

SPECIFICATION FOR PRESSURE SAFETY VALVES

Technical Requirements:

1. The Valves shall be tested for Seat Tightness as per API 527 upon receipt at NRL site. **Payment shall be released only after passing the Seat Tightness test. In case of failure, Vendor to replace the defective valves without any cost implication upon NRL.**
2. All dimensions shall be provided in the Data sheet to the extent possible. **If any further dimensions are required, Vendor to visit NRL site and collect the same.**
3. **Vendor should assume responsibility of Fitment & Interchangeability of the valves with the valves installed at NRL site.**
4. Only 2 nos. spring guide viz. one at the top and one at bottom is admissible. Increase in spring tension by means of introduction of spacer etc. shall not be acceptable.
5. The disc of the PSV shall be of flexible two-piece disc holder-disc insert type design. The disc should not be of fixed mounted type on the disc holder. The flexibility between disc-disc holder should allow the disc to adjust to slight misalignments.
6. The PSV/TSV design/sizing should strictly conform to the Technical Specifications furnished in the respective Data sheets **only**. If any deviation from the data sheet is sought, the same needs to be clearly stated along with elaborate reasons for seeking the deviation. The acceptance/ rejection of the deviation shall be established during final Technical Evaluation. Vendor must submit their respective PSV design data sheets containing all details of the PSV like size, component Material of Construction, capacity etc.

1.0 GENERAL

1.1 Scope

1.1.1 This specification, together with the data sheets covers the requirements for the design, materials, fabrication, nameplate making, inspection, testing and shipment of pressure relief valves.

1.1.2 The related standards referred to herein and mentioned below shall be of the latest editions prior to the date of the purchaser's enquiry: -

ASME	American Society of Mechanical Engineers.
B 1.20.1	Pipe Threads General Purpose (Inch)
B 16.5	Pipe Flanges and Flanged Fittings
B 16.20	Metallic Gaskets for Pipe Flanges-Ring Joint, Spiral wound and Jacketed.
B 16.34	Valves-Flanged, Threaded and Welding End
Sec-VIII	Boiler and Pressure Vessels Code Section VIII "Pressure Vessels"

	Sec-I	Boiler and Pressure Vessels Code. Section-I 'Power Boilers'
API	American Petroleum Institute	
	520	Sizing, Selection, and Installation of Pressure Relieving Devices in Refineries.
		Part I Sizing & Selection
		Part II Installation
	521	Guide for Pressure Relieving and Depressurizing Systems.
	526	Flanged Steel Pressure Relief Valves.
	527	Seat Tightness of Pressure Relief Valves.
EN	European Standards	
	10204	Inspection Documents for Metallic Products.
IBR	Indian Boiler Regulations	

1.1.3 In the event of any conflict between this specification, data sheets, related standards, codes etc., the following order of priority shall govern:

- a) Statutory Regulations
- b) Data Sheets
- c) Standard Specification
- d) Codes and Standards

1.1.4 In addition to compliance to purchaser's specifications in totality, vendor's extent of responsibility shall include the following,

- a) Purchaser's data sheets indicate the type , size, etc, of the existing valve. However, vendor shall be responsible to size and select the proper valve with orifice relieving area meeting the indicated operating conditions.
- b) Purchaser's data sheets must specify the acceptable materials for body, bonnet, disc, nozzle, spring, bellows etc. Wherever applicable the vendor must specify the material of construction & the vendor should assume complete responsibility for the selected materials for their compatibility with the specified fluid and its operating conditions.
- c) The vendor shall submit their own technical offer for each of the valves and shall provide all

the data which are not available in the purchaser's data sheets and shall be responsible for satisfactory performance as per the operating parameters furnished by the purchaser.

1.2 Bids

1.2.1 Vendor's quotation shall include the following:

- a) Detailed specification sheet for each item which shall provide information regarding type, construction materials, relieving area, relieving capacity, orifice letter designation, overpressure, blow down, operation pressure etc. and any other valve accessories. The material specifications and units of measurement for various items in vendor's specification sheets shall be to the same standards as those indicated in purchaser's data sheets. If the data sheets do not contain some of the data than the vendor must provide suitable data as per the operating parameters provided in the purchaser's data sheets and must take full responsibility for the same.
- b) Catalogues giving detailed technical specification, model decoding details and other related information for each type of pressure relief valve covered in the bid.

1.2.3 All documentation submitted by the vendor including their quotation, catalogues, drawings, Installation, operation, and maintenance manuals etc. shall be in English language only.

1.3 Drawing and Data

1.3.1 The vendor must provide detailed drawings, data, catalogues, and manuals along with the supply in both hard and soft copies.

1.3.2 Final documentation consisting of design data, installation manual, operation, and maintenance Manual etc. submitted by the vendor after placement of purchase order shall include the following as a minimum.

- a) Specification sheets for each pressure relief valve and its accessories.
- b) Certified drawing sheets for each pressure relief valve accessories, which shall provide dimensional details, internal construction details, end connection details, weight and material of construction.
- d) Copy of type test certificates.
- e) Copy of test certificates for all the tests indicated in clause 4.0 of this specification.
- f) Installation procedure for Pressure relief valve and its accessories.
- g) Calibration and maintenance procedure including replacement of internals wherever Applicable.

2.0 DESIGN AND CONSTRUCTION

2.1 Valve Design

- 2.1.1 The valve dimensions should be as per the purchaser's data sheets, if provided.
- 2.1.2 Unless specified otherwise, all pressure relief valves shall be full nozzle full lift type and all relief valves in the thermal safety application shall be modified nozzle type.
- 2.1.3 The design of pressure relief valves in steam under IBR design code shall be governed by regulation 294 and 295 of IBR. However, where design code is specifically indicated as ASME Section I, the valve design shall meet the pressure relief valve requirements specified in ASME Section I.

2.2 Valve Sizing

- 2.2.1 Sizing shall be carried out using the formulae mentioned in the following standards whenever the sizing code mentioned in the purchaser's data sheets refers to these.

Sizing Code	Standard
API	API RP 520 part 1
	API RP 521
ASME	Boiler and Pressure vessel code Section VIII 'Pressure Vessels'
	Boiler and Pressure vessel code Section – I 'Power Boilers'
IBR	Indian Boiler Regulations, paragraph -293

- 2.2.2 Discharge Co-efficient

Following Discharge coefficients values shall be used for sizing of pressure relief valves.

- a) For all valves in gas, vapor or steam service with design code as ASME Sec VIII or ASME Section I discharge co-efficient of 0.975 as per API 520 shall be used.
 - b) For all valves in steam services covered under IBR design code, discharge coefficient either be selected as per Regulation 293 or as tested and certified by IBR as per Appendix 'L' of IBR.
- 2.2.3 For the selected orifice letter designation and inlet and outlet size of the pressure relief valve, relieving area of the valve offered by vendor shall meet those in API-526.

- 2.24 The Discharge capacity of the selected pressure relief valves shall be calculated based on Certified ASME capacity curves or by using ASME certified discharge coefficient and actual orifice area. Higher valve size shall be selected in case pressure relief valve discharge capacity so computed, is less than the required flow rate.
- 2.25 For pressure relief valve covered under ASME Sec-I design code, the valve design shall conform to ASME Section I requirements with selected area higher of the calculated as per ASME Section I requirements and that calculated as per regulation 293 of IBR.

2.3 Valve Construction

2.3.1 Body

2.3.1.1 Unless otherwise mentioned, end connection details shall be as below: -

- a) Threaded end connections shall be to NPT as per ASME B 1.20.1.
- b) Flanged end connections shall be as per ASME B 16.5
- c) Flanged face finish shall be as per ASME B 16.5. The face finish as specified in the data Sheets shall be as follows.

125 AARH : 125 to 250 micro inch AARH

63 AARH : 32 to 63 micro inch AARH

2.3.1.2 For flanged valves, inlet and outlet sizes and ratings and center to flange face dimensions shall be in accordance with API-526. Dimensional tolerance shall be as mentioned therein.

2.3.1.3 Body drain with a plug shall be provided as a standard feature on every pressure relief valve.

2.3.2 Trim

2.3.2.1 The term 'trim' covers all the part of the valves, which are exposed to and in contact with the Process fluid except for the body and bonnet assembly i.e., nozzle, disc, disc holder, stem etc.

2.3.2.2 Valves shall be of the full nozzle type of design.

2.3.2.3 Wherever stellite of disc and nozzle has been specified, it stands for stellite of the seat Joint and the entire disc contour, unless otherwise mentioned.

2.3.2.4 For high temperature application, the materials for the internals shall be selected to avoid galling.

2.3.2.5 Pressure relief valves with design as per ASME Section I, shall have two adjustable rings to Adjust valve over-pressure and blow down.

2.3.2.6 Resilient seat, seals or O-rings wherever used shall be suitable for pressure and temperature Conditions specified.

2.3.2.7 Gaskets wherever used shall be metallic type. Gaskets with asbestos filler or with asbestos bearing material shall not be used.

2.3.3 Bonnet and Spring

2.3.3.2 All valves shall be provided with a cap cover the adjusting bolt. Cap shall be of either bolted type or screwed type.

2.3.3.3 Lifting lever shall be provided whenever the fluid to be relived is steam and air or water above 65° C.

2.3.3.3 Valve spring shall be selected such that it can permit an adjustment of = 5% of the set pressure, as a minimum.

2.3.3.4 Carbon steel spring shall be made corrosion resistant through plating/coating as per manufacturer's standard design or as specified in the purchaser's data sheets.

2.3.3.5 The allowable tolerance in set pressure is as below:

- a) =0.14kg/cm² g for set pressure up to and including 5kg/cm² g
- b) = 3% for set pressure above 5kg/cm² g.

