model no.			
N68	Trim type					Additional accessories/Material part no.				
N72	Treatment seat\plug	PTFE-Soft seat				N81	Air set			
N73	Material [bushing][stem]			SS PFA lined		N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5		
N74	Packing [material][type]	PTFE		Standard packing		N85				
N75	Characteristic	On-Off				N60				
N76	Stroke\angle	90 Deg				N37	Remark(1)			
D63	Leakage requirement	ANSI VI (TSO)				N38	Remark(2)			
N10	Cleaning requirement					Component process design (continued)				
R83	Cvs [select.] \ Seat diam.					N11	SIL Class			
N78	Flow direction					N12	Remark(1)			
N67	Calc sound press. level max	<= 85			dB(A)	N13	Remark(2)			
TAG Identific. XV -1102AN Part no. MDA0002 Inst. Type: On/Off Valve - Plug										
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Installation area data										
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area			
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.				
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)			
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)				
B55	Max. relative humidity	100 %			B21	Remark (2)				
B57	Altitude above sea level	348 m								
Process data					Location data					
B25	Fluid	Nitrogen Gas			B04	PI-Diagram / Sheet no.	11-14			
B41	Composition				B80	Reference location	0-BRC1-11A01BNZ05.P1-PW55CB			
B42	Corrosive components				B84	Pipe spec. selected	PW55CB			
B43	Toxic components				B97	Connection type	Flanged			
B44	Abrasive components				B14	Line [DN][PN]	150#			
B45	Suspended particles				B93	Connection facing	LJ			
B39	Special fluid properties (1)				B92	Line material	FRP-HT,DERAKANE 470-300			
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]	mm			
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]				
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]				
B50	Pollution restriction				B70	Design pressure [min.][max.]	10 kgf/cm ² -g			
B48	Inline hazardous area				B72	Design temp. [min.][max.]	95 °C			
B26	Phase	Gas/Vapor			B98	Remark (1)	Adjusted Line Size : 25mm			
					B99	Remark (2)				
Runcase value				min.	norm.	max.	unit	Accessories		
D42	Flow rate						Am ³ /h	G01	Actuator type	Piston (single action), pneum.
D50	Mass flow rate							G02	Manufacturer	
D51	Actual flow [i.N.]							G03	Manufacturer model no.	
D24	Operating pressure p1						kgf/cm ² -g	G04	Allow. air supply [min.][max]	4 6 kgf/cm ²
D27	Operating pressure p2							G05	Stroke time [open][close]	s
D40	Diff.pressure p1-p2						kgf/cm ²	G06	Bench range/No. of springs	
D30	Operating temperature t1		40				°C	G38	Fail safe position/Handwheel	FO No
D33	Operating density						kg/m ³	G07	Tubing [material][size]	SS316 8 mm
D45	Flashing						%	G09	Positioner (tag no.)	
D46	Operat. density vapour fraction							G10	Part number	
D82	cv [calc.]							G11	Manufacturer	
D36	Pressure [Boiling-][Critical-]						kgf/cm ² -g	G12	Manufacturer model no.	
D52	Temp. [Boiling-][Condensation-]						°C	G13	Value [closed][open]	
D10	Density at ref. cond.						kg/m ³	G15	Solenoid valve A\B (tag no.)	XSOV -1102BN
D11	Dynamic viscosity						0.0166 cP	G14	Part number A\B	
D53	Molecular weight							G19	Manufacturer A\B	
D54	Compr.fact. (Z1/Zn)\sent.exp.							G20	Manufacturer model no. A\B	
D43	Max. allowable pressure drop							G21	Connection size A\B	1/4" NPT(F)
D41	Max. shut-off [p1-p2][p2-p1]						10 kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -1102BN XZSL -1102BN
D59	Remark (1)				G22	Part number A\B				
D60	Remark (2)				G27	Manufacturer A\B				
Component process design										
N01	Manufacturer/Model number	*		*				G28	Manufacturer model no. A\B	
N03	Type of construct./Bonnet style	Plug Valve		Standard				G30	Position indication (tag no.)	
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5				G29	Part number	
N43	Compon. conn.[DN][PN]	25 mm	150#					G32	Manufacturer	
N44	Facing compon. conn.	RF, ASME 16.5						G33	Manufacturer model no.	
N03	Face to face dim L (mm)							G34	Valve guard system (tag no.)	
