
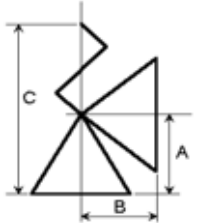


| | | | | | | | | | | |
|---|---|------------------------------------|-------------------|---|------------------|---------------------------------|-----------------------|----------------|---|---------|
|  <p>EMERSON edgardovicente.chiari@emerson.com</p> <p>Madrid, Spain +34 911 111 320 edgardovicente.chiari@emerson.com</p> | | | | Pressure Relief Valve Sizing & Selection Report | | | | | | |
| | | | | 0 | EVC | | | 27-jul.-2021 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Quote Number: 093-093 | | | | No | Prpd. | Chk. | Appr. | Date | Revision | |
| Client: TECHNIP ENERGIES | | | | End-User Ref. No.: 201754C001 | | | | | | |
| Location: CARTAGENA, SPAIN | | | | Project Ref. No.: U-608 Hydrogen Unit | | | | | | |
| Project: C43 "New Bios 2G Hydrotreatment Unit" | | | | | | | | | | |
| 1 | Valve ID | | | | 41 | SIZING DATA | | | | |
| 2 | Tag No. | 608-PSV-1073 | | | 42 | Design Code | ASME VIII/XIII - UV | | Sizing Std. | API 520 |
| 3 | Service | Hydrogen to battery limit | | | 43 | Sizing Basis | Blocked Outlet | | | |
| 4 | PID No. | P-C43-A-110990 H54 | | | 44 | Fluid State at Inlet | Gas / Vapor | | | |
| 5 | Line No. | 3"H-5402-C2 | Quantity | | 45 | Relieving Case | Pressure Relief | | | |
| 6 | | | 1 | | 46 | Fluid Properties | | | | |
| 7 | GENERAL | | | | 47 | Fluid Name | | Hydrogen | | |
| 8 | Valve Type | Balanced Bellows, Direct Spring-Op | | | 48 | Molecular Weight, M | | 2.020 | | |
| 9 | Safety / Relief | Safety | Balanced | Yes | 49 | Compressibility, Z | | 1.000 | | |
| 10 | Nozzle | Full | Bonnet | Vented | 50 | Ratio of Sp. Heats, k (Cp / Cv) | | 1.4 | | |
| 11 | CONNECTIONS | | | | 51 | Gas Constant, C | | 270.3 | | |
| 12 | Inlet | 1 1/2" | Flnkd. | 300# RF | 52 | | | | | |
| 13 | Outlet | 3" | Flnkd. | 150# RF | 53 | | | | | |
| 14 | MATERIALS OF CONSTRUCTION | | | | 54 | | | | | |
| 15 | Body / Base | CS SA216-WCB/WCC | | | 55 | | | | | |
| 16 | Bonnet / Cylinder | CS SA216-WCB/WCC | | | 56 | | | | | |
| 17 | Nozzle | 316 SST | | | 57 | | | | | |
| 18 | Disc | 316 SST | | | 58 | | | | | |
| 19 | Seat | Metal | | | 59 | Sizing Coefficients | | Unit | - | |
| 20 | Spindle | 416 SST | | | 60 | Effective K, Gas | | 0.975 | | |
| 21 | Guide | SS A297 Gr. HE | | | 61 | Kb | Kc | 1 | 1 | |
| 22 | Spring | Chrome Steel - Corr. Rest. | | | 62 | | | | | |
| 23 | Gaskets | 316 SST | | | 63 | | | | | |
| 24 | Bellows | Inconel® 625 | | | 64 | Required Capacity | | Unit | kg/hr | |
| 25 | Cap Type | Bolted w/ Test Rod | | | 65 | Total | | 1896 | | |
| 26 | NACE MR0175/ISO 15156:2015 | No | | | 66 | | | | | |
| 27 | Accessories | Bug Screen | | | 67 | Pressures | | Unit | kg/cm² g | |
| 28 | | | | | 68 | MAWP | Operating | 28 | 25 | |
| 29 | | | | | 69 | Set | CDTP | 28 | 28.00 | |
| 30 | | | | | 70 | Over Pressure | | 2.8 | 10% | |
| 31 | SIZING / SELECTION SUMMARY | | | | 71 | Built-Up | | 7 | | |
| 32 | Valve Model No. | 1.5G3JBS-E35M-P | | | 72 | Back Pressure | Constant Superimposed | 0 | | |
| 33 | Brand | Crosby® | | | 73 | | Variable Superimposed | 0 | | |
| 34 | Area | Calculated | Selected | 2.860 | 74 | | Total | 7 | | |
| 35 | (cm²) | Data Set | Orifice | API | 75 | Inlet Loss | | 0 | 0% | |
| 36 | | Unit | Required | kg/hr | 76 | Atmospheric (Barometric) | | 1.033 kg/cm² a | | |
| 37 | Flow | | Maximum | 2151.442 | 77 | Temperatures | | Unit | °C | |
| 38 | | | | | 78 | Normal System | | | | |
| 39 | Reaction Force, Open Discharge | | 819.1 N | | 79 | Operating | Relieving | 38 | 38 | |
| 40 | Noise Level (db), Open Discharge | | 142.0 at 1.0000-m | | 80 | Design Min | Design Max | | 80 | |
| Tag Notes | 1. Hydrogen Service. | | | | Valve Dimensions | mm | A | |  | |
| | 2. Maximum Carbon content % C Max 0.22 / %C Equivalent. Max. 0.43 (body and bonnet) | | | | | | 123.95 | | | |
| | 3. Maximum Content P(%) 0.020 - S(%) 0.015. (body and bonnet) | | | | | | B | | | |
| | 4. Standard C4M acc. IS O 12944 | | | | | | 152.40 | | | |
| | 5. Opening Adjustment 5% | | | | | | C | | | |
| | 6. NACE 0103 certificate required (disc & bellow). | | | | | | 603.25 | | | |
| | 7. Magnetic Particle (Body and Bonnet) | | | | | | Weight | | | |
| | 8. ASME "UV" Stamp required. | | | | | | 22.68 | | | |