2.3.3.6 Bonnet shall be of the closed type for all process applications in general. Open type bonnet shall be only for steam and non-hazardous/ non- toxic fluids. For all steam applications under design code IBR or ASME Section I with open bonnet design, weather protection cover shall be provided.

3.0 NAMEPLATE

3.1 Each pressure relief valves shall have a stainless steel nameplate attached firmly to it at a visible place, furnishing the following information: -

- a) Tag number as per purchaser's data sheet.
- b) Manufacturer's serial number and/or model number.
- c) Manufacturer's name/trademark.

- d) Nominal flanges size in inches and rating in pounds for both inlet and outlet.
 - e) Orifice letter designation.
 - f) Valves set pressure.
 - g) Cold bench test set pressure.
- 3.2 For the above, pressures shall be marked in the same units as those followed in purchaser's data sheets.

4.0 INSPECTION AND TESTING

Valves coming under the purview of IBR shall be inspected by Independent Inspecting Authority approved by Indian Boiler Board and the test certificate in IBR form III-C duly countersigned by IBR approved authority shall be submitted. The certificate shall be submitted in original along with the supply.

For non-IBR valves also the original test certificate as per the API 527 must be submitted along with the supply.

5.0 SHIPPING

- 5.1 Valves shall be supplied as a whole, complete with all the accessories like cap, lifting lever, test gag etc.
- 5.2 All threaded and flanged openings shall be suitable protected to prevent entry of foreign material.
- 5.3 All pressure relief valves in oxygen and chlorine services shall be separately packed along with a certificate 'CERTIFIED FOR OXYGEN/CHLORINE SERVICE', AS applicable.

6.0 REJECTION

- 6.1 Vendor shall prepare their offer strictly as per clause 1.2 of this specification and shall attach only those documents which are specifically indicated in the material requisition.
- 6.2 Any offer not conforming to above requirements, shall be summarily rejected.

RFQ number : 6100029195

Item	Material Code	Description	Order Qty	UoM
00010	M-PSV-112-000	PSV for 21-PSV-1357 PSV for 21-PSV-1357;Set Pr: 9 kg/cm ² ;CDSP: 9 kg/cm ² ;Relieving Temperature: 65 deg C;Over Pressure: 10 %;Discharge Coefficient: 0.777;Back Pressure Corr. Factor:1.00; Service: Water;State:Liquid;Capacity: 6m ³ /hr;Sp. Gravity: 1.00;Viscosity: 0.2cPs;Inlet Flange: NPS 1 150 Class RF as per ASME B16.5; Outlet Flange: NPS 2 150 Class RF ASME B16.5	1	Numbers
00020	M-PSV-113-000	TSV for 44-TSV-1801 TSV for 44-TSV-1801;Set Pr: 9.0 kg/cm ² ;CDSP: 9.09 kg/cm ² ;Back Pressure: ATM;Operating Pressure: 7.0 kg/cm ² ;Rel. Temperature: 160 deg C;Operating Temperature:90.0 deg C;Over Pressure: 25kg/cm ² ;Service: Fuel oil;Inlet:0.75" NPTM; Outlet:1"NPTF Fluid State: Liquid.	1	Numbers
00030	M-PSV-114-000	TSV for 40-TSV-1102 TSV for 40-TSV-1102;Set Pr: 34.0 kg/cm ² ;CDSP: 34.34 kg/cm ² ;Back Pressure: ATM;Operating Pressure: 27.0 kg/cm ² ;Rel. Temperature: 160 deg C;Operating Temperature:40.0 deg C;Over Pressure: 25kg/cm ² ;Service: Crude;Inlet:0.75" NPTM; Outlet:1"NPTF Fluid State: Liquid.	1	Numbers
00040	M-PSV-115-000	TSV for 44-TSV-1301 TSV for 44-TSV-1301;Set Pr: 9.0 kg/cm ² ;CDSP: 9.00 kg/cm ² ;Back Pressure: ATM;Operating Pressure: 5.0 kg/cm ² ;Rel. Temperature:65 deg C;Operating Temperature:AMB;Over Pressure: 25kg/cm ² ;Service: Aviation Turbine Fuel;Inlet:0.75" NPTM; Outlet:1"NPTF Fluid State: Liquid.	1	Numbers
00050	M-PSV-116-000	TSV for 44-TSV-1302 TSV for 44-TSV-1302;Set Pr:18.0 kg/cm ² ;Back Pressure: ATM;Operating Pressure: 4.0 kg/cm ² ;Rel. Temperature:65 deg C;Operating Temperature:AMB;Over Pressure: 25kg/cm ² ;Service: Aviation Turbine Fuel;Inlet:0.75" NPTM; Outlet:1"NPTF Fluid State: Liquid.	1	Numbers
00060	M-PSV-117-000	PSV for 34-PSV-728 (N) PSV for 34-PSV-728 (N);Set Pr: 35kg/cm ² (g);Operating Pressure:40 kg/cm ² (g);Operating Temperature:105 deg C;Service: Boiler Feed Water; Inlet & Outlet Size: 1.5" & 2"; 600 Rating;Ends:Flanged to B16.5 RF; Back Pressure: Atm; Allowable Over Pr.:10%;Flow Rate:10 m ³ /hr	1	Numbers
00070	M-PSV-196-000	PSV for 34-PSV-1161/1162/2161/2162 PSV for 34-PSV-1161/1162/2161/2162;Set Pr:40kg/cm ² (A);Back Pressure:2-3 kg/cm ² (A);Service:Natural Gas; Inlet Size: 1" Flange 300#;Outlet Size: 2" Flange150#;Flange Facing: RF Smooth Finish 125 AARH Operating Temperature: 5deg C (min)-38 deg C (max)	4	Numbers
00080	M-PSV-197-000	PSV for 34-PSV-1163/1164/2163/2164 PSV for 34-PSV-1163/1164/2163/2164;Set Pr:25kg/cm ² (A);Back Pressure:2-3 kg/cm ² (A);Service:Natural Gas; Inlet Size: 2.5" Flange 300#;Outlet Size: 4" Flange150#;Flange Facing: RF Smooth Finish 125 AARH Operating Temperature:	4	Numbers

RFQ number : 6100029195

Item	Material Code	Description	Order Qty	UoM
		40deg C (min)-60 deg C (max)		
00090	M-PSV-198-000	PSV for 34-PSV-1165/1166/2165/2166 PSV for 34-PSV-1165/1166/2165/2166;Set Pr:40kg/cm ² (A);Back Pressure:2-3 kg/cm ² (A);Service:Natural Gas; Inlet Size: 1" Flange 300#;Outlet Size: 2" Flange150#;Flange Facing: RF Smooth Finish 125 AARH Operating Temperature: 5deg C (min)-38 deg C (max)	4	Numbers
00100	M-PSV-190-000	PSV for 34-PSV-101(PNG) PSV for 34-PSV-101(PNG);Set Pr:8.0kg/cm ² (g); Set Pressure Range:7-9 kg/cm ² (g);Relieving Tempearture:65 deg C;Design Temperature: 65 deg C;Service: Natural Gas State: Gas/Vapor; Inlet Size: 1.5"/150#RF Serrated;Outlet Size: 3"/ 150# RF Serrated; Back Pressure: Atm; Allowable Over Pr.:10%;Flow Rate:2449.41 Sm3/hr	1	Numbers
00110	M-PSV-192-000	PSV for 07-PSV-1007 PSV for 07-PSV-1007;Set Pr:3.5kg/cm ² (g);Back Pressure:0.5 kg/cm ² ;Operating Temperature :60-70 deg C;Service: H2S Gas+Water Vapor Traces State:Gas; Inlet Size: 1.5";Outlet Size: 2" Line Rating:150 lb(A2A).	1	Numbers
00120	M-PSV-128-00	SAFETY VALVE, TAG NO. 07-PSV-1401/1402 SAFETY VALVE, TAG NO. 07-PSV-1401/1402	2	Numbers
00130	M-PSV-195-000	PSV for 16-PSV-1505 PSV for 16-PSV-1505;Set Pr:16.5kg/cm ² (g);Back Pressure:1.7 kg/cm ² (g);Service:MP Steam; Inlet Size: 2" 300# RF ;Outlet Size: 3"150#RF	1	Numbers
00140	M-S-VLVE-834-00	TSV for 04-TSV-2108 TSV for 04-TSV-2108;Set Pressure: 7 Kg/cm2G; Back Pr: Atm; Service: Cooling Water Return; State: Liquid, Inlet Connection: 0.5" threaded, Outlet Connection: Discharge to Atmosphere	1	Numbers
00150	M-S-VLVE-835-00	TSV for 04-TSV-2208 TSV for 04-TSV-2208;Set Pressure: 7 Kg/cm2G; Back Pr: Atm; Service: Cooling Water Return; State: Liquid. Inlet Connection: 0.5" threaded, Outlet Connection: Discharge to Atmosphere	1	Numbers
00160	M-S-VLVE-836-00	TSV for 04-TSV-2308 TSV for 04-TSV-2308;Set Pressure: 7 Kg/cm2G; Back Pr: Atm; Service: Cooling Water Return; State: Liquid. Inlet Connection: 0.5" threaded, Outlet Connection: Discharge to Atmosphere	1	Numbers
00170	M-S-VLVE-837-00	TSV for 04-TSV-403B TSV for 04-TSV-403B;Set Pressure: 7 Kg/cm2G; Back Pr: Atm; Service: Cooling Water Return; State: Liquid.Inlet Connection: 0.5 Inch 150# rating flange; Outlet Connection: Discharge to atmosphere.	1	Numbers
00180	M-S-VLVE-838-00	TSV for 04-TSV-403D	1	Numbers

