

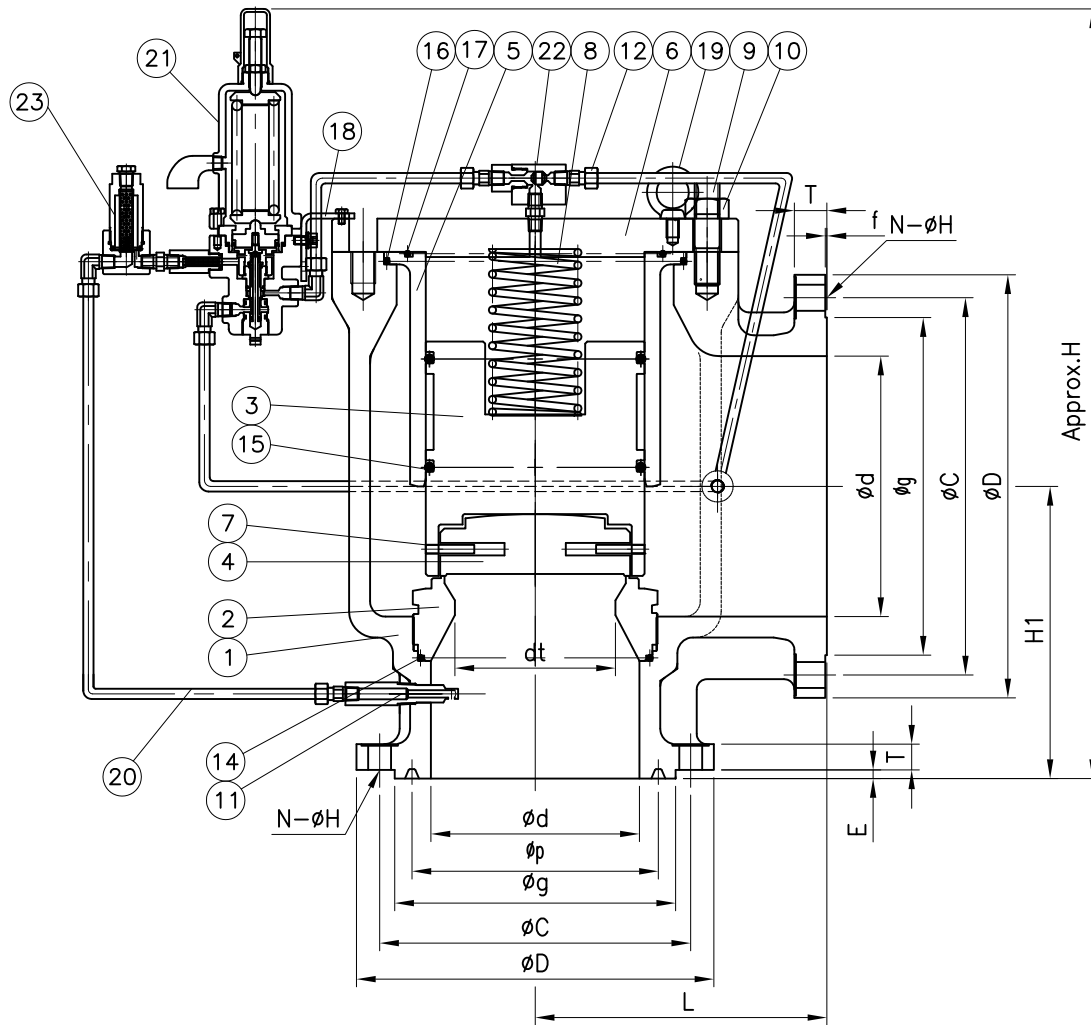


JOKWANG

Pressure Safety & Relief Valve Specification and Calculation Sheet

| | | | |
|--------------|------------|----------|------------|
| Sheet No. | 1 of 1 | Rev. No | 0 |
| Project Name | | | |
| Project No. | | | |
| Date | 2019-09-27 | By | JAEMOO.KIM |
| Checked | S.C.KIM | Approved | S.C.KIM |

