

Pressure Safety & Relief Valve Specification and Calculation Sheet

Sheet No.	1 of 2	Rev . No	0
Project Name			
Project No.			
Date	2024-01-02	By	LeeJihan
Checked	NONE	Approved	NONE

GENERAL	P&ID No.	1	00251210DMDNEKC01(18 OF 22)				
	Tag No.	2	00251210 5200 PSV 174/176				
	Service Line	3	PRESSURE SAFETY VALVE				
	Model No.	4	JSV-FF100	Calculation			
	Quantity	5	5				
TYPE	Nozzle	6	Full Nozzle	Calculation of Area			
	Design Type	7	Conventional	$A1 = 11.78 * W1 * \sqrt{G / ((P * 1.1 - Pb)) / (Kd * Kb * Kc * Kv)}$ $= 11.78 * 0.133333 * \sqrt{1 / (750 * 1.1 - 0)} / (0.615 * 1 * 1 * 0.382)$ $= 0.232765 \text{ mm}^2$			
	Bonnet Type	8	Close				
	Lever Type	9	None				
	Cap Type	10	Screwed				
CONN	Size. Inlet / Outlet	11	1"X2"				
	Inlet. Rating / Facing	12	ASME CL150 RF				
	Outlet. Rating / Facing	13	ASME CL150 RF				
MATERIALS	Body (Base)	14	SA351 CF8M	Calculation of Capacity			
	Bonnet	15	SA351 CF8M	$W = A * Kd * Kb * Kc * Kv / (11.78 * \sqrt{G / ((P * 1.1 - Pb))})$ $= 132.9 * 0.615 * 1 * 1 * 0.382 / (11.78 * \sqrt{1 / (750 * 1.1 - 0)})$ $= 76.1 \text{ L/min}$ $= 4.6 \text{ m}^3/\text{h}$			
	Seat	16	316 SS-st.				
	Disc	17	316 SS-st.				
	Guide	18	316 SS				
	Gasket (Bonnet)	19	PTFE				
	Spring	20	Chrome Alloy(SWOSC-B) PK-ctd				
Bellows	21	None					
BASIS	Approved by	22	UV STAMP	W	Valve Capacity	76.1 L/min	
	Comply with NACE	23	-	W1	Required Capacity	0.133333 L/min	
	EN 10204	24	No	A1	Calculated Area	0.232765 mm ²	
	Code	25	API RP 520-Certification	A	Selected Area	132.9 mm ²	
	Fire	26	No	Kd	Coefficient of Discharge	0.615	
	Sizing Basis	27		P	Set Pressure	750 KPag	
	Rupture Disk	28	No	Kb	Correction Factor Due to Back Pressure	1	
SERVICE CONDITION	Fluid / State	29	SBS(NaHSO3)(30%)Dosing Pumps(L) / LIQUID	Kc	Correction Factor for a rupture disk	1	
	Mol. Weight / Specific Gravity	30	1	Kv	Correction Factor for Viscosity	0.382	
	Compressibility Factor	31	-	G	Specific gravity	1	
	Ratio of Specific Heat	32	-	Pb	Back Pressure	0 KPag	
	Viscosity	33	5 cP				
	Operating / Relieving Temp.	34	40 / 40 °C				
	Design Min. / Design Max. Temp.	35	- °C				
	Operating / Set Pressure	36	/ 7.5 barg				
	Design Pressure / C.D.T.P	37	- / 7.5 barg				
	Back Pressure	Superimposed - Constant	38	- barg			
		Superimposed - Variable	39	- barg			
		Built-up	40	- barg			
		Total	41	0 barg			
Allowable Overpressure	42	10 %					
Closing Pressure / Blowdown	43	Min. 5.625 barg / 25%					
SIZING & SELECTION	Required Capacity	44	0.008 m ³ /h	Remarks *Paint Color(*), *Painting system No.012 *Surface preparation : SSPC-SP1 - 1st. Epoxy primer(INTERGARD 251) 60 μm - 2nd. Epoxy undercoat (INTERGARD 475HS) GREY 150 μm - 3rd. Polyurethane topcoat (INTERTHANE 990) 70 μm Color : RAL 9006 Maker : International Paint			
	Valve Actual Capacity	45	4.6 m ³ /h				
	Calculated Orifice Area	46	0.232765 mm ²				
	Selected Orifice Area	47	132.9 mm ²				
	Orifice Dia.(mm)	48	D1(13)				
ETC	Paint System & Color	49	See Remark				
	Test Gag	50	No				
	Bug screen	51	No				