RFQ number : 6100029195

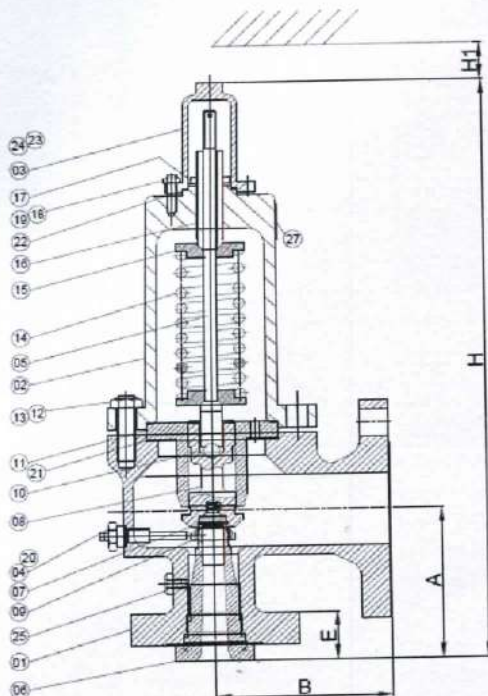
Item	Material Code	Description	Order Qty	UoM
		TSV for 04-TSV-403D;Set Pressure: 7 Kg/cm2G; Back Pr: Atm; Service: Cooling Water Return; State: Liquid.Inlet Connection: 0.5 Inch 150# rating flange; Discharge Connection: Discharge to atmosphere.		
00190	M-S-VLVE-839-00	PSV for 08-PSV-1014(PTHE) PSV for 08-PSV-1014(PTHE);Set Pressure:22 Kg/cm2G; Back Pr. (Variable): 0.5 kg/cm2G (max); Service: Sour Water.	1	Numbers
00200	M-S-VLVE-840-00	PSV for 08-PSV-1005(PTHE) PSV for 08-PSV-1005(PTHE);Set Pressure:22 Kg/cm2G; Back Pr. (Variable): 0.5 kg/cm2G (max); Service: Sour Water.	1	Numbers
00210	M-S-VLVE-841-00	TSV for 11-TSV-1301(PTHE) TSV for 11-TSV-1301(PTHE);Set Pressure:11 Kg/cm2G; Back Pr. (Variable): 0.5 kg/cm2G (max); Service: Sour Water.	1	Numbers
00220	M-S-VLVE-842-00	TSV for 45-TSV-2211 TSV for 45-TSV-2211;Set Pressure:15 Kg/cm2G; Back Pr.: Atm.; Service: Motor Spirit.	1	Numbers
00230	M-S-VLVE-843-00	TSV for 44-TSV-3301 TSV for 44-TSV-3301; Inlet Connection: 3/4" & A10A (150#); Outlet Connection: 1" & A10A (150#)	1	Numbers
00240	M-PSV-062-000	Pressure Safety Valve. Tag: 06-PSV-2101B Pressure Safety Valve. Tag: 06-PSV-2101B; Service: STEAM DRUM; Set Pr.: 48.50 kg/cm2 G; Service Temp.: 262deg. C; Cold Differential Set Pr.: 48.50 kg/cm2; Back Pr.: ATM; Over Pr.: 5%	1	Numbers
00250	M-PSV-063-000	Pressure Safety Valve. Tag: 06-PSV-2101C Pressure Safety Valve. Tag: 06-PSV-2101C; Service: STEAM DRUM; Set Pr.: 49 kg/cm2 G; Service Temp.: 262deg. C; Cold Differential Set Pr.: 48.50 kg/cm2; Back Pr.: ATM; Over Pr.: 5%	1	Numbers
00260	M-S-VLVE-296-00	Safety Valve; Tag 01-TSV-2301A/B; Safety Valve, 01-PSV-2301A/B, inlet 3/4" MNPT, outlet 1" FNPT Set pressure 10 Kg/cm2, temperature 65°C	2	Numbers
00270	M-S-VLVE-295-00	Safety Valve; Tag:01-TSV-1207; Safety Valve ,01-TSV-1207, inlet 3/4" MNPT, outlet 1"FNPT Set pressure 40.0 Kg/cm2,CDTP 41.20 kg/cm2,temperature 312C°	1	Numbers

01-TSV-2301

Safety Valve Inspection & Service Report

<u>INFORMATION</u>		<u>CONDITIONS</u>		<u>MATERIALS</u>
Tag No	01-TSV-2301	Set Pres.(Kg/cm2)	8.0	Material -Body& Bonnet ASTM A 105
Manufacturer		Back Pres.(Kg/cm2)	ATM	Material Nozzle & Disc SS 316
Style	S15F04C0LO3 LEVER	Fluid State	LIQUID	Material Bellow NIL
Line No.	.75"-WCR-01-2302-A3	Operating Pres.(Kg/cm2)	2.5	Material Spring CD PLATED CS
Vessel Protected	01-EE-00-056	Op. Temp.(c)	45	<u>DIMENSIONS</u>
Valve Sl. No.		CDSP	8	
Service	CW			Inlet Connection(Size & Rating) .75" NPTM
				Outlet Connection(Size & Rating) 1" NPTM
				Orifice Size (Sqr. Cm) 0.38

**PRESSURE SAFETY VALVE
DATA SHEET**



DIMENSIONS	A (±3)	B (±3)	E (±3)	H (±25)	H1
IN MM	124	121	34	540	100

SR NO	PART NAME	MATERIAL
1	BODY	A216 GR. WCB
2	BONNET	A216 GR. WCB
3	CAP	A216 GR. WCB
4	NOZZLE RING PIN	A479 GR. 316
5	SPINDLE	A479 GR. 316
6	NOZZLE	A351 GR. CF8M
7	DISC	A479 GR. 316
8	PISTON	A479 GR. 316
9	NOZZLE RING	A351 GR. CF8M
10	BALL	SS304
11	GUIDE	A351 GR. CF8M
12 & 13	BONNET STUD & NUT	B7 & 2H
14	SPRING	SS316
15	SPRING WASHER	A479 GR. 304
16	ADJUSTING BOLT	A479 GR. 304
17	ADJ BOLT NUT	A479 GR. 304
18 & 19	CAP STUD & NUT	B7 & 2H
20, 21, & 22	GASKET	GRAPHOIL WITH SS304 FILLER
25	DRAIN PLUG	A479 GR. 304

GENERAL

CLIENT	
TAG NO.	PSV 101
SYSTEM NO.	S11173-140280
VALVE SR. NO	
P.O. NO	
MODEL NO	
TYPE	ANGLE
QUANTITY (Nos.)	01
INLET/CLASS & FACING	1.5" / 150# RF Serreted
OUTLET/CLASS & FACING	3" / 150# RF Serreted

SERVICE CONDITION

FLUID	STATE	NATURAL GAS	Gas/Vapour
RELIEVING TEMP		65°C	
DESIGN TEMP		65°C	
SET PRESSURE		8.0 Kg/cm2g	
SET PRESSURE RANGE		7.0 to 9.0 Kg/cm2g	
BACK PRESSURE		ATM	
COLD DIFFERTIAL TEST PR. (CDTP)		8.0 Kg/cm2g	
TEST MEDIUM		AIR	
HYDRO TEST PR NOZZLE		31.0 Kg/Cm2 g	
HYDRO TEST PR BODY		31.0 Kg/Cm2 g	
SEAT TIGHTNESS PR		7.20 Kg/cm2g	
PNEUMATIC TEST PR		2.10 Kg/cm2g	
OVER PRESSURE		10%	

VALVE SIZING DATA

MAX FLOW CAPACITY	2449.41 Sm3/Hr
SELECTED ORIFICE AREA (cm ²)	3.245
ORIFICE DESIGNATION (LETTER)	"G"

OPTIONAL ASSECORY

	YES/NO
TEST GAG REQUIRED	NO
NOZZLE/DISC STELLITED	NO
VALVE WITH LEVER ASSEMBLY	NO
SPECIAL PAINT REQUIRED	NO
SPARE REQUIRED	NO
NDT REQUIREMENT	NO
BALANCE BELLOW REQUIRED	NO

REMARKS :

REV	DATE	REMARK	MADE	CHKD.
1				
2				
3				
4				

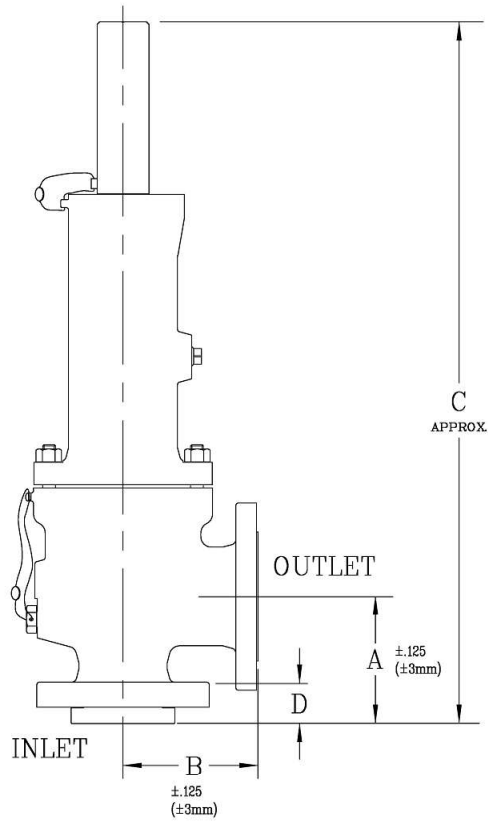
01-TSV-1207

Safety Valve Inspection & Service Report

INFORMATION		CONDITIONS		MATERIALS
Tag No	01-TSV-1207	Set Pres(Kg/cm2)	40	Material -Body& Bonnet ASTM A 105
Manufacturer		Back Pres.(Kg/cm2)	ATM	Material Nozzle & Disc SS 316
Style	2740ULT-W/TG	Fluid State	LIQUID	Material Bellow NIL
Line No.	0.75"-P-01-1227-D1A-1T	Operating Pres.(Kg/cm2)	20.0	Material Spring CD PLATED CS
Vessel Protected	01-EE-00-014A	Op. Temp.(c)	286.5	DIMENSIONS
Valve Si. No.		CDS P	41.5	
Service	CRUDE			Inlet Connection(Size & Rating) .75" NPTM
				Outlet Connection(Size & Rating) 1" NPTM
				Orifice Size (Sqr. Cm) 0.48

