|  |  |  |
| --- | --- | --- |
|  | **Valve Sizing Calculation** |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Customer: | |  | | | | | |  | | | | | | |  |
| Fax: | |  | | | | | | Phone: | | |  | | | | |
| Contact: | |  | | | | | | Contact: | | |  | | | | |
| Item: | 1 | Qty: | | 1 | | | | PO Number: | | |  | | | | |
| Tags: | | FCV-2102 | | | | | | Project: | | | BINAK | | | | |
| Description: | |  | | | | | | P&ID Number: | | | BK-GCS-PEDCO-120-PR-PI-0003 | | | | |
| Service Description: TO | | SLUG CATCHER | | | | | | Line Number: | | | GAS-111-0001-FN07-8"-PT | | | | |
| Sizing Type: Ideal Gas | | | Flow is Turbulent | | | Solving for: Cv | | | Noise is IECAerodynamic | | | | Flow is Mass | | |
| Variable Name | | | | | Units | | Minimum- 0 | | | Normal- 1 | | Maximum- 2 | |  | |
| Gas | | | | |  | |  | | |  | |  | |  | |
| Temperature (T1) | | | | | deg C | | 32.0000 | | | 32.0000 | | 32.0000 | |  | |
| Inlet Pressure (P1) | | | | | bar(g) | | 6.500 | | | 6.500 | | 6.500 | |  | |
| Pressure Change (dP) | | | | | bar | | 1.00000 | | | 1.00000 | | 1.00000 | |  | |
| Mass flow rate (w) | | | | | kg/h | | 3944.160 | | | 11269.030 | | 13522.830 | |  | |
| Pressure Drop Ratio Factor (Xt) | | | | |  | | 0.654 | | | 0.611 | | 0.611 | |  | |
| Pressure Recovery Factor (Fl) | | | | |  | | 0.860 | | | 0.860 | | 0.860 | |  | |
| Valve Style Modifier (Fd) | | | | |  | | 0.260 | | | 0.200 | | 0.200 | |  | |
| Atmospheric Pressure | | | | | bar | | 1.0128 | | | 1.0128 | | 1.0128 | |  | |
| Kinematic Viscosity (Nu) | | | | | cSt | | 1.84000 | | | 1.84000 | | 1.84000 | |  | |
| Pipe Size Up | | | | | in | | 8 | | | 8 | | 8 | |  | |
| Pipe Schedule Up | | | | |  | | STD | | | STD | | STD | |  | |
| Pipe Size Down | | | | | in | | 8 | | | 8 | | 8 | |  | |
| Pipe Schedule Down | | | | |  | | STD | | | STD | | STD | |  | |
| Nominal Valve Diameter (dv) | | | | | in | | - | | | - | | - | |  | |
| Specific heats ratio (gamma) | | | | |  | | 1.260 | | | 1.260 | | 1.260 | |  | |
| Molecular weight /Specific gravity | | | | | M | | 23.570 | | | 23.57000 | | 23.570 | |  | |
| Critical Pressure (Pc) | | | | | bar(g) | | 102.100 | | | 102.100 | | 102.100 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Valve/Trim | | | | |  | | Globe/Angle | | | Globe/Angle | | Globe/Angle | |  | |
| Rn | | | | | m | | 1.10 | | | 1.10 | | 1.10 | |  | |
| Ao | | | | | in2 | | 49.000 | | | 49.000 | | 49.000 | |  | |
| T2 | | | | | deg C | | 31.0000 | | | 31.0000 | | 31.0000 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Sizing Coefficient (Cv) | | | | |  | | 58.390 | | | 168.347 | | 202.353 | |  | |
| Dynamic Viscosity (Mu) | | | | | cP | | 0.013 | | | 0.013 | | 0.013 | |  | |
| Pipe Outside Diam. Up | | | | | mm | | 219.07 | | | 219.07 | | 219.07 | |  | |
| Pipe Outside Diam. Down | | | | | mm | | 219.07 | | | 219.07 | | 219.07 | |  | |
| Gas Flow Rate (Qg) | | | | | Nm3/h | | 3747.81033 | | | 10708.03086 | | 12849.63133 | |  | |
| Inlet Compressibility Factor (Z1) | | | | |  | | 0.973 | | | 0.973 | | 0.973 | |  | |
| Whisper III Trim Level | | | | |  | |  | | |  | |  | |  | |
| LpAeTrim1m | | | | | dB(A) | | 77 | | | 82 | | 83 | |  | |
| LpAeOutlet1m | | | | | dB(A) | | < 50 | | | < 50 | | < 50 | |  | |
| LpAeValve1m | | | | | dB(A) | | 77 | | | 82 | | 83 | |  | |
| LpAeValveRn | | | | | dB(A) | | 76 | | | 82 | | 83 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Inlet fluid density (Rho1) | | | | | kg/m3 | | 7.17 | | | 7.17 | | 7.17 | |  | |
| M1 Pipe | | | | | Mach | | 0.013 | | | 0.037 | | 0.044 | |  | |
| Mo Valve | | | | | Mach | | 0.015 | | | 0.043 | | 0.052 | |  | |
| M2 Pipe | | | | | Mach | | 0.015 | | | 0.042 | | 0.051 | |  | |
| Outlet fluid density (Rho2) | | | | | kg/m3 | | 6.24 | | | 6.24 | | 6.24 | |  | |
| Upstream Fluid Velocity (V1) | | | | | m/s | | 4.7313 | | | 13.5180 | | 16.2215 | |  | |
| Downstream Fluid Velocity (V2) | | | | | m/s | | 5.4399 | | | 15.5424 | | 18.6509 | |  | |
| Z2 | | | | |  | | 0.973 | | | 0.973 | | 0.973 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Warnings | | | | |  | |  | | |  | |  | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
|  | | | | | | | | | | | | | | | |