**JOKWANG I.L.I**

## Pressure Safety & Relief Valve Specification and Calculation Sheet

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|---|---|---|---|
| Sheet No. | 5 of 11 | Rev . No | 1 |
| Project Name | Yeosu No.2 Complex Project(R2) 2nd PO | | |
| Project No. | | | |
| Date | 2021-01-22 | By | S.W.PARK |
| Checked | M.J.LEE | Approved | J.H.LEEM |

| | | | | |
|---|---|---|---|---|
| GENERAL | P&ID No. | 1 | H530-R2-PID-3037 | |
| | Tag No. | 2 | R2-PSV-3372 | |
| | Service Line | 3 | LP Cold drain to W-302-D6 (Cold Drains Vaporizer) | |
| | Model No. | 4 | JSV-FF100 | **Calculation** |
| | Quantity | 5 | 1 | |
| TYPE | Nozzle Type | 6 | Full Nozzle | Calculation of Area |
| | Design Type | 7 | Conventional | |
| | Bonnet Type | 8 | Close | |
| | Lever Type | 9 | None | A1 = 11.78*W1*(√G/(P1-Pb))/(Kd*Kb*Kc*Kv) |
| | Cap Type | 10 | Screwed | |
| CONN. | Size. Inlet / Outlet | 11 | 3/4"X1" | = 11.78*0.933333*√(0.449/(1617-9))/ |
| | Inlet. Rating / Facing | 12 | ASME CL.150 RF | (0.615*1*1*0.969) |
| | Outlet. Rating / Facing | 13 | ASME CL.150 RF | |
| MATERIALS | Body (Base) | 14 | SA351 CF8M | = **0.308293** ㎟ |
| | Bonnet | 15 | SA351 CF8M | |
| | Seat | 16 | 316 SS-st. | |
| | Disc | 17 | 316 SS-st. | Calculation of Capacity |
| | Guide | 18 | 316 SS | |
| | Gasket (Bonnet) | 19 | PTFE | |
| | Spring | 20 | 316 SS | W = A*Kd*Kb*Kc*Kv/(11.78*√(G/(P1-Pb))) |
| | Bellows | 21 | None | |
| BASIS | Approved by | 22 | KGS UV STAMP | = 132.9*0.615*1*1*0.969/(11.78*√(0.449/(1617-9))) |
| | Comply with NACE | 23 | No | |
| | EN 10204 | 24 | No | = 402.30 ℓ/min |
| | Code | 25 | API RP 520-Certification | = **24.1** m3/h |
| | Fire | 26 | No | |
| | Sizing Basis | 27 | Thermal Expansion | |
| | Rupture Disk | 28 | No | |

| | | | | |
|---|---|---|---|---|
| SERVICE CONDITION | Fluid / State | 29 | Hydrocarbon(HC) / LIQUID | |
| | Mol. Weight / Specific Gravity | 30 | 0.449 | |
| | Compressibility Factor | 31 | - | |
| | Ratio of Specific Heat | 32 | - | |
| | Viscosity | 33 | 0.12 cP | |
| | Operating / Relieving Temp. | 34 | -148 / 60 ℃ | |
| | Design Min. / Design Max. Temp. | 35 | -196/66 ℃ | |
| | Operating / Set Pressure | 36 | 0.588 / 1.47 MPag | |
| | Design Pressure / C.D.T.P | 37 | 1.47 / 1.47 MPag | |
| | Back Pressure: Superimposed - Constant | 38 | - MPag | |
| | Back Pressure: Superimposed - Variable | 39 | - MPag | |
| | Back Pressure: Built-up | 40 | 0.009 MPag | |
| | Back Pressure: Total | 41 | 0.009 MPag | |
| | Allowable Overpressure | 42 | 10 % | |
| | Closing Pressure / Blowdown(%) | 43 | Min. 1.2495 MPag / 15% | |
| SIZING & SELECTION | Required Capacity | 44 | 0.056 m3/h | |
| | Valve Actual Capacity | 45 | 24.1 m3/h | |
| | Calculated Orifice Area | 46 | 0.308293 ㎟ | |
| | Selected Orifice Area | 47 | 132.9 ㎟ | |
| | Orifice Dia.(mm) | 48 | D1(13) | |
| | | | - | |
| | | | - | |
| ETC | Paint System & Color | 49 | None | |
| | Test Gag | 50 | Yes | |
| | Bug screen | 51 | No | |

| | | |
|---|---|---|
| W | Valve Capacity | 402.30 ℓ/min |
| W1 | Required Capacity | 0.933333 ℓ/min |
| P | Set Pressure | 1470 KPag |
| A1 | Calculated Area | 0.308293 ㎟ |
| A | Selected Area | 132.9 ㎟ |
| Kd | Coefficient of Discharge | 0.615 |
| G | Specific Gravity | 0.449 |
| Pb | Back Pressure | 9 KPag |
| Kb | Correction Factor Due to Back Pressure | 1 |
| Kc | Correction Factor for a rupture disk | 1 |
| Kv | Correction Factor due to Viscosity | 0.969 |
| P1 | Set Pressure plus Overpressure | 1617 KPag |

## Remarks

*Remark
Service Requirement : Cryogenic Service

- Operating Pressure : 6 kg/㎠g
- Setting Pressure : 15 kg/㎠g
- Design Pressure : 15 kg/㎠g
- Constant Back Pressure : kg/㎠g
- Variable Back Pressure : kg/㎠g
- Built-up Back Pressure : 0.1 kg/㎠g
- Required Capacity : 24.695 kg/h
- Valve Capacity : 9833.1 kg/h