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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Customer: | |  | | | | | |  | | | | | | |  |
| Fax: | |  | | | | | | Phone: | | |  | | | | |
| Contact: | |  | | | | | | Contact: | | |  | | | | |
| Item: | 1 | Qty: | | 1 | | | | PO Number: | | |  | | | | |
| Tags: | | FCV-2101 | | | | | | Project: | | | BINAK GCS | | | | |
| Description: | | - | | | | | | P&ID Number: | | | BK-GCS-120-PR-PI-0002 | | | | |
| Service Description: | | INLET K.O DRUM | | | | | | Line Number: | | | GAS-111-0001-AN07-6"-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 | | 46.1100 | | | 46.1100 | | 46.1100 | |  | |
| Inlet Pressure (P1) | | | | | bar(a) | | 6.500 | | | 6.500 | | 6.500 | |  | |
| Pressure Change (dP) | | | | | bar | | 1.000 | | | 1.000 | | 1.000 | |  | |
| Mass flow rate (w) | | | | | kg/h | | 2297.430 | | | 6564.084 | | 7876.901 | |  | |
| Pressure Drop Ratio Factor (Xt) | | | | |  | | 0.770 | | | 0.770 | | 0.770 | |  | |
| Pressure Recovery Factor (Fl) | | | | |  | | 0.900 | | | 0.900 | | 0.900 | |  | |
| Valve Style Modifier (Fd) | | | | |  | | 0.350 | | | 0.350 | | 0.350 | |  | |
| Atmospheric Pressure | | | | | psi | | 14.69 | | | 14.69 | | 14.69 | |  | |
| Kinematic Viscosity (Nu) | | | | | cSt | | 1.73400 | | | 1.73400 | | 1.73400 | |  | |
| Pipe Size Up | | | | | in | | 6 | | | 6 | | 6 | |  | |
| Pipe Schedule Up | | | | |  | | STD | | | STD | | STD | |  | |
| Pipe Size Down | | | | | in | | 6 | | | 6 | | 6 | |  | |
| Pipe Schedule Down | | | | |  | | STD | | | STD | | STD | |  | |
| Nominal Valve Diameter (dv) | | | | | in | | - | | | - | | - | |  | |
| Specific heats ratio (gamma) | | | | |  | | 1.220 | | | 1.220 | | 1.220 | |  | |
| Molecular weight /Specific gravity | | | | | M | | 26.360 | | | 26.360 | | 26.360 | |  | |
| Critical Pressure (Pc) | | | | | bar(g) | | 106.096 | | | 106.096 | | 106.096 | |  | |
| Critical Temperature (Tc) | | | | | deg C | | 49.586 | | | 49.586 | | 49.586 | |  | |
| Valve/Trim | | | | |  | | Globe/Angle | | | Globe/Angle | | Globe/Angle | |  | |
| Rn | | | | | m | | 1.10 | | | 1.10 | | 1.10 | |  | |
| Ao | | | | | in2 | | 4.000 | | | 4.000 | | 4.000 | |  | |
| T2 | | | | | deg C | | 45.000 | | | 45.000 | | 45.000 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Sizing Coefficient (Cv) | | | | |  | | 35.538 | | | 102.580 | | 123.739 | |  | |
| Dynamic Viscosity (Mu) | | | | | cP | | 0.011 | | | 0.011 | | 0.011 | |  | |
| Pipe Outside Diam. Up | | | | | in | | 6.625 | | | 6.625 | | 6.625 | |  | |
| Pipe Outside Diam. Down | | | | | in | | 6.625 | | | 6.625 | | 6.625 | |  | |
| Gas Flow Rate (Qg) | | | | | Nm3/h | | 1951.99879 | | | 5577.13794 | | 6692.56569 | |  | |
| Inlet Compressibility Factor (Z1) | | | | |  | | 0.978 | | | 0.978 | | 0.978 | |  | |
| Whisper III Trim Level | | | | |  | |  | | |  | |  | |  | |
| LpAeTrim1m | | | | | dB(A) | | 76 | | | 81 | | 82 | |  | |
| LpAeOutlet1m | | | | | dB(A) | | < 50 | | | 71 | | 78 | |  | |
| LpAeValve1m | | | | | dB(A) | | 76 | | | 81 | | 83 | |  | |
| LpAeValveRn | | | | | dB(A) | | 75 | | | 81 | | 83 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Inlet fluid density (Rho1) | | | | | kg/m3 | | 6.60 | | | 6.60 | | 6.60 | |  | |
| M1 Pipe | | | | | Mach | | 0.015 | | | 0.042 | | 0.051 | |  | |
| Mo Valve | | | | | Mach | | 0.127 | | | 0.361 | | 0.434 | |  | |
| M2 Pipe | | | | | Mach | | 0.018 | | | 0.050 | | 0.060 | |  | |
| Outlet fluid density (Rho2) | | | | | kg/m3 | | 5.59 | | | 5.59 | | 5.59 | |  | |
| Upstream Fluid Velocity (V1) | | | | | m/s | | 5.1885 | | | 14.8244 | | 17.7893 | |  | |
| Downstream Fluid Velocity (V2) | | | | | m/s | | 6.1305 | | | 17.5156 | | 21.0187 | |  | |
| Z2 | | | | |  | | 0.982 | | | 0.982 | | 0.982 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Warnings | | | | |  | |  | | |  | |  | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
|  | | | | | | | | | | | | | | | |