| | | | | | | | | | | |
|--------------------------------|---------------------------------|-------------------------|--|--|-------------------------|----|-----------------------------|--|---------------------------------------|-----|
| GENERAL | P&ID No. | 1 | 00251213DPFMA180_01 | | | | | | | |
| | Tag No. | 2 | 002512135100PSV 106 | | | | | | | |
| | Service Line | 3 | WATER INJECTION MAIN PUMP DISCHARGE | | | | | | | |
| | Model No. | 4 | JSV-PF100 | SIZING & SELECTION | Required Capacity | 54 | 1175.46 m3/h | | | |
| | Quantity | 5 | 1 | | Valve Actual Capacity | 55 | 782.3 m3/h | | | |
| TYPE | Nozzle Type | 6 | Semi Nozzle | | Calculated Orifice Area | 56 | 3052.779756 mm ² | | | |
| | Design Type | 7 | Pilot | | Selected Orifice Area | 57 | 2045.16 mm ² | | | |
| | Valve Action Type | 8 | Modulating | | Orifice Dia.(mm) | 58 | L(51.03) | | | |
| | Bonnet Type | 9 | - | | | | | | | |
| | Lever Type | 10 | - | | | | | | | |
| Cap Type | 11 | - | | | | | | | | |
| CONN. | Size. Inlet / Outlet | 12 | 4"X6" | Calculation | | | | | | |
| | Inlet. Rating / Facing | 13 | ANSI CL.1500 RTJ | Calculation of Area | | | | | | |
| | Outlet. Rating / Facing | 14 | ANSI CL.150 RF | $A1 = 11.78 * W1 * \sqrt{(G / (1.25P - Pb)) / (Kd * Kb * Kc * Kv * Kp)}$ $= 11.78 * 19591 * (\sqrt{1.064 / (1.25 * 21380 - 0)}) / (0.795 * 1 * 1 * 1 * 0.6)$ $= \mathbf{3052.779756 \text{ mm}^2}$ | | | | | | |
| MATERIALS | Body | 15 | SA216 WCB | Calculation of Capacity | | | | | | |
| | Body Cover | 16 | SA276 316 | | | | | | | |
| | Piston | 17 | 316 SS | | | | | | | |
| | Seat | 18 | 316 SS | | | | | | | |
| | Seal (Main Seat) | 19 | FKM | | | | | | | |
| | Seal | 20 | FKM | | | | | | | |
| Spring | 21 | Chrome Alloy(SWOSC-B) | $W = A * Kd * Kb * Kc * Kv * Kp / (11.78 * \sqrt{(G / (1.25P - Pb))})$ $= 2045.16 * 0.795 * 1 * 1 * 1 * 0.6 / (11.78 * \sqrt{(1.064 / (1.25 * 21380 - 0))})$ $= 13,124.70 \text{ \textasciitilde/min}$ $= \mathbf{782.3 \text{ m3/h}}$ | | | | | | | |
| BASIS | Approved by | 22 | UV STAMP | Remarks | | | | | | |
| | Comply with NACE | 23 | No | | | | | | | |
| | EN 10204 | 24 | Type 3.1 | | | | | | | |
| | Code | 25 | API RP 520 | | | | | | | |
| | Fire | 26 | No | | | | | | | |
| | Sizing Basis | 27 | Blocked Outlet Value | | | | | | | |
| SERVICE CONDITION | Rupture Disk | 28 | No | <p>*Remark</p> <p>* Required Capacity : 1250700 kg/hr</p> <p>* Valve Capacity : 1300208 kg/hr</p> <p>* Inlet Bolt&Nut : A193 GR.B7M / A194 GR.2HM (HOT DIP GALV.)</p> | | | | | | |
| | Fluid / State | 29 | Sea Water / LIQUID | | | | W | Valve Capacity | 13,124.70 \textasciitilde/min | |
| | Mol. Weight / Specific Gravity | 30 | 1.064 | | | | W1 | Required Capacity | 19,591.00 \textasciitilde/min | |
| | Compressibility Factor | 31 | 1 | | | | P | Set Pressure | 21380 Kpag | |
| | Ratio of Specific Heat | 32 | - | | | | A1 | Calculated Area | 3052.779756 mm ² | |
| | Viscosity | 33 | 1.3 cP | | | | A | Selected Area | 2045.16 mm ² | |
| | Operating / Relieving Temp. | 34 | 77 / 77 °C | | | | Kd | Coefficient of Discharge | 0.795 | |
| | Design Min. / Design Max. Temp. | 35 | - °C | | | | G | Specific Gravity | 1.064 | |
| | Operating / Set Pressure | 36 | 190 / 213.8 barg | | | | Pb | Back Pressure | 0 Kpag | |
| | Design Pressure / C.D.T.P | 37 | - / 213.8 barg | | | | Kb | Correction Factor Due to Back Pressure | 1 | |
| | Back Pressure | Superimposed - Constant | 38 | | | | - barg | Kc | Correction Factor for a rupture disk | 1 |
| | | Superimposed - Variable | 39 | | | | 0.3 barg | Kv | Correction Factor due to Viscosity | 1 |
| | | Built-up | 40 | | | | 3.2 barg | Kp | Correction Factor due to Overpressure | 0.6 |
| | | Total | 41 | | | | 3.5 barg | | | |
| Allowable Overpressure | 42 | 10 % | | | | | | | | |
| Closing Pressure / Blowdown(%) | 43 | Min. 198.834 barg / 7% | | | | | | | | |
| PILOT ACCESSARY | Back Flow Peventer | 44 | Yes | | | | | | | |
| | Remote Sensing | 45 | None | | | | | | | |
| | Manual Blowdown Valve | 46 | None | | | | | | | |
| | Filed Test Connection | 47 | None | | | | | | | |
| | Auxiliary Filter | 48 | Yes | | | | | | | |
| | Heat Exchanger | 49 | None | | | | | | | |
| ETC | Paint System & Color | 50 | Silver | | | | | | | |
| | Test Gag | 51 | None | | | | | | | |
| | Bug screen | 52 | No | | | | | | | |