N09	Material body/process conn.	Ductile Iron PFA lined						G35	Part number	
N70	Material [bonnet][bellow]	PFA lined						G36	Manufacturer	
N71	Material [seat][plug/disc/ball]	PTFE	PFA lined					G37	Manufacturer model no.	
N68	Trim type							Additional accessories/Material part no.		
N72	Treatment seat\plug	PTFE-Soft seat						N81	Air set	
N73	Material [bushing][stem]		SS PFA lined					N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5
N74	Packing [material][type]	PTFE	Standard packing					N85		
N75	Characteristic	On-Off						N60		
N76	Stroke\angle	90 Deg						N37	Remark(1)	
D63	Leakage requirement	ANSI VI (TSO)						N38	Remark(2)	
N10	Cleaning requirement							Component process design (continued)		
R83	Cvs [select.] \ Seat diam.							N11	SIL Class	
N78	Flow direction							N12	Remark(1)	
N67	Calc sound press. level max	<= 85					dB(A)	N13	Remark(2)	
TAG Identific. XV -1102BN Part no. MDA0002 Inst. Type: On/Off Valve - Plug										
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Installation area data										
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area			
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.				
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)			
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)				
B55	Max. relative humidity	100 %			B21	Remark (2)				
B57	Altitude above sea level	348 m								
Process data					Location data					
B25	Fluid	Nitrogen Gas			B04	PI-Diagram / Sheet no.	11-14			
B41	Composition				B80	Reference location	0-BRC1-11A01ANZ04.P1-PL55C			
B42	Corrosive components				B84	Pipe spec. selected	PL55C			
B43	Toxic components				B97	Connection type				
B44	Abrasive components				B14	Line [DN][PN]				
B45	Suspended particles				B93	Connection facing				
B39	Special fluid properties (1)				B92	Line material	FRP-PP-R LIN, DERAKANE 470-300			
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]				
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]				
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]				
B50	Pollution restriction				B70	Design pressure [min.][max.]	10 kgf/cm ² -g			
B48	Inline hazardous area				B72	Design temp. [min.][max.]	95 °C			
B26	Phase	Gas/Vapor			B98	Remark (1)	AdJusted Line Size: 25mm			
					B99	Remark (2)				
Runcase value				min.	norm.	max.	unit	Accessories		
D42	Flow rate						Am ³ /h	G01	Actuator type	Piston (single action), pneum.
D50	Mass flow rate							G02	Manufacturer	
D51	Actual flow [i.N.]							G03	Manufacturer model no.	
D24	Operating pressure p1						kgf/cm ² -g	G04	Allow. air supply [min.][max]	4 6 kgf/cm ²
D27	Operating pressure p2							G05	Stroke time [open][close]	s
D40	Diff.pressure p1-p2						kgf/cm ²	G06	Bench range/No. of springs	
D30	Operating temperature t1		40				°C	G38	Fail safe position/Handwheel	FO No
D33	Operating density						kg/m ³	G07	Tubing [material][size]	SS316 8 mm
D45	Flashing						%	G09	Positioner (tag no.)	
D46	Operat. density vapour fraction							G10	Part number	
D82	cv [calc.]							G11	Manufacturer	
D36	Pressure [Boiling-][Critical-]						kgf/cm ² -g	G12	Manufacturer model no.	
D52	Temp. [Boiling-][Condensation-]						°C	G13	Value [closed][open]	
D10	Density at ref. cond.						kg/m ³	G15	Solenoid valve A\B (tag no.)	XSOV -1103AN
D11	Dynamic viscosity						0.0166 cP	G14	Part number A\B	
D53	Molecular weight							G19	Manufacturer A\B	
D54	Compr.fact. (Z1/Zn)\sent.exp.							G20	Manufacturer model no. A\B	
D43	Max. allowable pressure drop							G21	Connection size A\B	1/4" NPT(F)
D41	Max. shut-off [p1-p2][p2-p1]						10 kgf/cm ²	G23	Limit switch op.\close (tag no.)	XZSH -1103AN XZSL -1103AN
D59	Remark (1)				G22	Part number A\B				
D60	Remark (2)				G27	Manufacturer A\B				
Component process design										
N01	Manufacturer/Model number	*		*				G28	Manufacturer model no. A\B	
N03	Type of construct./Bonnet style	Plug Valve		Standard				G30	Position indication (tag no.)	
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5				G29	Part number	
N43	Compon. conn.[DN][PN]	25 mm		150 #				G32	Manufacturer	
N44	Facing compon. conn.	RF, ASME 16.5						G33	Manufacturer model no.	
