





OWNER:  شرکت سست و سویی توسعه ایرانپترو (سهامی عامه)	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT						EPC CONTRACTOR:  Chagalesh-Enerchimi-Steam Joint Venture BUPC-MEG PLANT PROJECT		
	CALCULATION & DATA SHEET OF SAFETY VALVE FOR NITROGEN GAS BOOSTER								
MC :  شرکت سست و سویی توسعه ایرانپترو (سهامی عامه)	Project	Area	Phase	Unit	Dis.	Doc.	Seq.	Contract No : 52-98/445	
Owner Document Number: 17811-52A	BU	20	VD	303	IN	DSH	0015	Rev.:	Page
								01	1 of 7



Repeated Comment

- Required capacity for each PSV shall be specified by Airpack.
- PSVs pre-calculation shall be submitted by Airpack.

- Sub-vendor's calculation must be attached.
- VTA items to be specified in next rev.

This document must be consistent with the revised PID.



CALCULATION & DATA SHEET OF SAFETY VALVE FOR NITROGEN GAS BOOSTER

 شرکت سست و سویی توسعه ایرانپترو	 Chagalesh-Enerchimi-Steam Joint Venture BUPC-MEG PLANT PROJECT	BUSHEHR PETROCHEMICAL COMPANY MEG PLANT
Document Review		
Issue Purpose:	AFC	
Result Code: AP,AN,CM,RE,NC	AN	
Next Status : IFC,IFA,IFI,AFC,AB	AFC	
Responsible Department	MECHANICAL	
Commented Date	Nov/09/2021	
Approval or review hereunder shall not be construed to relieve Vendor / Subcontractor of his responsibilities and liability under the contract.		

		Approve For Construction				
01	27/10/2021	For approval	TvT	KP	LdM	
00	20/09/2021	For approval	TvT	KP	LdM	
Rev.	Date	Purpose of Issue	Prepared	Checked	Approved	AC Code
					Class: 1	Phase: P



INDEX			
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Notes:

				INSTRUMENT AND VALVE DATASHEET Index 	
01	TT	27-10-2021	For Approval		
00	TT	20-9-2021	For Approval	Sheet	3 of 7
Rev	By	Date	Description	Based on P&ID	Rev.A

GENERAL	1	Tag Number		PSV-10001	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		BU-20-VD-303-PR-WG-0013	
	4	Location		Compressor upstream After-cooler	
	5	Line/equip. No.		2"-NL-1002-539D(IN)	
	6	Design / nozzle type		Safety / Full	
	7	Conv., Bellows, Pilot op.		Conventional type	
	8	Bonnet Type /connection		Closed / bolted	
	9	Spring Cap /connection		Closed/ threaded	
PROCESS CONDITIONS	10	Fluid	State	Nitrogen	Dry Gas
	11	Pressure	Norm. Max.	14 Bar(a)	16 Bar(a)
	12	Temperature	Norm. Max.	160°C	170°C
	13	Design	Press. Temp.	21 Bar(a)	200°C
	14	Ambient Temp.	Min. Max.	5 °C	55 °C
BASIS AND SELECTION	15	Flow		707 Kg/hr / 565 Nm3/hr	
	16	Set Pressure		16 bar(g)	
	17	Molecular Weight	Oper. Sp. Gr.	28,97 kg/mol	1
	18	Back Pres. (bar(g))		0 bar(g)	
	19	Allowable Overpressure (%)		10 %	
	20	Compressibility Factor (Z)		1	
	21	Ratio of Specific Heat (Cp/Cv)		1.4	
	22	Operating Viscosity (cP)		-	
	23	Barometric Pressure		1,013	
	24	Max. Allowable Relief Pressure		18,613	
	25	Design Code		API 520, API 521, API 526	
	26	Size Basis		Blocked discharge	
	27	Calculated Area (sq.mm)		To be advised by supplier	
	28	Selected Area (sq.mm)		To be advised by supplier	
	29	Orifice Designation		To be advised by supplier	
CONNECTIONS	30				
	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	300#	150#
	34				
MATERIAL	35				
	36	Body and Bonnet		Carbon steel (SA-216 Gr. WCB)	
	37	Seat and Disc		To be advised by supplier	
	38	Guide and Rings		SS 316	
	39	Spring		Chrome Alloy / SS 316	
	40	Nozzle		To be advised by supplier	
OPTIONS	41	Bonnet Bolt/nut		A193 B7 / A194 grade 2H	
	42				
	43	Lever: Plain or Packed		Plain	
	44	Test Gag		Yes	
CERTIFICATES	45				
	46				
	47				
CALCULATIONS	48	3.1 Material certificate		Yes	
	49	Calibration certificate		Yes	
	50	Leakage test acc to API STD 527		Yes	
PURCHASE	51	Functional test		Yes	
	52	Sizing calculation		Yes	
	53				
PURCHASE	54				
	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
	57				

NOTES :

				INSTRUMENT AND VALVE DATASHEET			
				Pressure Safety Valve			
							
01	TT	27-10-2021	For Approval			Sheet 4 of 7	
00	TT	20-9-2021	For Approval			Based on P&ID Rev.A	
Rev	By	Date	Description				

