

Howden Select Diaphragm Compressor

Project no. : Client : Element 2
Quotation no. : Item no(s) :
Sales no.



Performance Design

Design : Yes
Compressor : Compressor 1
Frame type : PD 166 L
Process : Process 1
Duty : Duty 1
Speed : 415 rpm

Stage data

	Stage 1	
Suction line temperature (T1)	40	°C
Suction line pressure (P1)	74.625	bar(a)
Discharge line pressure (P2)	350.000	bar(a)
PSV set pressure	370.9533	bar(a)
Flow input	Mass	
Mass flow	50.0	kg/h

Gas composition

	(Mol%)	Stage 1
Hydrogen	H2	100
Molweight (kg/kmol)		2.016

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Output stage(s)

	Stage 1	
	Normal	
Suction		
Pressure (P1)	74.63	bar(a)
Temperature (T1)	40.0	°C
Density (Rho1)	5.569	kg/m ³
Heat capacity ratio (Cp/Cv1)	1.4259	
Compressibility (Z1)	1.0376	
Discharge		
Pressure (P2)	350.00	bar(a)
Temperature, adiabatic (T2ad)	217.7	°C
Temperature, polytr. (T2poly)	206.6	°C
Density (Rho2)	15.576	kg/m ³
Heat capacity ratio (Cp/Cv2)	1.4169	
Compressibility adiabatic (Z2ad)	1.1357	
Compressor		
Massflow Dry (G)	38.3	kg/h
Liquid dropout (G)	0.0	kg/h
Volume flow (Q0)	426	Nm ³ /h
Suction flow (Qs)	1.91	dm ³ /s
Required mass flow dry	50.0	kg/h
Required volume flow dry	556	Nm ³ /h
Adiabatic power, excl. margins (Nad)	29.6	kW
Cylinder power (Ni)	33.3	kW
Effective power	34.1	kW
Volume ratio (Ecy1)	2.851	
Isentropic temp.exp. (Xt_compr)	1.4013	
Isentropic vol.exp. (Xv_compr)	1.5274	
Qfactor (flow in % req. flow)	76.60	%
Mass force (comp./tens.)	-3.96 / 5.95	kN
Gas force (comp./tens.)	-88.4 / -17.3	kN
Rodload (comp./tens.)	-98.5 / -16.7	kN
Pinload (comp./tens.)	-93.6 / -13.8	kN
Crankdegrees pinload rev.	0	°
Total effective power total	34	kW
Motor rated power	45	kW
<i>Note: compressibility, density, exponents are based on cylinder flange pressures and temperatures.</i>		