		SAFETY VALVE DATA SHEET (Process + Mechanical)		Forbes Marshall Pvt. Ltd., Pune, INDIA Doc. No.	
GENERAL	Unit	HCU BRS			1
	P&ID Ref. No.	FMOPC-HCU-PID-04-0004			2
	Item No.	PSV 5605			3
	Area Classification	IEC Zone 2, Gas Group IIC, T3			4
	Type	Full Lift Safety Valve			5
PROCESS DATA	Inlet Medium	Steam			6
	Process Parameter:	Unit:			7
	Operating Pressure	Bar(g)	3.74 / 4.5 (min / max)		8
	Set Pressure	Bar(g)	6.0		9
	Operating Temperature	Deg C	155		10
	Design Temperature	Deg C	200		11
	Max. Flow Rate	Kg/hr	400		12
	Hydro Test Pressure	Bar(g)	9		13
MECHANICAL DATA	MATERIAL OF CONSTRUCTION	Body	ASTM A216 WCB , Cast Steel		14
		Nozzle	ASTM A105 , Carbon Steel		15
		Spring	50Cr V4 , High Grade Steel		16
		Seat	Stainless Steel		17
					18
END CONNEC.	End Connections	Threaded			19
	Inlet	20NB, Screwed BSPT			20
	Outlet	25NB, Screwed BSPT			21
	Approvals	IBR			22
Customer Name: M/s. Numaligarh Refinery					
Project Name: Condensate Recovery System					

06-PSV-2101 B (IBR Valve)



Wt.=

A= 170 mm

B= 190mm

C= 780mm

D=

E=

F=

G=

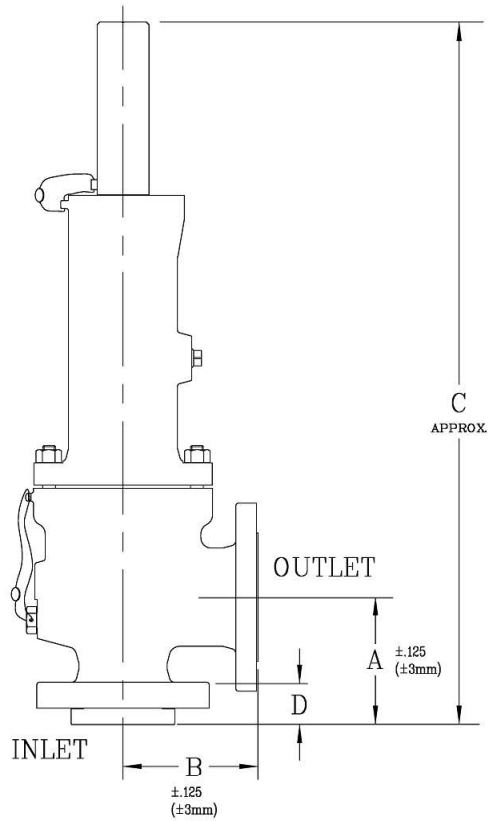
H=

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Service Details:

1. Service: HP Steam
2. Set Pressure: 48.5 kg/cm²
3. CDSP: 50.50 kg/cm²
4. Back Pressure: Atm
5. MoC of Body & Bonnet: A216-WCB
6. MoC of Nozzle & Disc: A351-CF8M
7. Spring SRV Steel
8. Size & Orifice: 2.5-J-4/600

06-PSV-2101 C (IBR Valve)



Wt.=

A= 170 mm

B= 190mm

C= 780mm

D=

E=

F=

G=

H=

=

Service Details:

1. Service: HP Steam
2. Set Pressure: 49 kg/cm²
3. CDSP: 50.50 kg/cm²
4. Back Pressure: Atm
5. MoC of Body & Bonnet: A216-WCB
6. MoC of Nozzle & Disc: A351-CF8M
7. Spring SRV Steel
8. Size & Orifice: 2.5-J-4/600

PROCESS DATA SHEET		NUMALIGARH REFINERY LTD		
		TECHNICAL SERVICE		
		PROCESS TECHNOLOGY		
Job No.	Proccurment of PSV			
Job Description	Proccurment of PSV		Rev. No.	0
Unit	SRU			
Tag No	07-PSV-1007			
Service	Condesate pot pressure protection			
Location	AG Condesate pot			
FLUID				
FLUID STATE @ SV INLET		VAPOUR		
OPERATING TEMPERATURE	DEG C	90		
RELIEVING TEMPERATURE	DEG C	152.6		
OPERATING PRESSURE	KG/CM2 G	0.55		
SET PRESSURE	KG/CM2 G	3.5		
MAXIMUM BACK PRESSURE	KG/CM2 G	0.5		
BACK PRESSURE CONSTANT/VARIABLE		VARIABLE		
% OVER PRESSURE		20		
BASIS OF SELECTION		VESSEL EXT FIRE CASE		
VALVE DISCHARGE TO		ACID GAS FLARE HEADER		
DATA AT SV INLET				
REQUIRED DISCHARGE CAPACITY	Kg/hr	290		
LIQUID				
VAPOUR / GAS		LP STEAM		
LIQUID PROPERTIES @ REL. TEMP.				
DENSITY	KG/M3	NA		
VISCOSITY	CP	NA		
GAS AND VAPOUR PROPERTIES				
MOLECULAR WEIGHT		18		
COMPRESSIBILITY FACTOR		0.98		
Cp/Cv		1.24		
INLET CONNECTION SIZE&RATING		1.5" Flange 150#		

OUTLET CONNECTION SIZE&RATING			2" Flange 150#		
NOTES:					
1.To be confirmed during detail design/engineering					
0	03.05.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

PROCESS DATA SHEET		NUMALIGARH REFINERY LTD		
		TECHNICAL SERVICE		
		PROCESS TECHNOLOGY		
Job No.	Proccurment of PSV			
Job Description	Proccurment of PSV		Rev. No.	0
Unit	SRU			
Tag No	07-PSV-1401/1402			
Service	Over pressure protection			
Location	07-EE-006/7			
FLUID				
FLUID STATE @ SV INLET		VAPOUR		
OPERATING TEMPERATURE	DEG C	133-152.6		
RELIEVING TEMPERATURE	DEG C	168		
OPERATING PRESSURE	KG/CM2 G	2-4.2		
SET PRESSURE	KG/CM2 G	6.5		
MAXIMUM BACK PRESSURE	KG/CM2 G	ATM		
BACK PRESSURE CONSTANT/VARIABLE		VARIABLE		
% OVER PRESSURE		20		
BASIS OF SELECTION		BLOCKED DISCHARGE		
VALVE DISCHARGE TO		ATMOSPHERE		
DATA AT SV INLET				
REQUIRED DISCHARGE CAPACITY	Kg/hr	275		
LIQUID				
VAPOUR / GAS		LP STEAM		
LIQUID PROPERTIES @ REL. TEMP.				
DENSITY	KG/M3	NA		
VISCOSITY	CP	NA		
GAS AND VAPOUR PROPERTIES				
MOLECULAR WEIGHT		18		
COMPRESSIBILITY FACTOR		0.98		
Cp/Cv		1.24		
INLET CONNECTION SIZE&RATING		1.5" Flange 150#		

OUTLET CONNECTION SIZE&RATING			2" Flange 150#		
NOTES:					
1.To be confirmed during detail design/engineering					
0	03.05.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

PROCESS DATA SHEET		NUMALIGARH REFINERY LTD		
		TECHNICAL SERVICE		
		PROCESS TECHNOLOGY		
Job No.	Proccurment of PSV(New)			
Job Description	Proccurment of PSV(New)		Rev. No.	0
Unit	SWSU			
Tag No	08-PSV-1005(PTHE)			
Service	Sour water			
Location	At O/L of 08-EE-009			
FLUID				
FLUID STATE @ SV INLET			Liquid	
OPERATING TEMPERATURE	DEG C	158.5		
RELIEVING TEMPERATURE	DEG C	170		
OPERATING PRESSURE	KG/CM2 G	13.5		
SET PRESSURE	KG/CM2 G	22		
MAXIMUM BACK PRESSURE	KG/CM2 G	0.5		
BACK PRESSURE CONSTANT/VARIABLE		VARIABLE		
% OVER PRESSURE		10		
BASIS OF SELECTION		Liquid thermal relief		
VALVE DISCHARGE TO		Close Blow down sump		
DATA AT SV INLET				
REQUIRED DISCHARGE CAPACITY	m3/hr	Nominal(Note-1)		
LIQUID		Sour water(H2S=1.34%(wt))		
VAPOUR / GAS				
LIQUID PROPERTIES @ REL. TEMP.				
DENSITY	KG/M3	850		
VISCOSITY	CP	0.15		
GAS AND VAPOUR PROPERTIES				
MOLECULAR WEIGHT		NA		
COMPRESSIBILITY FACTOR		NA		
Cp/Cv				
INLET CONNECTION SIZE&RATING		3/4" Flange 300#		

OUTLET CONNECTION SIZE&RATING			1" Flange 150#		
NOTES:					
1.To be confirmed during detail design/engineering					
0	03.05.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