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GENERAL	P&ID No.	1	00251210DMDNEKC01(19 OF 22)				
	Tag No.	2	00251210 5200 PSV 178/180				
	Service Line	3	PRESSURE SAFETY VALVE				
	Model No.	4	JSV-FF100	Calculation			
	Quantity	5	5				
TYPE	Nozzle	6	Full Nozzle	Calculation of Area			
	Design Type	7	Conventional	$A1 = 11.78 * W1 * \sqrt{G / ((P * 1.1 - Pb)) / (Kd * Kb * Kc * Kv)}$ $= 11.78 * 0.5 * \sqrt{(1.1 / (750 * 1.1 - 0)) / (0.615 * 1 * 1 * 0.644)}$ $= 0.54303 \text{ mm}^2$			
	Bonnet Type	8	Close				
	Lever Type	9	None				
	Cap Type	10	Screwed				
CONN	Size. Inlet / Outlet	11	1"X2"				
	Inlet. Rating / Facing	12	ASME CL150 RF				
	Outlet. Rating / Facing	13	ASME CL150 RF				
MATERIALS	Body (Base)	14	SA351 CF8M	Calculation of Capacity			
	Bonnet	15	SA351 CF8M				
	Seat	16	316 SS-st.	$W = A * Kd * Kb * Kc * Kv / (11.78 * \sqrt{G / ((P * 1.1 - Pb))})$ $= 132.9 * 0.615 * 1 * 1 * 0.644 / (11.78 * \sqrt{(1.1 / (750 * 1.1 - 0))})$ $= 122.4 \text{ L/min}$ $= 7.3 \text{ m}^3/\text{h}$			
	Disc	17	316 SS-st.				
	Guide	18	316 SS				
	Gasket (Bonnet)	19	PTFE				
	Spring	20	Chrome Alloy(SWOSC-B) PK-ctd				
	Bellows	21	None				
BASIS	Approved by	22	UV STAMP	W	Valve Capacity	122.4 L/min	
	Comply with NACE	23	-	W1	Required Capacity	0.5 L/min	
	EN 10204	24	No	A1	Calculated Area	0.54303 mm ²	
	Code	25	API RP 520-Certification				
	Fire	26	No				
	Sizing Basis	27					
	Rupture Disk	28	No				
SERVICE CONDITION	Fluid / State	29	BIOCIDE(10%)Dosing Pumps (L) / LIQUID	A	Selected Area	132.9 mm ²	
	Mol. Weight / Specific Gravity	30	1.1	Kd	Coefficient of Discharge	0.615	
	Compressibility Factor	31	-	P	Set Pressure	750 KPag	
	Ratio of Specific Heat	32	-	Kb	Correction Factor Due to Back Pressure	1	
	Viscosity	33	8 cP	Kc	Correction Factor for a rupture disk	1	
	Operating / Relieving Temp.	34	40 / 40 °C	Kv	Correction Factor for Viscosity	0.644	
	Design Min. / Design Max. Temp.	35	- °C	G	Specific gravity	1.1	
	Operating / Set Pressure	36	/ 7.5 barg	Pb	Back Pressure	0 KPag	
	Design Pressure / C.D.T.P	37	- / 7.5 barg				
	Back Pressure	Superimposed - Constant	38	- barg			
		Superimposed - Variable	39	- barg			
		Built-up	40	- barg			
		Total	41	0 barg			
	Allowable Overpressure	42	10 %				
	Closing Pressure / Blowdown	43	Min. 5.625 barg / 25%				
SIZING & SELECTION	Required Capacity	44	0.03 m ³ /h	Remarks *Paint Color(*), *Painting system No.012 *Surface preparation : SSPC-SP1 - 1st. Epoxy primer (INTERGARD 251) 60 μm - 2nd. Epoxy undercoat (INTERGARD 475HS)GREY 150 μm - 3rd. Polyurethane topcoat (INTERTHANE 990) 70 μm Color : RAL 9006 Maker: International Paint			
	Valve Actual Capacity	45	7.3 m ³ /h				
	Calculated Orifice Area	46	0.54303 mm ²				
	Selected Orifice Area	47	132.9 mm ²				
	Orifice Dia.(mm)	48	D1(13)				
			-				
ETC	Paint System & Color	49	See Remark				
	Test Gag	50	No				
	Bug screen	51	No				

