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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Customer: | |  | | | | | |  | | | | | | |  |
| Fax: | |  | | | | | | Phone: | | |  | | | | |
| Contact: | |  | | | | | | Contact: | | |  | | | | |
| Item: | 1 | Qty: | | 1 | | | | PO Number: | | |  | | | | |
| Tags: | | PVC-2201 | | | | | | Project: | | | PCV-2201 | | | | |
| Description: | |  | | | | | | P&ID Number: | | | BK-GCS-PEDCO-120-PR-PI-0015(1/2) | | | | |
| Service Description: | | AIR COMPRESSORE PACKAGE | | | | | | Line Number: | | | PLA-112-0010-AN04-1 1/2"-PT | | | | |
| Sizing Type: Ideal Gas | | | Flow is Turbulent | | | Solving for: Cv | | | Noise is IECAerodynamic | | | | Flow is Volumetric | | |
| Variable Name | | | | | Units | | Minimum- 0 | | | Normal- 1 | | Maximum- 2 | |  | |
| Gas | | | | |  | |  | | |  | |  | |  | |
| Temperature (T1) | | | | | deg C | | 65.0000 | | | 65.0000 | | 65.0000 | |  | |
| Inlet Pressure (P1) | | | | | bar(g) | | 9.000 | | | 9.000 | | 9.000 | |  | |
| Pressure Change (dP) | | | | | bar | | 4.500 | | | 4.500 | | 4.500 | |  | |
| Gas Flow Rate (Qg) | | | | | Nm3/h | | 24.00000 | | | 30.00000 | | 36.00000 | |  | |
| Pressure Drop Ratio Factor (Xt) | | | | |  | | 0.650 | | | 0.650 | | 0.650 | |  | |
| Pressure Recovery Factor (Fl) | | | | |  | | 0.900 | | | 0.900 | | 0.900 | |  | |
| Valve Style Modifier (Fd) | | | | |  | | 0.350 | | | 0.350 | | 0.350 | |  | |
| Atmospheric Pressure | | | | | bar | | 1.0128 | | | 1.0128 | | 1.0128 | |  | |
| Kinematic Viscosity (Nu) | | | | | cSt | | 2.00194 | | | 2.00194 | | 2.00194 | |  | |
| Pipe Size Up | | | | | in | | 1.5 | | | 1.5 | | 1.5 | |  | |
| Pipe Schedule Up | | | | |  | | STD | | | STD | | STD | |  | |
| Pipe Size Down | | | | | in | | 1.5 | | | 1.5 | | 1.5 | |  | |
| Pipe Schedule Down | | | | |  | | STD | | | STD | | STD | |  | |
| Nominal Valve Diameter (dv) | | | | | in | | - | | | - | | - | |  | |
| Specific heats ratio (gamma) | | | | |  | | 1.410 | | | 1.410 | | 1.410 | |  | |
| Molecular weight /Specific gravity | | | | | SG | | 0.990 | | | 0.990 | | 0.990 | |  | |
| Critical Pressure (Pc) | | | | | psia | | 2770.407 | | | 2770.407 | | 2770.407 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Valve/Trim | | | | |  | | Globe/Angle | | | Globe/Angle | | Globe/Angle | |  | |
| Rn | | | | | in | |  | | |  | |  | |  | |
| Ao | | | | | in2 | |  | | |  | |  | |  | |
| T2 | | | | | deg C | | 60.0000 | | | 60.0000 | | 60.0000 | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Sizing Coefficient (Cv) | | | | |  | | 0.214 | | | 0.268 | | 0.322 | |  | |
| Dynamic Viscosity (Mu) | | | | | cP | | 0.021 | | | 0.021 | | 0.021 | |  | |
| Pipe Outside Diam. Up | | | | | in | | 1.900 | | | 1.900 | | 1.900 | |  | |
| Pipe Outside Diam. Down | | | | | in | | 1.900 | | | 1.900 | | 1.900 | |  | |
| Mass flow rate (w) | | | | | kg/h | | 30.7335 | | | 38.4169 | | 46.1003 | |  | |
| Inlet Compressibility Factor (Z1) | | | | |  | | 0.990 | | | 0.990 | | 0.990 | |  | |
| Whisper III Trim Level | | | | |  | |  | | |  | |  | |  | |
| LpAeTrim1m | | | | | dB(A) | |  | | |  | |  | |  | |
| LpAeOutlet1m | | | | | dB(A) | | - - | | | - - | | - - | |  | |
| LpAeValve1m | | | | | dB(A) | |  | | |  | |  | |  | |
| LpAeValveRn | | | | | dB(A) | |  | | |  | |  | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Inlet fluid density (Rho1) | | | | | kg/m3 | | 10.32 | | | 10.32 | | 10.32 | |  | |
| M1 Pipe | | | | | Mach | |  | | |  | |  | |  | |
| Mo Valve | | | | | Mach | |  | | |  | |  | |  | |
| M2 Pipe | | | | | Mach | |  | | |  | |  | |  | |
| Outlet fluid density (Rho2) | | | | | kg/m3 | |  | | |  | |  | |  | |
| Upstream Fluid Velocity (V1) | | | | | m/s | |  | | |  | |  | |  | |
| Downstream Fluid Velocity (V2) | | | | | m/s | |  | | |  | |  | |  | |
| Z2 | | | | |  | |  | | |  | |  | |  | |
|  | | | | |  | |  | | |  | |  | |  | |
| Warnings | | | | |  | |  | | |  | |  | |  | |
|  | | | | |  | | A value for variable 'Valve Outlet Area' must be provided. | | | A value for variable 'Valve Outlet Area' must be provided. | | A value for variable 'Valve Outlet Area' must be provided. | |  | |
|  | | | | | | | | | | | | | | | |