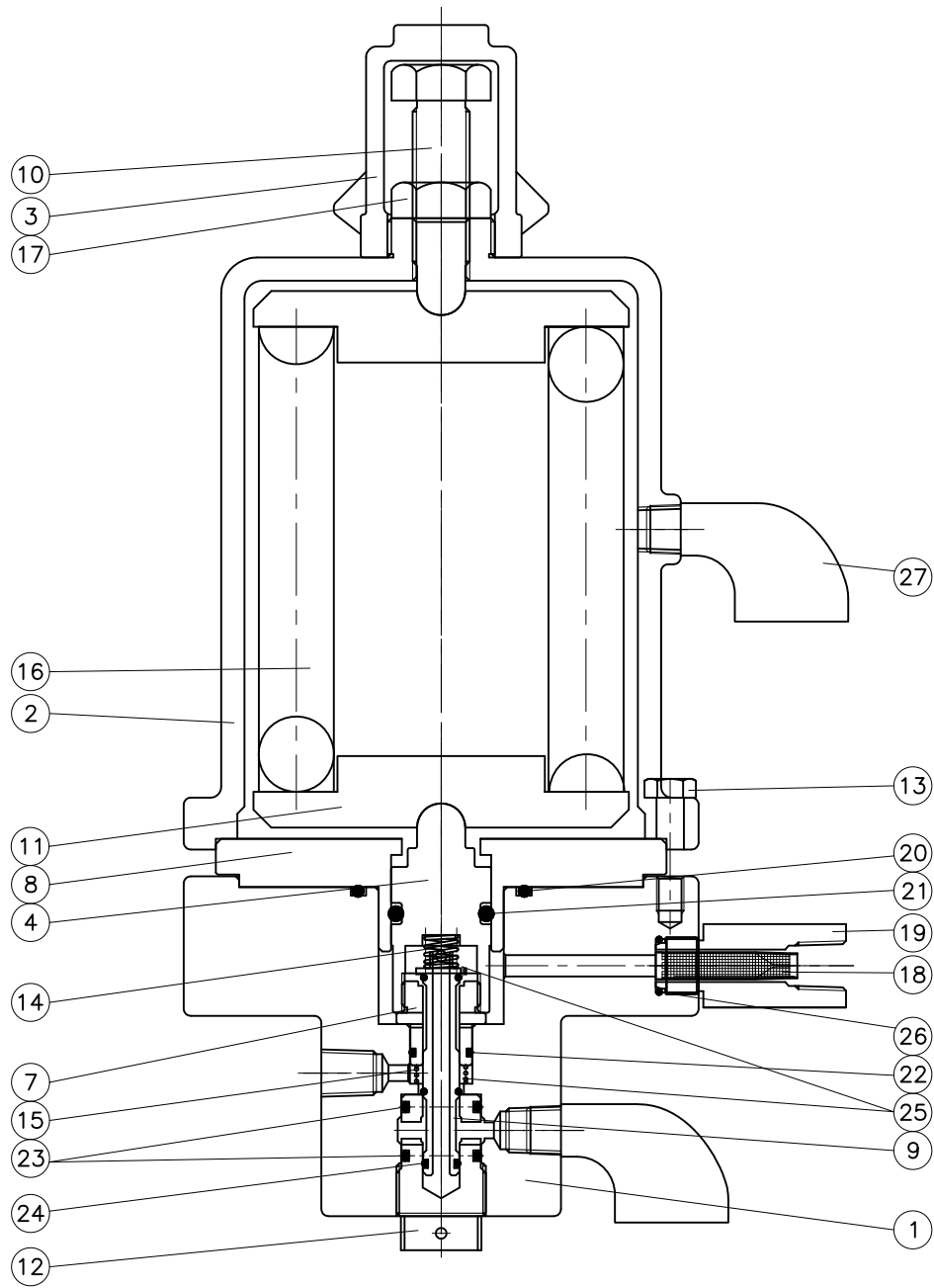
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|----|--------------------|--------------|----|----------|
| 23 | AUXILIARY FILTER | 316 SS | 1 | |
| 22 | BACKFLOW PREVENTOR | 316 SS | 1 | |
| 21 | PILOT CONTROL | MODULATING | 1 | |
| 20 | TUBE | TP316 SS | 4 | |
| 19 | I-BOLT | 304 SS | 2 | |
| 18 | BRACKET | 304 SS | 1 | |
| 17 | COVER SEAL | FKM | 1 | |
| 16 | GUIDE SEAL | FKM | 1 | |
| 15 | PISTON SEAL | FKM | 2 | |
| 14 | NOZZLE SEAL | FKM | 1 | |
| 13 | - | - | - | |
| 12 | NIPPLE | 316 SS | 10 | |
| 11 | PLUG | 316 SS | 1 | |
| 10 | HEX. NUT | A194 2H | 6 | |
| 9 | BODY STUD | A193 B7 | 6 | |
| 8 | RETURN SPRING | Chrome Alloy | 1 | |
| 7 | SPRING PIN | 316 SS | 2 | |
| 6 | COVER | SA276 316 | 1 | |
| 5 | GUIDE | 316 SS | 1 | |
| 4 | DISC | 316 SS | 1 | STELLITE |
| 3 | PISTON | 316 SS | 1 | |
| 2 | NOZZLE | 316 SS | 1 | STELLITE |
| 1 | BODY | SA216 WCB | 1 | |

