

Program Version	Creation Date	Country	State/City	Calculator	ROM Version
1.00	11/13/2001	 ARGENTINA	NEUQUEN		HPHP48-R (HP48G+)
Program Author : Miguel Angel CAPORALINI HERK					
Program Title					
Centrifugal and Reciprocating Gas Compressors (Calculus)					
Library Number		Checksum (CRC)		Bytes	
L912 – GasCompress		# 2120h		20,697.0	

I'm writing this program in UsrRPL Language and create a Library with name ... L912 - GasCompress, wich allow calculate as follow :

0.Centrifugal	
0.Performance	0.Inlet Volume (ICFM) : WF - Weight Flow (lb/min) AT - Absolute Inlet Temperature (°F) CF - Inlet Compressibility Factor MW - Molecular Weight PR - Inlet Pressure (psia) 1.Head Isentropic Process (ft.lb/lb) : CF - Compressibility Factor UG - Universal Gas Constant (1.986 BTU/lb mole x °R) AT - Absolute Temperature (°R) MW - Molecular Weight IE - Isentropic Exponent IP - Inlet Pressure (psia) OP - Outlet Pressure (psia) 2.Average Compressibility Factor : CF1 - Inlet Compressibility Factor CF2 - Outlet Compressibility Factor
1.Isentropic	0.Head (ft.lb/lb) : ACF - Average Compressibility Factor UGC - Universal Gas Constant (1.986 BTU/lb mole x °R) AIT - Absolute Inlet Temperature (°R) MOW - Molecular Weight ISE - Isentropic Exponent OPR - Outlet Pressure (psia) IPR - Inlet Pressure (psia) 1.Gas Horsepower (Ghp) : WFL - Weight Flow (lb/min) HIP - Head Isentropic Process (ft.lb/lb) EIP - Efficiency Isentropic Process (decimal) Continuance in page # 2

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	<p><u>2.Ideal Discharge Temperature :</u> <u>0.DTemperature Ideal (°R)</u> AIT - Absolute Inlet Temperature (°R) OUP - Outlet Pressure (psia) INP - Inlet Pressure (psia) ISE - Isentropic Exponent <u>1.Absolute Temperature Outlet Condition (°R)</u> AIT - Absolute Inlet Temperature (°R) DTI - D Ideal Discharge Temperature (°R) <u>3.Actual Discharge Temperature :</u> <u>0.DTemperature Actual (°R)</u> AIT - Absolute Inlet Temperature (°R) OUP - Outlet Pressure (psia) INP - Inlet Pressure (psia) ISE - Isentropic Exponent EFF - Efficiency (decimal) <u>1.Absolute Temperature Outlet Condition (°R)</u> AIT - Absolute Inlet Temperature (°R) DTA - D Actual Discharge Temperature (°R)</p>
2.Polytropic	<p><u>0.Head Polytropic Process (Ft.Lb/Lb) :</u> SCF - Suction Compressibility Factor DCF - Discharge Compressibility Factor UGC - Universal Gas Constant (1.986 BTU/lb mole x °R) ATP - Absolute Temperature (°R) MWE - Molecular Weight POE - Polytropic Exponent (# moles) IPR - Inlet Pressure (psia) OPR - Outlet Pressure (psia) <u>1.Gas Horsepower (Ghp) :</u> WFL - Weight Flow (lb/min) HPP - Head Polytropic Process (ft.lb/lb) EPP - Efficiency Polytropic Process (decimal)</p>
3.Polytropic & Isentropic Head	<p>(ft.lb/lib) HIS - Head Isentropic Process (ft.lb/lb) EFP - Efficiency Polytropic Process (decimal) EIP - Efficiency Isentropic Process (decimal)</p>
4.Mechanical Losses	<p><u>0.Bearings & Seals Losses :</u> WFL - Weight Flow (lb/min) HPP - Head Polytropic Process (ft.lb/lb) EPP - Efficiency Polytropic Process (decimal) <u>1.Brake Horsepower with Mech.Losses (Bhp) :</u> WFL - Weight Flow (lb/min) HPP - Head Polytropic Process (ft.lb/lb) EPP - Efficiency Polytropic Process (decimal)</p>