PROCESS DATA SHEET		NUMALIGARH REFINERY LTD		
		TECHNICAL SERVICE		
		PROCESS TECHNOLOGY		
Job No.	Proccurment of PSV(New)			
Job Description	Proccurment of PSV(New)		Rev. No.	0
Unit	SWSU			
Tag No	08-PSV-1014(PTHE)			
Service	Sour water			
Location	At O/L of 08-EE-008			
FLUID				
FLUID STATE @ SV INLET				
OPERATING TEMPERATURE	DEG C	96		
RELIEVING TEMPERATURE	DEG C	110		
OPERATING PRESSURE	KG/CM2 G	15.5		
SET PRESSURE	KG/CM2 G	22		
MAXIMUM BACK PRESSURE	KG/CM2 G	0.5		
BACK PRESSURE CONSTANT/VARIABLE		VARIABLE		
% OVER PRESSURE		10		
BASIS OF SELECTION		Liquid thermal relief		
VALVE DISCHARGE TO		Close Blow down sump		
DATA AT SV INLET				
REQUIRED DISCHARGE CAPACITY	m3/hr	Nominal(Note-1)		
LIQUID		Sour water(H2S=1.34%(wt))		
VAPOUR / GAS				
LIQUID PROPERTIES @ REL. TEMP.				
DENSITY	KG/M3	950		
VISCOSITY	CP	0.27		
GAS AND VAPOUR PROPERTIES				
MOLECULAR WEIGHT				
COMPRESSIBILITY FACTOR				
Cp/Cv				
INLET CONNECTION SIZE&RATING		3/4" Flange 300#		

OUTLET CONNECTION SIZE&RATING			1" Flange 150#		
NOTES:					
1.To be confirmed during detail design/engineering					
0	03.05.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

PROCESS DATA SHEET		NUMALIGARH REFINERY LTD		
		TECHNICAL SERVICE		
		PROCESS TECHNOLOGY		
Job No.	Proccurment of PSV(New)			
Job Description	Proccurment of PSV(New)		Rev. No.	0
Unit	ARU			
Tag No	11-TSV-1301(PTHE)			
Service	Amine			
Location	At outlet of 11-EE-005 Regenarator			
FLUID				
FLUID STATE @ SV INLET		Liquid		
OPERATING TEMPERATURE(Max)	DEG C	114.3		
RELIEVING TEMPERATURE	DEG C	122		
OPERATING PRESSURE(Max)	KG/CM2 G	5.2		
SET PRESSURE	KG/CM2 G	11		
MAXIMUM BACK PRESSURE	KG/CM2 G	0.5		
BACK PRESSURE CONSTANT/VARIABLE		VARIABLE		
% OVER PRESSURE		10		
BASIS OF SELECTION		Liquid thermal relief		
VALVE DISCHARGE TO		Amine Blow down sump		
DATA AT SV INLET				
REQUIRED DISCHARGE CAPACITY	m3/hr	Nominal(Note-1)		
LIQUID		Amine(MDEA)		
VAPOUR / GAS				
LIQUID PROPERTIES @ REL. TEMP.				
DENSITY	KG/M3	950		
VISCOSITY	CP	0.3		
GAS AND VAPOUR PROPERTIES				
MOLECULAR WEIGHT				
COMPRESSIBILITY FACTOR				
Cp/Cv				
INLET CONNECTION SIZE&RATING		3/4" Flange 150#		

OUTLET CONNECTION SIZE&RATING			1" Flange 150#		
NOTES:					
1.To be confirmed during detail design/engineering					
0	03.05.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

21-TSV-1357 Data Sheet

Pressione di taratura / Set pressure	PSET	9	kg/cm² g
Contropressione imposta / Superimposed backpressure	CPR_s	0	kg/cm² g
Contropressione max totale/ Max total backpressure	CPR_tot	0	kg/cm² g
Pressione di prova a banco / Cold diff. test pres.	CDTP	9	kg/cm² g
Temperatura di scatto / Relieving temperature	T	65	°C
Sovrappressione / Overpressure	a	10	%
Coefficiente efflusso GAS / Discharge coefficient	Kd	-	-
Coefficiente efflusso LIQ / Discharge coefficient	Kd	0,777	-
Fatt. corr. contropress. / Backpressure corr. Factor	Kw	1,000	-

DATI DEL PROCESSO / PROCESS CONDITION

Fluido scaricato / Discharged fluid		WATER	LIQ
Portata di scarico richiesta / Required discharge capacity	Q	6	m³/h
Peso molecolare / Molecular weight	M	-	kg/kmole
Rapporto calori specifici / Specific heat ratio	k	-	-
Fattore di comprimibilità / Compressibility factor	Z	-	-
Densità relativa / Specific gravity	G1	1,000	
Volume specifico / Specific volume	v	-	m³/kg
Viscosità / Viscosity	μ	0,200	cPs

DIMENSIONAMENTO E SELEZIONE VALVOLA / VALVE SIZING AND SELECTION

Norme di calcolo / Sizing Standard	-	ASME VIII	S.I. Unit
Portata di scarico richiesta / Required discharge capacity	Q	6000,0	kg/h
Pressione di scarico / Relieving pressure	P1	1072,2	kPa_a
Contropressione totale / Total backpressure	P2	101,3	kPa_a
Temperatura di scarico / Relieving temperature	T	338,2	°K
Coefficiente di espansione / Expansion coefficient	C	-	-
Coeff. d'efflusso corr. / Corr. disch. coefficient	K	0,699	-
Fatt. corr. disco di rottura / Combination factor	Kc	1,000	-
Fatt. corr. per efflusso subcritico / Subcritical factor	F2	-	-
Fatt. corr. di Napier / Napier corr. factor.	Kn	-	-
Fatt. corr. vapore surr. / Superheat steam corr. factor	Ksh	-	-
Fatt. vapore supercritico / Supercritical steam factor	Ksc	-	-
Fatt. corr. viscosità / Viscosity corr. factor	Kv	1	-
Fattore ASME I vapore / Steam factor ASME I	Cn	-	-
Frazione secca del vapore / Dryness fraction for steam	x	-	%

K = 0,9 x Kd

Reynold's Number = 1000015,7

Medium: LIQ

Equation: API 520 Ed. 2008
Liquid flow

$$A = \frac{11,78 \times Q}{0,9 K_D K_C K_W K_V} \sqrt{\frac{G_1}{P_1 - P_2}}$$

Area richiesta / Required area	Ar	0,541	cm²
Orifizio scelto / Selected orifice	-	D1	
Area scelta / Selected area	As	0,882	cm²
Portata massima / Max discharge capacity	Q_max	9,79	m³/h
Capacità certificata / Certified capacity	Ww	163,19	l/min

CALCOLO RUMOROSITA' / NOISE LEVEL

Velocità del suono / Sound speed	Vs	-	m/s
Livello di rumore / Noise level	L	-	dB at 30m

Ref. standards: API-521-ISO 23251

Not applicable for liquid flow

CALCOLO FORZA DI REAZIONE / REACTION FORCE CALCULATION

Diametro interno conn.uscita / Outlet internal Ø	D	50	mm
Sezione di uscita / Outlet area	Ao	1963,5	mm²
Temperatura di scarico / Relieving temperature	Ts	65,0	°C
Forza di reazione / Reaction force	F	4,7	N

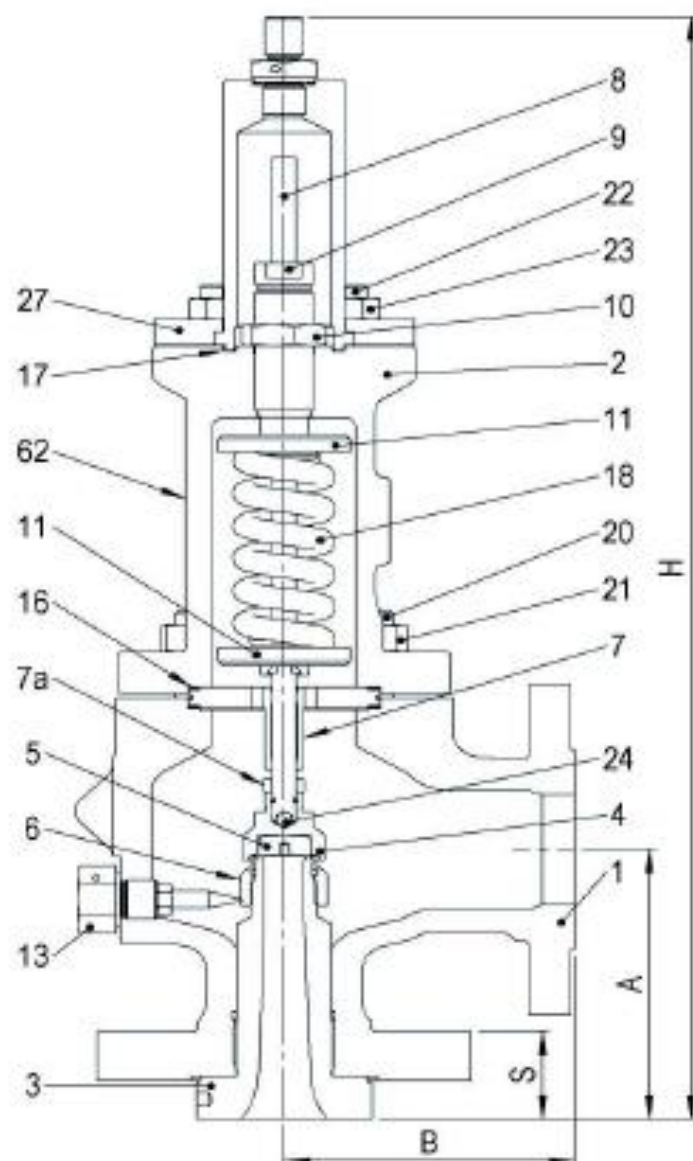
Reference Standard:

Gas & steam flow: API-520 Part II

Liquid flow: EN-ISO 4126-9

1-

Per orifizi D1 a H / From orifice D1 to H



PRESSURE RELIEF VALVE DATA SHEET

VALVE TAG NO : **34-PSV-728 (N)**
 STANDARD : **ASME SEC VIII , API (520, 527)**
 INLET & OUTLET SIZE : **1.5" & 2"**
 QUANTITY (NOS.) : **1**
 UNIT NAME: **CPP**
 SERVICE: **BOILER FEED WATER (BFW)**
 FLUID STATE: **LIQUID**
 eMOC NO : **MOC-P&U-2018-639**

PIPING CLASS : **D2A**
 RATING : **600 #**
 ENDS : **FLGD TO B16.5 RF**
 OPERATING PRESS. (KG/CM2 G): **40**
 OPERATING TEMP. (C): **105**
 BACK PRESS. (KG/CM2 G): **ATM**
 PSV SET PRESS. (KG/CM2 G): **45**
 ALLOWABLE OVER PRESS. (%): **10**
 PSV's FLOW RATE (M3/HR) : **10**

VALVE DESCRIPTION	MATERIAL
BODY	ASTM A216 GR WCB
NOZZLE	ASTM A351 CF8M
DISC ASSEMBLY	SS316
SPINDLE GUIDE	ASTM A 216 Gr, WCB
GUIDE INSERT	SS316
BONNET	ASTM A 216 Gr, WCB
SPINDLE	SS316
SPLIT RING	SS316
SPRING PLATE	SS316
ADH. SCREW	SS316
LOCK NUT	SS316
CAP	ASTM A 216 Gr, WCB
SPRING	High tem alloy steel to DIN 1.8159
ROLL PIN	SS
SECURING RING	SS
GASKET	NON ASBESTOS (AF 154)
BALL	SS316
TEST GAG	CS

NOTES:

1. THIS VALVE SPEC. SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES.
2. BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR WHEREVER BIDDER AGREES WITH SPEC. BIDDER SHALL INDICATE "AGREED".
3. NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC. IS ALLOWED.
4. TESTING SHALL BE DONE AS PER ASME & API.

5. VENDOR SHALL CONFIRM THE MATERIAL SUITABILITY FOR DESIGN TEMPERATURE (200 DEG. C).
6. IBR CERTIFICATE WITH FORM IIIC SHALL BE PROVIDED.
7. VALVE LEAKAGE AS PER API 527.
8. EACH VALVE IS WITH SS TAG PLATE WITH FOLLOWING INFORMATION:-
 A)TAG NUMBER, B)MANF. MAKE & MODEL, C)VALVE SERIAL NO
 D) BODY MATERIAL, E) SPRING MATERIAL, F) SET PRESSURE
9. VALVE ACCESSORIES WILL BE WITH VALVE.
10. VENDOR HAS TO COMPLETE AND SUBMIT THE PSV DATA SHEET AS PER API STD.



NUMALIGARH REFINERY LTD.
DIST : GOLAGHAT. ASSAM.

**SPECIFICATION
 FOR
 PRESSURE RELIEF VALVE**

REV	DATE	REVISIONS
0	12-09-19	ISSUED FOR BIDS

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PROCESS DATA SHEET		NUMALIGARH REFINERY LTD		
		TECHNICAL SERVICE		
		PROCESS TECHNOLOGY		
Job No.	New Proccurment			
Job Description :	New Proccurment		Rev. No. 0	0
UNIT	P&U			
TAG NO.	PSV-1163/1164/2163/2164			
SERVICE	Protection of NG conditioning skid			
LOCATION	PCV downsteram reduing line			
FLUID				
FLUID STATE @ SV INLET		Gas		
OPERATING TEMPERATURE	DEG C	40		
RELIEVING TEMPERATURE	DEG C	60		
OPERATING PRESSURE	KG/CM2 G	21		
SET PRESSURE	KG/CM2 G	24		
MAXIMUM BACK PRESSURE	KG/CM2 G	2.34		
BACK PRESSURE CONSTANT/VARIABLE		VARIABLE		
% OVER PRESSURE		10		
BASIS OF SELECTION		PCV Failure		
VALVE DISCHARGE TO		Flare header		
DATA AT SV INLET				
REQUIRED DISCHARGE CAPACITY	Nm3/hr	14363(Noet-1)		
LIQUID				
VAPOUR / GAS		Natural Gas(NG)		
LIQUID PROPERTIES @ REL. TEMP.		NA		
DENSITY	KG/M3	NA		
VISCOSITY	CP	NA		
GAS AND VAPOUR PROPERTIES				
MOLECULAR WEIGHT		16.3		
COMPRESSIBILITY FACTOR		0.97		
Cp/Cv		1.3		
INLET CONNECTION SIZE&RATING		2.5" Flange 300#		
OUTLET CONNECTION SIZE&RATING		4" Flange 150#		

Note:					
1.To be confirmed during detail design/engineering					
0	26.04.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

OUTLET CONNECTION SIZE&RATING			2" Flange 150#		
NOTES:					
1.To be confirmed during detail design/engineering					
0	26.04.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

40-TSV-1102

06/25/01

Safety Valve Data Sheet of Offsite & Utility

<i>Information</i>	<i>Operating Condition</i>	<i>Material Of Construction</i>
Tag No: 40-TSV-1102	Set pressure kg/cm2 g 34.0	Material Nozzle & disc SS 316
Vessel: -----	CBSP kg/cm2 g 34.34	
Line No: 12"-P-40-1122-B1A-IT	Back pressure kg/cm2 g : ATM	Material body & Bonnet ASTM A 105
Service: CRUDE	Operating pressure kg/cm2 g : 27.0	
Inlet: 0.75"NPTM	Operating temperature deg C : 40	Material spring : CD Plated CS
Outlet: 1"NPTF	Rel.Temperature deg C 160	
Fluid State: LIQUID	Over pressure kg/cm2 g : 25	Material bellows : -----

44-TSV-1301

06/25/01

Safety Valve Data Sheet of Offsite & Utility

Information

Tag No: 44-TSV-1301
Vessel: -----
Line No: 6"-P-44-1316-A10A
Service: ATF
Inlet: 0.75"NPTM
Outlet: 1"NPTF
Fluid State: LIQUID

Operating Condition

Set pressure kg/cm² g 9.0
CBSP kg/cm² g 9.0
Back pressure kg/cm² g : ATM
Operating pressure kg/cm² g : 5.0
Operating temperature deg C : AMB
Rel. Temperature deg C 65
Over pressure kg/cm² g : 25

Material Of Construction

Material Nozzle & disc : SS 316
Material body & Bonnet : STM A 105
Material spring : CD Plated CS
Material bellow : -----

44-TSV-1302

06/25/01

Safety Valve Data Sheet of Offsite & Utility

<i>Information</i>	<i>Operating Condition</i>	<i>Material Of Construction</i>
Tag No: 44-TSV-1302	Set pressure kg/cm2 g 18	Material Nozzle & disc : SS 316
Vessel:	CBSP kg/cm2 g	
Line No: 3"-P-44-1301-A10A	Back pressure kg/cm2 g : ATM	Material body & Bonnet : STM A 105
Service: ATF	Operating pressure kg/cm2 g : 4.0	
Inlet: 0.75"NPTM	Operating temperature deg C : AMB	Material spring : CD Plated CS
Outlet: 1"NPTF	Rel.Temperature deg C 65	
Fluid State: LIQUID	Over pressure kg/cm2 g : 25	Material bellows :

44-TSV-1801

06/25/01

Safety Valve Data Sheet of Offsite & Utility

<u>Information</u>	<u>Operating Condition</u>	<u>Material Of Construction</u>
Tag No: 44-TSV-1801	Set pressure kg/cm2 g 9.0	Material Nozzle & disc : SS 316
Vessel: -----	CBSP kg/cm2 g 9.09	
Line No: 8"-P-44-1801-A10A-IT	Back pressure kg/cm2 g : ATM	Material body & Bonnet : ASTM A 105
Service: FUEL OIL	Operating pressure kg/cm2 g : 7.0	
Inlet: 0.75"NPTM	Operating temperature deg C : 90.0	Material spring : CD Plated CS
Outlet: 1"NPTF	Rel.Temperature deg C 160	
Fluid State: LIQUID	Over pressure kg/cm2 g : 25	Material bellow : -----

TSV Specification

Job name : MS road loading capacity enhancement at NRMT

MOC no : MOC-NRMT-2018-0610

Tag No : 45-TSV-2211

Items	Data	Items	Data
Inlet Size	0.75" NPTM	Op. pres. (Kg/cm ² g)	9
Outlet size	1" NPTF	Op. Temp.	40
Mat. Bonnet	ASTM A 105	Back pres. (kg/cm ² g)	ATM
Mat. Body	SS 316	Set. Pres (Kg/cm ² g)	15
Mat. Spring	CD PLATED CS	CDSP (Kg/cm ² g)	15
Fluid state	LIQUID	Over pres. (%)	25
Code	API	Flow (M3/hr)	8
Service	Motor Spirit		