BM03	Face to face dim L (mm)							G34	Valve guard system (tag no.)	
N09	Material body/process conn.	Ductile Iron PFA lined						G35	Part number	
N70	Material [bonnet][bellow]	PFA lined						G36	Manufacturer	
N71	Material [seat][plug/disc/ball]	PTFE		PFA lined				G37	Manufacturer model no.	
N68	Trim type							Additional accessories/Material part no.		
N72	Treatment seat\plug	PTFE-Soft seat						N81	Air set	
N73	Material [bushing][stem]			SS PFA line				N82	Cable Entry	For SOV, 1/2" NPT, For LS, M20 X 1.5
N74	Packing [material][type]	PTFE		Standard packing				N85		
N75	Characteristic	On-Off						N60		
N76	Stroke\angle	90 Deg						N37	Remark(1)	
D63	Leakage requirement	ANSI VI (TSO)						N38	Remark(2)	
N10	Cleaning requirement							Component process design (continued)		
R83	Cvs [select.] \ Seat diam.							N11	SIL Class	
N78	Flow direction							N12	Remark(1)	
N67	Calc sound press. level max	<= 85					dB(A)	N13	Remark(2)	
TAG Identific. XV -1103AN		Part no. MDA0002		Inst. Type: On/Off Valve - Plug						
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Installation area data														
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area							
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.								
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)							
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)								
B55	Max. relative humidity	100 %			B21	Remark (2)								
B57	Altitude above sea level	348 m												
Process data					Location data									
B25	Fluid	Nitrogen Gas			B04	PI-Diagram / Sheet no.	11-14							
B41	Composition				B80	Reference location	0-BRC1-11A01BNZ04.P1-PL55C							
B42	Corrosive components				B84	Pipe spec. selected	PL55C							
B43	Toxic components				B97	Connection type								
B44	Abrasive components				B14	Line [DN][PN]								
B45	Suspended particles				B93	Connection facing								
B39	Special fluid properties (1)				B92	Line material	FRP-PP-R LIN, DERAKANE 470-300							
B40	Special fluid properties (2)				B64	Line diam.[inside][outside]								
B46	Water hazard class (WHC)				B15	Insulation [type][thickness]								
B47	Indicat. of danger (67/548/EEC)				B66	Heating/cooling[trace][temp.]								
B50	Pollution restriction				B70	Design pressure [min.][max.]	10 kgf/cm ² -g							
B48	Inline hazardous area				B72	Design temp. [min.][max.]	95 °C							
B26	Phase	Gas/Vapor			B98	Remark (1)	AdJusted Line Size: 25mm							
					B99	Remark (2)								
Runcase value				min.	norm.	max.	unit	Accessories						
D42	Flow rate					Am ³ /h								
D50	Mass flow rate													
D51	Actual flow [i.N.]													
D24	Operating pressure p1					kgf/cm ² -g								
D27	Operating pressure p2													
D40	Diff.pressure p1-p2					kgf/cm ²								
D30	Operating temperature t1		40			°C								
D33	Operating density					kg/m ³								
D45	Flashing					%								
D46	Operat. density vapour fraction													
D82	cv [calc.]													
D36	Pressure [Boiling-][Critical-]					kgf/cm ² -g								
D52	Temp. [Boiling-][Condensation-]					°C								
D10	Density at ref. cond.					kg/m ³								
D11	Dynamic viscosity			0.0166		cP								
D53	Molecular weight													
D54	Compr.fact. (Z1/Zn)\sent.exp.													
D43	Max. allowable pressure drop													
D41	Max. shut-off [p1-p2][p2-p1]			10		kgf/cm ²								
D59	Remark (1)				G01	Actuator type	Piston (single action), pneum.							
D60	Remark (2)				G02	Manufacturer								
Component process design					G03	Manufacturer model no.								
N01	Manufacturer/Model number	*		*	G04	Allow. air supply [min.][max]	4	6	kgf/cm ²					
N03	Type of construct./Bonnet style	Plug Valve		Standard	G05	Stroke time [open][close]	s							
N08	Compon. conn.[style][stand.]	Flanged		ASME B16.5	G06	Bench range/No. of springs								
N43	Compon. conn.[DN][PN]	25 mm		150 #	G38	Fail safe position/Handwheel	FO	No						
N44	Facing compon. conn.	RF, ASME 16.5			G07	Tubing [material][size]	SS316	8	mm					
N43	Face to face dim L (mm)				G09	Positioner (tag no.)								