| NO | PART NAME | MATERIAL | Q'TY | REMARK |
|---|-----------|-----------|------|------------|
| DES | | CHE | APP | DATE |
| CHE | | APP | DATE | 2019.10.01 |
| D.W.G NAME | | MODEL NO | | |
| PILOT OPERATED SAFETY RELIEF VALVE MODULATING TYPE CONTROL | | JSV-PF100 | | |
| D.W.G NO | | REV | | |
| JKS-191001A | | 0 | | |



DIMENSIONS

| SIZE | dt | L | H1 | H | INLET FLANGE ASME B 16.5 CL1500 RTJ | | | | | | | | OUTLET FLANGE ASME B 16.5 CL150 RF | | | | | | |
|--------|-------|-------|-------|-----|-------------------------------------|-----|--------|-----|-------|----|-----|------|------------------------------------|-----|-------|-------|------|---|------|
| | | | | | øD | ød | øp | øg | øC | T | E | N-øH | øD | ød | øg | øC | T | f | N-øH |
| 4X6"-L | 51.03 | 221.8 | 251.5 | 629 | 310 | 100 | 161.93 | 194 | 241.3 | 54 | 8.5 | 8-35 | 280 | 150 | 215.9 | 241.3 | 23.9 | 2 | 8-22 |

UNIT : mm



| | | | | |
|----|---------------------|---------------------|---|--|
| 27 | BUG VENT | COPPER ALLOY | 2 | |
| 26 | FILTER SEAL | FKM | 1 | |
| 25 | SEAT SEAL | FKM | 2 | |
| 24 | SPOOL SEAL | FKM | 1 | |
| 23 | SPOOL CAP SEAL | FKM | 2 | |
| 22 | BODY SEAL | FKM | 1 | |
| 21 | PISTON SEAL | FKM | 1 | |
| 20 | GUIDE SEAL | FKM | 1 | |
| 19 | FILTER HOUSING | 316 SS | 1 | |
| 18 | FILTER | 316 SS | 1 | |
| 17 | LOCK NUT | 304 SS | 1 | |
| 16 | SPRING | Chrome Alloy | 1 | |
| 15 | LOW RETURN SPRING | 316 SS | 1 | |
| 14 | SPOOL RETURN SPRING | 316 SS | 1 | |
| 13 | BONNET CAP SCREW | 316 SS | 4 | |
| 12 | SPOOL CAP | 316 SS | 1 | |
| 11 | SPRING BUTTONS | 316 SS | 2 | |
| 10 | SPRING ADJUST SCREW | 316 SS | 1 | |
| 9 | SPOOL | 316 SS | 1 | |
| 8 | GUIDE | 316 SS | 1 | |
| 7 | INLET SEAT | 316 SS | 1 | |
| 4 | PISTON | 316 SS | 1 | |
| 3 | CAP | 316 SS | 1 | |
| 2 | BONNET | SA351 CF8M/A276 316 | 1 | |
| 1 | BODY | SA351 CF8M/A276 316 | 1 | |

| NO | PART NAME | MATERIAL | Q'TY | REMARK |
|--|-----------|-------------|------|------------|
| DES | | CHE | APP | DATE |
|  안정민 | | 박종진 | 임채욱 | 2019.10.01 |
| D.W.G NAME | | MODEL NO | | |
| PILOT OPERATED SAFETY RELIEF VALVE MODULATING TYPE CONTROL | | JSV-PF100 | | |
|  | | D.W.G NO | REV | |
| | | JKS-1910011 | 0 | |