GENERAL	1	Tag Number		PSV-10002	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		BU-20-VD-303-PR-WG-0013	
	4	Location		Compressor upstream After-cooler	
	5	Line/equip. No.		2"-NL-1003-539D(IN)	
	6	Design / nozzle type		Safety / Full	
	7	Conv., Bellows, Pilot op.		Conventional type	
	8	Bonnet Type /connection		Closed / bolted	
	9	Spring Cap /connection		Closed/ threaded	
PROCESS CONDITIONS	10	Fluid	State	Nitrogen	Dry Gas
	11	Pressure	Norm. Max.	23 Bar(a)	25 Bar(a)
	12	Temperature	Norm. Max.	135°C	140°C
	13	Design	Press. Temp.	25 Bar(a)	170°C
	14	Ambient Temp.	Min. Max.	5 °C	55 °C
BASIS AND SELECTION	15	Flow		707 Kg/hr / 565 Nm3/hr	
	16	Set Pressure		25 bar(g)	
	17	Molecular Weight	Oper. Sp. Gr.	28,97 kg/mol	1
	18	Back Pres. (bar(g))		0 bar(g)	
	19	Allowable Overpressure (%)		10 %	
	20	Compressibility Factor (Z)		1	
	21	Ratio of Specific Heat (Cp/Cv)		1.4	
	22	Operating Viscosity (cP)		-	
	23	Barometric Pressure		1,013	
	24	Max. Allowable Relief Pressure		28,513	
	25	Design Code		API 520, API 521, API 526	
	26	Size Basis		Blocked discharge	
	27	Calculated Area (sq.mm)		To be advised by supplier	
	28	Selected Area (sq.mm)		To be advised by supplier	
	29	Orifice Designation		To be advised by supplier	
CONNECTIONS	30				
	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	300#	150#
	34				
MATERIAL	35				
	36	Body and Bonnet		Carbon steel (SA-216 Gr. WCB)	
	37	Seat and Disc		To be advised by supplier	
	38	Guide and Rings		SS 316	
	39	Spring		Chrome Alloy / SS 316	
	40	Nozzle		To be advised by supplier	
	41	Bonnet Bolt/nut		A193 B7 / A194 grade 2H	
OPTIONS	42				
	43	Lever: Plain or Packed		Plain	
	44	Test Gag		Yes	
	45				
	46				
CERTIFICATES	47				
	48	3.1 Material certificate		Yes	
	49	Calibration certificate		Yes	
	50	Leakage test acc to API STD 527		Yes	
CALCULATIONS	51	Functional test		Yes	
	52	Sizing calculation		Yes	
	53				
PURCHASE	54				
	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
57					

NOTES :



				INSTRUMENT AND VALVE DATASHEET			
				Pressure Safety Valve			
01	TT	27-10-2021	For Approval				
00	TT	20-9-2021	For Approval				
Rev	By	Date	Description			Sheet	5 of 7
						Based on P&ID Rev.A	

100 oC. Must be consider for all cooling water lines

GENERAL	1	Tag Number		PSV-10003	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		BU-20-VD-303-PR-WG-0013	
	4	Location		Compressor Cooling water outlet	
	5	Line/equip. No.		2"-CWR-1011-501C(N)	
	6	Design / nozzle		Safety / Full	
	7	Conv., Bellows,		Conventional type	
	8	Bonnet Type /connection		Closed / bolted	
	9	Spring Cap /connection		Closed/ threaded	
PROCESS CONDITIONS	10	Fluid	State	Water	Liquid
	11	Pressure	Norm. Max.	2,5 Bar(g)	3 Bar(g)
	12	Temperature	Norm. Max.	45°C	55°C
	13	Design	Press. Temp.	5 Bar(g)	60°C
	14	Ambient Temp.	Min. Max.	5 °C	52 °C
BASIS AND SELECTION	15	Flow		14,5 m3/hr	
	16	Set Pressure		3,5 bar(g)	
	17	Molecular Weight	Oper. Sp. Gr.	18,015 g/mol	1
	18	Back Pres. (bar(g))		0 bar(g)	
	19	Allowable Overpressure (%)		10 %	
	20	Compressibility Factor (Z)		1	
	21	Ratio of Specific Heat (Cp/Cv)		1.4	
	22	Operating Viscosity (cP)		-	
	23	Barometric Pressure		1,013	
	24	Max. Allowable Relief Pressure		4,863	
	25	Design Code		API 520, API 521, API 526	
	26	Size Basis		Blocked discharge	
	27	Calculated Area (sq.mm)		To be advised by supplier	
	28	Selected Area (sq.mm)		To be advised by supplier	
	29	Orifice Designation		To be advised by supplier	
CONNECTIONS	30				
	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	150#	150#
	34				
MATERIAL	35				
	36	Body and Bonnet		Carbon steel (SA-216 Gr. WCB)	
	37	Seat and Disc		To be advised by supplier	
	38	Guide and Rings		SS 316	
	39	Spring		Chrome Alloy / SS 316	
	40	Nozzle		To be advised by supplier	
	41	Bonnet Bolt/nut		A193 B7 / A194 grade 2H	
OPTIONS	42				
	43	Lever: Plain or Packed		N/A	
	44	Test Gag		Yes	
	45				
	46				
CERTIFICATES	47				
	48	3.1 Material certificate		Yes	
	49	Calibration certificate		Yes	
	50	Leakage test acc to API STD 527		Yes	
CALCULATIONS	51	Functional test		Yes	
	52	Sizing calculation		Yes	
	53				
PURCHASE	54				
	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
57					



7 barg. Must be consider for all cooling water lines.

NOTES :

				INSTRUMENT AND VALVE DATASHEET		Pressure Safety Valve	
							
01	TT	27-10-2021	For Approval				
00	TT	20-9-2021	For Approval				
Rev	By	Date	Description	Sheet		6 of 7	
				Based on P&ID		Rev.A	

GENERAL	1	Tag Number	PSV-10001, PSV-10002, PSV-10003	
	2	Service	Pressure Safety Valve	
	3	P&ID No.	17811-03	
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	6	Calculations	VTA	
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				INSTRUMENT AND VALVE DATASHEET			
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00	TT	20-9-2021	For Approval				
Rev	By	Date	Description				