

OWNER:



**BUSHEHR PETROCHEMICAL COMPANY
MEG PLANT**

EPC CONTRACTOR:



MC :



**CALCULATION & DATA SHEET OF
SAFETY VALVE FOR EMERGENCY
INSTRUMENT AIR COMPRESSOR**





Owner Document Number: 17811-52B	Project	Area	Phase	Unit	Dis.	Doc.	Seq.	Contract No : 52-98/445	
	BU	20	VD	303	IN	DSH	0068	Rev.:	Page
								00	1 of 6

**CALCULATION & DATA SHEET OF SAFETY VALVE FOR EMERGENCY
INSTRUMENT AIR COMPRESSOR**

00	20/09/2021	For approval	TVt	KP	LdM	
Rev.	Date	Purpose of Issue	Prepared	Checked	Approved	AC Code
					Class: 1	Phase: P


INDEX			
No.	Device	Tag Number	Page
1	Pressure Safety Valve	PSV-71101	4
2	Pressure Safety Valve	PSV-71102	5
3	Pressure Safety Valve calculations	PSV-71101, PSV-71102	6
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			

Notes:

				INSTRUMENT AND VALVE DATASHEET Index			
							
00	TT	20/09/2021	For Approval			Sheet	3 of 6
Rev	By	Date	Description			Based on P&ID	Rev.02


GENERAL	1	Tag Number		PSV-71101	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		17811-03	
	4	Location		Compressor upstream After-cooler	
	5	Nozzle		Full nozzle	
	6	Design type		Safety	
	7	Conv., Bellows, Pilot op.		Conventional type	
	8	Bonnet Type		Open	
	9	Bonnet connection		Bolted	
PROCESS CONDITIONS	10	Fluid	State	Air	Dry Gas
	11	Pressure	Norm. Max.	21 Bar(a)	26 Bar(a)
	12	Temperature	Norm. Max.	180°C	195°C
	13	Design	Press. Temp.	26 Bar(a)	210°C
	14	Ambient Temp.	Min. Max.	5 °C	55 °C
	15	Flow		50 Kg/hr / 43 Nm3/hr	
BASIS AND SELECTION	16	Set Pressure		26 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		29,613	
	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	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	300#	150#
	34				
	35				
MATERIAL	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				
OPTIONS	43	Lever: Plain or Packed		N/A	
	44	Test Gag		N/A	
	45				
	46				
CERTIFICATES	48	3.1 Material certificate		Yes	
	49	Calibration certificate		Yes	
	50	Leakage test acc to API STD 527		Yes	
	51	Functional test		Yes	
CALCULATIONS	52	Sizing calculation		Yes	
	53				
	54				
PURCHASE	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
	57				

NOTES :

				INSTRUMENT AND VALVE DATASHEET	
				Pressure Safety Valve	
					
00	TT	20/09/2021	For Approval		Sheet 4 of 6
Rev	By	Date	Description		Based on P&ID Rev.02


GENERAL	1	Tag Number		PSV-71102	
	2	Service		Pressure Safety Valve	
	3	P&ID No.		17811-03	
	4	Location		Compressor Cooling water outlet	
	5	Nozzle		Full nozzle	
	6	Design type		Safety	
	7	Conv., Bellows, Pilot op.		Conventional type	
	8	Bonnet Type		Open	
	9	Bonnet connection		Bolted	
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	55 °C
	15	Flow		3,5 m3/hr	
BASIS AND SELECTION	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	31	Inlet Size	Outlet Size	1"	VTA
	32	Inlet Connection	Outlet Conn.	RF	RF
	33	Inlet Rating	Outlet Rating	150#	150#
	34				
	35				
MATERIAL	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				
	42				
OPTIONS	43	Lever: Plain or Packed		N/A	
	44	Test Gag		N/A	
	45				
	46				
	47				
CERTIFICATES	48	3.1 Material certificate		Yes	
	49	Calibration certificate		Yes	
	50	Leakage test acc to API STD 527		Yes	
	51	Functional test		Yes	
CALCULATIONS	52	Sizing calculation		Yes	
	53				
	54				
PURCHASE	55	Manufacturer		According to aproved vendor list	
	56	Model		Supplier to advise	
	57				

NOTES :

				INSTRUMENT AND VALVE DATASHEET	
				Pressure Safety Valve	
					
00	TT	20/09/2021	For Approval		Sheet 5 of 6
Rev	By	Date	Description		Based on P&ID Rev.02

GENERAL	1	Tag Number	PSV-10001, PSV-10002, PSV-10003	
	2	Service	Pressure Safety Valve	
	3	P&ID No.	17811-03	
	4			
	5			
	6	Calculations	VTA	
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20			
	21			
	22			
	23			
	24			
	25			
	26			
	27			
	28			
	29			
	30			
	31			
	32			
	33			
	34			
	35			
	36			
	37			
	38			
	39			
	40			
	41			
	42			
	43			
	44			
	45			
	46			
	47			
	48			
	49			
	50			
	51			
	52			
	53			
	54			
	55			
	56			
	57			

--	--	--	--

				INSTRUMENT AND VALVE DATASHEET	
					
00	TT	20/09/2021	For Approval	Sheet	6 of 6
Rev	By	Date	Description	Based on P&ID	Rev.A