PROCESS DATA SHEET		NUMALIGARH REFINERY LTD		
		TECHNICAL SERVICE		
		PROCESS TECHNOLOGY		
Job No.	Proccurment of TSV(New)			
Job Description	Proccurment of TSV(New)		Rev. No.	0
Unit	OMS			
Tag No	44-TSV-3301			
Service	Naphtha			
Location	Naphtha to NRMT			
FLUID				
FLUID STATE @ SV INLET			Liquid	
OPERATING TEMPERATURE(Max)	DEG C	45		
RELIEVING TEMPERATURE	DEG C	65		
OPERATING PRESSURE(Max)	KG/CM2 G	5.5		
SET PRESSURE	KG/CM2 G	9 (Note-1)		
MAXIMUM BACK PRESSURE	KG/CM2 G	ATM		
BACK PRESSURE CONSTANT/VARIABLE		CONSTANT		
% OVER PRESSURE		10		
BASIS OF SELECTION		Liquid thermal relief		
VALVE DISCHARGE TO		OWS		
DATA AT SV INLET				
REQUIRED DISCHARGE CAPACITY	m3/hr	Nominal		
LIQUID		Naphtha		
VAPOUR / GAS				
LIQUID PROPERTIES @ REL. TEMP.				
DENSITY	KG/M3	704-750 @ opearting temp.		
VISCOSITY	Cst	0.43		
GAS AND VAPOUR PROPERTIES				
MOLECULAR WEIGHT				
COMPRESSIBILITY FACTOR				
Cp/Cv				
INLET CONNECTION SIZE&RATING				

OUTLET CONNECTION SIZE&RATING					
NOTES:					
1.To be confirmed during detail design/engineering					
0	22.07.2021	NEW DATA SHEET	SRB		
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

PRESSURE RELIEF VALVE DATA SHEET

VALVE TAG NO : 04-TSV-0403B
 STANDARD : ASME SEC VIII , API (520, 527)
 INLET & OUTLET SIZE : 0.5Inch 150# rating flange
 QUANTITY (NOS.) : 1
 UNIT NAME: HCU
 SERVICE: COOLING WATER RETURN
 FLUID STATE: LIQUID
 eMOC NO :

PIPING CLASS : A3A
 RATING : 150#
 ENDS : FLGD TO B16.5 RF
 OPERATING PRESS. (KG/CM2 G): 4
 OPERATING TEMP. (C): 45
 BACK PRESS. (KG/CM2 G): ATM
 PSV SET PRESS. (KG/CM2 G): 7
 ALLOWABLE OVER PRESS. (%): 10
 PSV's FLOW RATE (M3/HR) :

VALVE DESCRIPTION	MATERIAL
BODY	ASTM A216 GR WCB
NOZZLE	ASTM A351 CF8M
DISC ASSEMBLY	SS316
SPINDLE GUIDE	ASTM A 216 Gr, WCB
GUIDE INSERT	SS316
BONNET	ASTM A 216 Gr, WCB
SPINDLE	SS316
SPLIT RING	SS316
SPRING PLATE	SS316
ADH. SCREW	SS316
LOCK NUT	SS316
CAP	ASTM A 216 Gr, WCB
SPRING	High tem allowy steel to DIN 1.8159
ROLL PIN	SS
SECURING RING	SS
GASKET	NON ASBESTOS (AF 154)
BALL	SS316
TEST GAG	CS

NOTES:

1. THIS VALVE SPEC. SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES.
2. BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR WHEREVER BIDDER AGREES WITH SPEC. BIDDER SHALL INDICATE "AGREED".
3. NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC. IS ALLOWED.
4. TESTING SHALL BE DONE AS PER ASME & API.

5. VENDOR SHALL CONFIRM THE MATERIAL SUITABILITY FOR DESIGN TEMPERATURE (200 DEG. C).
7. VALVE LEAKAGE AS PER API 527.
8. EACH VALVE IS WITH SS TAG PLATE WITH FOLLOWING INFORMATION:-
 A)TAG NUMBER, B)MANF. MAKE & MODEL, C)VALVE SERIAL NO
 D) BODY MATERIAL, E) SPRING MATERIAL, F) SET PRESSURE
9. VALVE ACCESSORIES WILL BE WITH VALVE.
10. VENDOR HAS TO COMPLETE AND SUBMIT THE PSV DATA SHEET AS PER API STD.



NUMALIGARH REFINERY LTD.
 DIST : GOLAGHAT. ASSAM.

SPECIFICATION FOR PRESSURE RELIEF VALVE

REV	DATE	REVISIONS
0	19-05-2021	ISSUED FOR BIDS

PRESSURE RELIEF VALVE DATA SHEET

VALVE TAG NO : 04-TSV-2108
 STANDARD : ASME SEC VIII , API (520, 527)
 INLET & OUTLET SIZE : Threaded 0.5"
 QUANTITY (NOS.) : 1
 UNIT NAME: HCU
 SERVICE: Cooling Water Return
 FLUID STATE: LIQUID
 eMOC NO :

PIPING CLASS : A3A
 RATING : 150 #
 ENDS : FLGD TO B16.5 RF
 OPERATING PRESS. (KG/CM2 G): 4
 OPERATING TEMP. (C): 45
 BACK PRESS. (KG/CM2 G): ATM
 PSV SET PRESS. (KG/CM2 G): 7
 ALLOWABLE OVER PRESS. (%): 10
 PSV's FLOW RATE (M3/HR) :

VALVE DESCRIPTION	MATERIAL
BODY	ASTM A216 GR WCB
NOZZLE	ASTM A351 CF8M
DISC ASSEMBLY	SS316
SPINDLE GUIDE	ASTM A 216 Gr, WCB
GUIDE INSERT	SS316
BONNET	ASTM A 216 Gr, WCB
SPINDLE	SS316
SPLIT RING	SS316
SPRING PLATE	SS316
ADH. SCREW	SS316
LOCK NUT	SS316
CAP	ASTM A 216 Gr, WCB
SPRING	High tem alloy steel to DIN 1.8159
ROLL PIN	SS
SECURING RING	SS
GASKET	NON ASBESTOS (AF 154)
BALL	SS316
TEST GAG	CS

NOTES:

1. THIS VALVE SPEC. SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES.
2. BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR WHEREVER BIDDER AGREES WITH SPEC. BIDDER SHALL INDICATE "AGREED".
3. NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC. IS ALLOWED.
4. TESTING SHALL BE DONE AS PER ASME & API.

5. VENDOR SHALL CONFIRM THE MATERIAL SUITABILITY FOR DESIGN TEMPERATURE (200 DEG. C).
7. VALVE LEAKAGE AS PER API 527.
8. EACH VALVE IS WITH SS TAG PLATE WITH FOLLOWING INFORMATION:-
 A)TAG NUMBER, B)MANF. MAKE & MODEL, C)VALVE SERIAL NO
 D) BODY MATERIAL, E) SPRING MATERIAL, F) SET PRESSURE
9. VALVE ACCESSORIES WILL BE WITH VALVE.
10. VENDOR HAS TO COMPLETE AND SUBMIT THE PSV DATA SHEET AS PER API STD.



NUMALIGARH REFINERY LTD.
 DIST : GOLAGHAT. ASSAM.

**SPECIFICATION
 FOR
 PRESSURE RELIEF VALVE**

REV	DATE	REVISIONS
0	19-05-2021	ISSUED FOR BIDS

PRESSURE RELIEF VALVE DATA SHEET

VALVE TAG NO : 04-TSV-403D

STANDARD : ASME SEC VIII , API (520, 527)

INLET & OUTLET SIZE : 0.5Inch 150# rating flange

QUANTITY (NOS.) : 1

UNIT NAME: HCU

SERVICE: COOLING WATER RETURN

FLUID STATE: **LIQUID**

eMOC NO :

PIPING CLASS : A3A

RATING : 150#

ENDS : FLGD TO B16.5 RF

OPERATING PRESS. (KG/CM2 G): 4

OPERATING TEMP. (C): 45

BACK PRESS. (KG/CM2 G): **ATM**

PSV SET PRESS. (KG/CM2 G): 7

ALLOWABLE OVER PRESS. (%): 10

PSV's FLOW RATE (M3/HR) :

VALVE DESCRIPTION	MATERIAL	
BODY	ASTM A216 GR WCB	
NOZZLE	ASTM A351 CF8M	
DISC ASSEMBLY	SS316	
SPINDLE GUIDE	ASTM A 216 Gr. WCB	
GUIDE INSERT	SS316	
BONNET	ASTM A 216 Gr. WCB	
SPINDLE	SS316	
SPLIT RING	SS316	
SPRING PLATE	SS316	
ADH. SCREW	SS316	
LOCK NUT	SS316	
CAP	ASTM A 216 Gr. WCB	
SPRING	High tem allowy steel to DIN 1.8159	
ROLL PIN	SS	
SECURING RING	SS	
GASKET	NON ASBESTOS (AF 154)	
BALL	SS316	
TEST GAG	CS	

NOTES:

1. THIS VALVE SPEC. SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES.
2. BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR WHEREVER BIDDER AGREES WITH SPEC. BIDDER SHALL INDICATE "AGREED".
3. NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC. IS ALLOWED.
4. TESTING SHALL BE DONE AS PER ASME & API.

5. VENDOR SHALL CONFIRM THE MATERIAL SUITABILITY FOR DESIGN TEMPERATURE (200 DEG. C).
7. VALVE LEAKAGE AS PER API 527.
8. EACH VALVE IS WITH SS TAG PLATE WITH FOLLOWING INFORMATION:-
A)TAG NUMBER, B)MANF. MAKE & MODEL, C)VALVE SERIAL NO
D) BODY MATERIAL, E) SPRING MATERIAL, F) SET PRESSURE
9. VALVE ACCESSORIES WILL BE WITH VALVE.
10. VENDOR HAS TO COMPLETE AND SUBMIT THE PSV DATA SHEET AS PER API STD.



NUMALIGARH REFINERY LTD.
DIST : GOLAGHAT. ASSAM.