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5.Compressor Speed	(rpm) NSP - Nominal Speed at 10000 ft. of Head/Stage THD - Total Head (ft.lb/lb) NOW - Number of Wheels HMS - Head Maximum Stage (ft.lb/lb)
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1.Reciprocating	
0.Preliminary Bhp	(bhp) RS - Ratio per Stage N° - Number of Stages CC - Capacity (MMcfd at 14,4 psia) AL - Allowance for Interstage Pressure Drop (*)
1.Molar Heat (Cv)	(BTU/lb mol x °F @ 150 °F) MCP - Molar Specific Heat at Cp (constant pressure) UGC - Universal Gas Constant (1.986 BTU/lb mole x °R)
2.Molar Heat (Cp)	(BTU/lb mol x °F @ 150 °F) MVC - Molar Specific Heat at Cv (constant volume) UGC - Universal Gas Constant (1.986 BTU/lb mole x °R)
3.Isentropic Exponent	MCP - Molar Specific Heat at Cp (constant pressure) MCV - Molar Specific Heat at Cv (constant volume)
4.Inlet Capacity	<u>0.ICFM (inlet cu.ft. per minute at 14.7 psia and 60 °F):</u> TI - Absolute Inlet Temperature (°R) PI - Inlet Pressure (psia) CF - Inlet Compressibility Factor SC - Standard Compressibility Factor <u>1.Weight Flow (lb/min):</u> MW - Molecular Weight WF - Weight Flow (lb/min) TI - Absolute Inlet Temperature (°R) PI - Inlet Pressure (psia) CF - Inlet Compressibility Factor SC - Standard Compressibility Factor <u>2.Molar Flow (moles/min):</u> MF - Molecular Flow (moles/min) TI - Absolute Inlet Temperature (°R) PI - Inlet Pressure (psia) CF - Inlet Compressibility Factor SC - Standard Compressibility Factor

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5. Piston Displacement	<u>0. Single Action Piston (ft³/min):</u> <u>0. Outer End:</u> ST - Length (stroke) of Piston Movement (inches) SP - Speed (rpm) CD - Cylinder Diameter (inches) <u>1. Crank End:</u> ST - Length (stroke) of Piston Movement (inches) SP - Speed (rpm) CD - Cylinder Diameter (inches) RD - Piston Rod Diameter (inches) <u>1. Double Action Piston (ft³/min):</u> ST - Length (stroke) of Piston Movement (inches) SP - Speed (rpm) CD - Cylinder Diameter (inches) RD - Piston Rod Diameter (inches)
	(%) CR - Compression Ratio (Pressure Outlet / Pressure Inlet) CC - Cylinder Clearance (%) CS - Compressibility Factor (Suction) CD - Compressibility Factor (Discharge) IE - Isentropic Exponent (Pressure / Volume)
	(MMcfd @ 14.4 psia & suction temperature) PD - Piston Displacement (ft ³ /min) VE - Volumetric Efficiency (%) SP - Suction Pressure (psia) CD - Compressibility Factor (suction)
	(°F) ST - Absolute Suction Temperature (°F) CR - Compression Ratio (Outlet Pressure / Inlet Pressure) IE - Isentropic Exponent
	<u>0. Compression (pounds):</u> DPR - Discharge Pressure (psia) CSP - Cross Sectional Piston Area (inches ²) SPR - Suction Pressure (psia) CRP - Cross Sectional Piston Rod Area (inches ²) <u>1. Tension (pounds):</u> DPR - Discharge Pressure (psia) CSP - Cross Sectional Piston Area (inches ²)

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	SPR - Suction Pressure (psia) CRP - Cross Sectional Piston Rod Area (inches ²)
10.Effective Brake Horsepower	(bhp) PBA - Pressure Base (psia) AST - Absolute Suction Temperature (°R) ATS - Absolute Temperature for Standard Condition (°R) CFS - Compressibility Suction Factor CFD - Compressibility Discharge Factor

References :

ICFM	Inlet Cubic Feet per Minute
SCFM	Standard Cubic Feet per Minute (measured at 14.7 psia and 60 °F)
°R	°F + 460
Universal Gas Constant	1.986 BTU / lb mole x °R
Allowance for Interstage Pressure Drop (*)	1.00 for single stage compression 1.08 for two stage compression 1.10 for three stage compression

For any questions, please contact me : [:-)]

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