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# Pressure Relief Valve Sizing & Selection Report

| No | Prpd. | Chk. | Appr. | Date | Revision |
|---|---|---|---|---|---|
| | | | | 27-jul.-2021 | |
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*Quote Number: 093-093*

| | | | |
|---|---|---|---|
| Client: | *TECHNIP ENERGIES* | | |
| Location: | *CARTAGENA, SPAIN* | End-User Ref. No.: | *201754C001* |
| Project: | *C43 "New Bios 2G Hydrotreatment Unit"* | Project Ref. No.: | *U-608 Hydrogen Unit* |

| | | | | | |
|---|---|---|---|---|---|
| 1 | **Valve ID** | | | | |
| 2 | Tag No. | *608-TSV-1050* | | | |
| 3 | Service | *E-741 CW side* | | | |
| 4 | PID No. | *P-C43-A-110990 H43* | | | |
| 5 | Line No. | *3/4"CWR-4312-B1* | | Quantity | |
| 6 | | | | 1 | |
| 7 | **GENERAL** | | | | |
| 8 | Valve Type | *Conventional, Direct Spring-Op* | | | |
| 9 | Safety / Relief | *Safety Relief* | Balanced | *No* | |
| 10 | Nozzle | *Full* | Bonnet | *Closed* | |
| 11 | **CONNECTIONS** | | | | |
| 12 | Inlet | *3/4"* | *Thrd.* | *MNPT* | Standard |
| 13 | Outlet | *1"* | *Thrd.* | *FNPT* | *ASME B1.20.1* |
| 14 | **MATERIALS OF CONSTRUCTION** | | | | |
| 15 | Body Cylinder | *CS SA216-WCB* | | | |
| 16 | Body Base | *316 SST* | | | |
| 17 | Connections | *N/A* | | | |
| 18 | Disc | *316 SST* | | | |
| 19 | Seat | *Metal* | | | |
| 20 | Seals | *N/A* | | | |
| 21 | Spindle | *416 SST* | | | |
| 22 | Guide | *316 SST* | | | |
| 23 | Spring | *17-7 PH SST* | | | |
| 24 | | | | | |
| 25 | Cap Type | *Screwed & Test Rod* | | | |
| 26 | NACE MR0175/ISO 15156:2015 | *No* | | | |
| 27 | Accessories | | | | |
| 28 | | | | | |
| 29 | | | | | |
| 30 | | | | | |
| 31 | **SIZING / SELECTION SUMMARY** | | | | |
| 32 | Valve Model No. | *961101MFB-P* | | | |
| 33 | Brand | *Crosby®* | | | |
| 34 | Area (cm²) | Calculated | Selected | | *0.710* |
| 35 | | Data Set | Orifice | *API* | *6* |
| 36 | Flow | Unit | Required | L/min | |
| 37 | | | Maximum | | 99.844 |
| 38 | | | | | |
| 39 | Reaction Force, Open Discharge | | *5.4 N* | | |
| 40 | Noise Level (db), Open Discharge | | *N/A* | | |

| | | | | |
|---|---|---|---|---|
| 41 | **SIZING DATA** | | | |
| 42 | Design Code | *ASME VIII/XIII - UV* | Sizing Std. | *API 520* |
| 43 | Sizing Basis | *Thermal Expansion* | | |
| 44 | Fluid State at Inlet | *Liquid* | | |
| 45 | Relieving Case | *Pressure Relief* | | |
| 46 | ***Fluid Properties*** | | | |
| 47 | Fluid Name | | *COOLING WATER* | |
| 48 | Sp. Gravity, G | | *0.980* | |
| 49 | Viscosity | | *0.43824 cSt* | |
| 50 | Reynolds No. | | | |
| 51 | Reynolds No. (max) | | *508437.17* | |
| 52 | | | | |
| 53 | | | | |
| 54 | | | | |
| 55 | | | | |
| 56 | | | | |
| 57 | | | | |
| 58 | | | | |
| 59 | ***Sizing Coefficients*** | | **Unit** | - |
| 60 | Effective K, Liquid | | *0.65* | |
| 61 | Kw | Kc | *1.0* | *1* |
| 62 | Kv | Kv (max) | | *1.0* |
| 63 | | | | |
| 64 | ***Required Capacity*** | | **Unit** | |
| 65 | Total | | | |
| 66 | | | | |
| 67 | ***Pressures*** | | **Unit** | kg/cm² g |
| 68 | MAWP | Operating | *6.5* | *4* |
| 69 | Set | CDTP | *6.5* | *6.500* |
| 70 | Over Pressure | | *0.65* | *10%* |
| 71 | Back Pressure | Built-Up | | *0.65* |
| 72 | | Constant Superimposed | | *0* |
| 73 | | Variable Superimposed | | *0* |
| 74 | | Total | | *0.65* |
| 75 | Inlet Loss | | *0* | *0%* |
| 76 | Atmospheric (Barometric) | | *1.033* | *kg/cm² a* |
| 77 | ***Temperatures*** | | **Unit** | °C |
| 78 | | Normal System | | |
| 79 | Operating | Relieving | *39* | *65.6* |
| 80 | Design Min | Design Max | | *100* |

**Tag Notes**

1. Standard C4M acc. ISO 12944
2. Opening Adjustment 5%
3. ASME "UV" Stamp required.

**Valve Dimensions**

| | | |
|---|---|---|
| mm | A | 79.38 |
| | B | 49.21 |
| | C | 307.98 |
| kg | Weight | 4.54 |