SPECIFICATION FOR PRESSURE RELIEF VALVE

REV	DATE	REVISIONS
0	19-05-2021	ISSUED FOR BIDS

PRESSURE RELIEF VALVE DATA SHEET

VALVE TAG NO : 04-TSV-2208
 STANDARD : ASME SEC VIII , API (520, 527)
 INLET & OUTLET SIZE : Threaded 0.5"
 QUANTITY (NOS.) : 1
 UNIT NAME: HCU
 SERVICE: COOLING WATER RETURN
 FLUID STATE: LIQUID
 eMOC NO :

PIPING CLASS : A3A
 RATING : 150#
 ENDS : FLGD TO B16.5 RF
 OPERATING PRESS. (KG/CM2 G): 4
 OPERATING TEMP. (C): 45
 BACK PRESS. (KG/CM2 G): ATM
 PSV SET PRESS. (KG/CM2 G): 7
 ALLOWABLE OVER PRESS. (%): 10
 PSV's FLOW RATE (M3/HR) :

VALVE DESCRIPTION	MATERIAL
BODY	ASTM A216 GR WCB
NOZZLE	ASTM A351 CF8M
DISC ASSEMBLY	SS316
SPINDLE GUIDE	ASTM A 216 Gr, WCB
GUIDE INSERT	SS316
BONNET	ASTM A 216 Gr, WCB
SPINDLE	SS316
SPLIT RING	SS316
SPRING PLATE	SS316
ADH. SCREW	SS316
LOCK NUT	SS316
CAP	ASTM A 216 Gr, WCB
SPRING	High tem alloy steel to DIN 1.8159
ROLL PIN	SS
SECURING RING	SS
GASKET	NON ASBESTOS (AF 154)
BALL	SS316
TEST GAG	CS

NOTES:

1. THIS VALVE SPEC. SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES.
2. BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR WHEREVER BIDDER AGREES WITH SPEC. BIDDER SHALL INDICATE "AGREED".
3. NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC. IS ALLOWED.
4. TESTING SHALL BE DONE AS PER ASME & API.

5. VENDOR SHALL CONFIRM THE MATERIAL SUITABILITY FOR DESIGN TEMPERATURE (200 DEG. C).
7. VALVE LEAKAGE AS PER API 527.
8. EACH VALVE IS WITH SS TAG PLATE WITH FOLLOWING INFORMATION:-
 A)TAG NUMBER, B)MANF. MAKE & MODEL, C)VALVE SERIAL NO
 D) BODY MATERIAL, E) SPRING MATERIAL, F) SET PRESSURE
9. VALVE ACCESSORIES WILL BE WITH VALVE.
10. VENDOR HAS TO COMPLETE AND SUBMIT THE PSV DATA SHEET AS PER API STD.



NUMALIGARH REFINERY LTD.
 DIST : GOLAGHAT. ASSAM.

**SPECIFICATION
 FOR
 PRESSURE RELIEF VALVE**

REV	DATE	REVISIONS
0	19-05-2021	ISSUED FOR BIDS

PRESSURE RELIEF VALVE DATA SHEET

VALVE TAG NO : 04-TSV-2308
 STANDARD : ASME SEC VIII , API (520, 527)
 INLET & OUTLET SIZE : Threaded 0.5"
 QUANTITY (NOS.) : 1
 UNIT NAME: HCU
 SERVICE: COOLING WATER RETURN
 FLUID STATE: LIQUID
 eMOC NO :

PIPING CLASS : A3A
 RATING : 150#
 ENDS : FLGD TO B16.5 RF
 OPERATING PRESS. (KG/CM2 G): 4
 OPERATING TEMP. (C): 45
 BACK PRESS. (KG/CM2 G): ATM
 PSV SET PRESS. (KG/CM2 G): 7
 ALLOWABLE OVER PRESS. (%): 10
 PSV's FLOW RATE (M3/HR) :

VALVE DESCRIPTION	MATERIAL
BODY	ASTM A216 GR WCB
NOZZLE	ASTM A351 CF8M
DISC ASSEMBLY	SS316
SPINDLE GUIDE	ASTM A 216 Gr, WCB
GUIDE INSERT	SS316
BONNET	ASTM A 216 Gr, WCB
SPINDLE	SS316
SPLIT RING	SS316
SPRING PLATE	SS316
ADH. SCREW	SS316
LOCK NUT	SS316
CAP	ASTM A 216 Gr, WCB
SPRING	High tem alloy steel to DIN 1.8159
ROLL PIN	SS
SECURING RING	SS
GASKET	NON ASBESTOS (AF 154)
BALL	SS316
TEST GAG	CS

NOTES: 1. THIS VALVE SPEC. SHEET SHALL BE READ IN CONJUNCTION WITH TECHNICAL NOTES FOR VALVES. 2. BIDDER SHALL CLEARLY WRITE ALL/ ANY DEVIATION AGAINST EACH PART/ MATERIAL OF VALVE IN THE SPACE PROVIDED FOR WHEREVER BIDDER AGREES WITH SPEC. BIDDER SHALL INDICATE "AGREED". 3. NO CUTTING/ OVERWRITING BY BIDDER ON EIL'S SPEC. IS ALLOWED. 4. TESTING SHALL BE DONE AS PER ASME & API.	5. VENDOR SHALL CONFIRM THE MATERIAL SUITABILITY FOR DESIGN TEMPERATURE (200 DEG. C). 7. VALVE LEAKAGE AS PER API 527. 8. EACH VALVE IS WITH SS TAG PLATE WITH FOLLOWING INFORMATION:- A)TAG NUMBER, B)MANF. MAKE & MODEL, C)VALVE SERIAL NO D) BODY MATERIAL, E) SPRING MATERIAL, F) SET PRESSURE 9. VALVE ACCESSORIES WILL BE WITH VALVE. 10. VENDOR HAS TO COMPLETE AND SUBMIT THE PSV DATA SHEET AS PER API STD.
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 NUMALIGARH REFINERY LTD. DIST : GOLAGHAT. ASSAM.	SPECIFICATION FOR PRESSURE RELIEF VALVE	REV	DATE	REVISIONS
		0	19-05-2021	ISSUED FOR BIDS

PROCESS DATA SHEET		NUMALIGARH REFINERY LTD			
		TECHNICAL SERVICE			
		PROCESS TECHNOLOGY			
Job No.	Proccurment of PSV				
Job Description	Proccurment of PSV		Rev. No.	0	
Unit	P&U				
Tag No	PSV-1161/1162/2161/2162				
Service	Protection of NG conditioning skid				
Location	NG scrubber				
FLUID					
FLUID STATE @ SV INLET			Gas		
OPERATING TEMPERATURE		DEG C	38		
RELIEVING TEMPERATURE		DEG C	50		
OPERATING PRESSURE		KG/CM2 G	34		
SET PRESSURE		KG/CM2 G	39		
MAXIMUM BACK PRESSURE		KG/CM2 G	2.34		
BACK PRESSURE CONSTANT/VARIABLE			VARIABLE		
% OVER PRESSURE			10		
BASIS OF SELECTION			Fire		
VALVE DISCHARGE TO			Flare header		
DATA AT SV INLET					
REQUIRED DISCHARGE CAPACITY		Nm3/hr	14363(Noet-1)		
LIQUID					
VAPOUR / GAS			Natural Gss(NG)		
LIQUID PROPERTIES @ REL. TEMP.			NA		
DENSITY		KG/M3	NA		
VISCOSITY		CP	NA		
GAS AND VAPOUR PROPERTIES					
MOLECULAR WEIGHT			16.3		
COMPRESSIBILITY FACTOR			0.97		
Cp/Cv			1.3		
INLET CONNECTION SIZE&RATING			Flange size is to be finalized duirng detail design & 300#		
OUTLET CONNECTION SIZE&RATING			Flange size is to be finalized duirng detail design & 150#		
NOTES:					
1.To be confirmed during detail design/engineering					
0	03.05.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By

PROCESS DATA SHEET(PSV/TSV)		NUMALIGARH REFINERY LTD			
		TECHNICAL SERVICE			
		PROCESS TECHNOLOGY			
Job No.	Procurement of PSV				
Job Description	Procurement of PSV		Rev. No.	0	
Unit	P&U				
Tag No	PSV-1165/1166/2165/2166				
Service	Protection of NG conditioning skid				
Location	Heater				
FLUID					
FLUID STATE @ SV INLET			Gas		
OPERATING TEMPERATURE	DEG C	38			
RELIEVING TEMPERATURE	DEG C	50			
OPERATING PRESSURE	KG/CM2 G	34			
SET PRESSURE	KG/CM2 G	39			
MAXIMUM BACK PRESSURE	KG/CM2 G	2.34			
BACK PRESSURE CONSTANT/VARIABLE		VARIABLE			
% OVER PRESSURE		10			
BASIS OF SELECTION		Fire			
VALVE DISCHARGE TO		Flare header			
DATA AT SV INLET					
REQUIRED DISCHARGE CAPACITY	Nm3/hr	14363(Note-1)			
LIQUID					
VAPOUR / GAS		Natural Gas(NG)			
LIQUID PROPERTIES @ REL. TEMP.		NA			
DENSITY	KG/M3	NA			
VISCOSITY	CP	NA			
GAS AND VAPOUR PROPERTIES					
MOLECULAR WEIGHT		16.3			
COMPRESSIBILITY FACTOR		0.97			
Cp/Cv		1.3			
INLET CONNECTION SIZE&RATING		Flange size is to be finalized during detail design & 300#			
OUTLET CONNECTION SIZE&RATING		Flange size is to be finalized during detail design & 150#			
NOTES:					
1.To be confirmed during detail design/engineering					
0	26.04.2021	NEW DATA SHEET	GND	AC	AC
Rev. No.	Date	Purpose	Prepared By	Checked By	Approved By