N09	Material body/process conn.	Ductile Iron PFA lined			G10	Part number								
N70	Material [bonnet][bellow]	PFA lined			G11	Manufacturer								
N71	Material [seat][plug/disc/ball]	PTFE		PFA lined	G12	Manufacturer model no.								
N68	Trim type				G13	Value [closed][open]								
N72	Treatment seat\plug	PTFE-Soft seat			G15	Solenoid valve A\B (tag no.)	XSOV -1103BN							
N73	Material [bushing][stem]			SS PFA lined	G14	Part number A\B								
N74	Packing [material][type]	PTFE		Standard packing	G19	Manufacturer A\B								
N75	Characteristic	On-Off			G20	Manufacturer model no. A\B								
N76	Stroke\angle	90 Deg			G21	Connection size A\B	1/4"	NPT(F)						
D63	Leakage requirement	ANSI VI (TSO)			G23	Limit switch op.\close (tag no.)	XZSH -1103BN	XZSL -1103BN						
N10	Cleaning requirement				G22	Part number A\B								
R83	Cvs [select.] \ Seat diam.				G27	Manufacturer A\B								
N78	Flow direction				G28	Manufacturer model no. A\B								
N67	Calc sound press. level max	<= 85 dB(A)			G30	Position indication (tag no.)								
TAG Identific. XV -1103BN Part no. MDA0002 Inst. Type: On/Off Valve - Plug					G29	Part number								
					Instrument Data Sheet					UAN / Code PACL_350TPD 660215 Plant PACL_EXPANSION				
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Installation area data									
B51	Installation location	Outdoor installation			B67	Remote hazardous area class	Non hazardous area		
B52	Corrosive influence by (1)				B68	Remote area min. ign. temp.			
B53	Ambient temp. [min.][max.]	2	48	°C	B69	Max. allow. sound press. level	85 dB(A)		
B54	Ambient work. temp. [min.][max.]	2	48	°C	B20	Remark (1)			
B55	Max. relative humidity	100 %			B21	Remark (2)			
B57	Altitude above sea level	348 m							
Component process design					Mechanical design				
N01	Manufacturer	SEE LIST			N14	Enclosure protection class	Weather proof IP 65		
N02	Manufacturer model no.	SEE LIST			N15	Case [type][size]			
N03	Type of construction	Standard acc. supplier			N16	Material case			
Y45	Operation style	3/2-way solenoid valve			N79	Connection size	SEE LIST		
Y46	Resting position	NC			F01				
Y28	Mounting location / type				F02	Seat / O ring material	BUNA N		
Y29	Material mounting set	Single coil			N25	Remark (1)			
Y47	Coil type	SS316			N26	Remark (2)			
Y48	Coil rating [voltage][load]	110V AC							
Y49	Coil insulation class	Class H							
N11	SIL Class								
F01									
F02									
N12	Remark(1)								
N13	Remark(2)								
Electrical design					Pneumatic / hydraulic design				
N27	Signal rate				Y71	Auxiliary energy	110 VAC		
N28	Type of signal	DO			Y33	Press. rating supply [min][max]			
Y78	Apparent ohmic resistance				Y36	Connector style			
Y54	Signal characteristic				Y37	Connector size [supply][signal]			
N29	Signal if faulty				Y38	Tube o.D. [supply][signal]			
N96	ATEX code	*			Y39	Material connector			
T54	Auxiliary power	No			Y40	Material tubing			
F01									
N32	Remark (1)								
N33	Remark (2)								
					Y93	Remark(1)			
					Y94	Remark(2)			

Notes

- SOV shall be direct operated; Pilot operated SOV's are not acceptable.
- Cable entry: 1/2" NPT(F) with built in junction box suitable for termination of 2.5 Sq.mm wires.

TAG Identific. SEE LIST		Part no.		Inst Type		Solenoid valve	
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Tag Number	N79 Connection Size	N01 Manufacturer	N02 Manufacturer model no
XSOV -0516AN	1/4"	*	*
XSOV -0516BN	1/4"	*	*
XSOV -0534N	1/4"	*	*
XSOV -0605AN	1/4"	*	*
XSOV -0605BN	1/4"	*	*
XSOV -0613N	1/4"	*	*
XSOV -0614N	1/4"	*	*
XSOV -1102AN	1/4"	*	*
XSOV -1102BN	1/4"	*	*
XSOV -1103AN	1/4"	*	*
XSOV -1103BN	1/4"	*	*

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