

CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008
Lead User Name	Item	Atmospheric Pressure 13.42 psi
Project	Screw Open	Elevation 2500 ft

CONDITION #1

Upstream Pressure	65.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.291
Upstream Temperature	60.0 °F	Compressor Power	686.2 hp	Ethane	8.292
Discharge Temp	190.5 °F	Suction Flow Std	6192.8 scfm	Propane	3.663
Discharge Dew Point	89.7 °F	Suction Flow Std	8.918 MMSCFD	n-Butane	0.378
Oil Flow	70.7 gpm	Suction Flow Actual	1160.6 cfm	Isobutane	0.478
Volumetric Eff	86.2%	Suction Mass Flow	321.4 lbm/min	n-Pentane	0.975
Adiabatic Eff	76.1%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.826
				Nitrogen	0.378
				Water	0.291

CONDITION #2

Upstream Pressure	75.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.316
Upstream Temperature	60.0 °F	Compressor Power	706.5 hp	Ethane	8.294
Discharge Temp	187.3 °F	Suction Flow Std	7066.2 scfm	Propane	3.664
Discharge Dew Point	86.2 °F	Suction Flow Std	10.175 MMSCFD	n-Butane	0.378
Oil Flow	66.0 gpm	Suction Flow Actual	1169.0 cfm	Isobutane	0.478
Volumetric Eff	86.9%	Suction Mass Flow	366.7 lbm/min	n-Pentane	0.976
Adiabatic Eff	74.6%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.826
				Nitrogen	0.378
				Water	0.260

CONDITION #3

Upstream Pressure	85.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.337
Upstream Temperature	60.0 °F	Compressor Power	721.3 hp	Ethane	8.296
Discharge Temp	183.8 °F	Suction Flow Std	7928.5 scfm	Propane	3.665
Discharge Dew Point	83.2 °F	Suction Flow Std	11.417 MMSCFD	n-Butane	0.378
Oil Flow	61.0 gpm	Suction Flow Actual	1173.4 cfm	Isobutane	0.478
Volumetric Eff	87.2%	Suction Mass Flow	411.4 lbm/min	n-Pentane	0.976
Adiabatic Eff	72.6%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.378
				Water	0.236

CONDITION #4

Upstream Pressure	95.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.353
Upstream Temperature	60.0 °F	Compressor Power	726.9 hp	Ethane	8.298
Discharge Temp	180.0 °F	Suction Flow Std	8802.1 scfm	Propane	3.666
Discharge Dew Point	80.5 °F	Suction Flow Std	12.675 MMSCFD	n-Butane	0.379
Oil Flow	52.2 gpm	Suction Flow Actual	1177.8 cfm	Isobutane	0.478
Volumetric Eff	87.5%	Suction Mass Flow	456.8 lbm/min	n-Pentane	0.976
Adiabatic Eff	70.9%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.379
				Water	0.216

CONDITION #5					
Upstream Pressure	105.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.367
Upstream Temperature	60.0 °F	Compressor Power	723.3 hp	Ethane	8.299
Discharge Temp	179.5 °F	Suction Flow Std	9685.2 scfm	Propane	3.666
Discharge Dew Point	78.2 °F	Suction Flow Std	13.947 MMSCFD	n-Butane	0.379
Oil Flow	17.7 gpm	Suction Flow Actual	1182.2 cfm	Isobutane	0.478
Volumetric Eff	87.8%	Suction Mass Flow	502.6 lbm/min	n-Pentane	0.976
Adiabatic Eff	69.4%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.379
				Water	0.200

CONDITION #6					
Upstream Pressure	115.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.379
Upstream Temperature	60.0 °F	Compressor Power	710.9 hp	Ethane	8.300
Discharge Temp	170.6 °F	Suction Flow Std	10572.5 scfm	Propane	3.667
Discharge Dew Point	76.0 °F	Suction Flow Std	15.224 MMSCFD	n-Butane	0.379
Oil Flow	16.1 gpm	Suction Flow Actual	1185.8 cfm	Isobutane	0.478
Volumetric Eff	88.1%	Suction Mass Flow	548.7 lbm/min	n-Pentane	0.977
Adiabatic Eff	68.2%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.379
				Water	0.186

CONDITION #7					
Upstream Pressure	125.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.389
Upstream Temperature	60.0 °F	Compressor Power	690.0 hp	Ethane	8.301
Discharge Temp	161.5 °F	Suction Flow Std	11465.3 scfm	Propane	3.667
Discharge Dew Point	74.1 °F	Suction Flow Std	16.510 MMSCFD	n-Butane	0.379
Oil Flow	14.5 gpm	Suction Flow Actual	1188.9 cfm	Isobutane	0.478
Volumetric Eff	88.3%	Suction Mass Flow	595.0 lbm/min	n-Pentane	0.977
Adiabatic Eff	67.1%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.379
				Water	0.174

CONDITION #8					
Upstream Pressure	135.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.397
Upstream Temperature	60.0 °F	Compressor Power	661.6 hp	Ethane	8.302
Discharge Temp	151.1 °F	Suction Flow Std	12362.0 scfm	Propane	3.668
Discharge Dew Point	72.3 °F	Suction Flow Std	17.801 MMSCFD	n-Butane	0.379
Oil Flow	11.4 gpm	Suction Flow Actual	1191.6 cfm	Isobutane	0.478
Volumetric Eff	88.5%	Suction Mass Flow	641.6 lbm/min	n-Pentane	0.977
Adiabatic Eff	66.1%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.379
				Water	0.164

CONDITION #9					
Upstream Pressure	145.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.405
Upstream Temperature	60.0 °F	Compressor Power	626.0 hp	Ethane	8.303
Discharge Temp	140.8 °F	Suction Flow Std	13263.1 scfm	Propane	3.668
Discharge Dew Point	70.7 °F	Suction Flow Std	19.099 MMSCFD	n-Butane	0.379
Oil Flow	8.5 gpm	Suction Flow Actual	1194.0 cfm		

Volumetric Eff	88.7%	Suction Mass Flow	688.3 lbm/min	Isobutane	0.478
Adiabatic Eff	65.2%			n-Pentane	0.977
				Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.379
				Water	0.155

Oil pressure differential is too low.

CONDITION #10

Upstream Pressure	155.0 psig	Speed	1200 rpm	<u>Gas</u>	<u>Mole %</u>
Downstream Pressure	232.0 psig	Percent Suct Vol Flow	100.0%	Methane	84.412
Upstream Temperature	60.0 °F	Compressor Power	583.6 hp	Ethane	8.304
Discharge Temp	131.0 °F	Suction Flow Std	14168.8 scfm	Propane	3.668
Discharge Dew Point	69.2 °F	Suction Flow Std	20.403 MMSCFD	n-Butane	0.379
Oil Flow	6.6 gpm	Suction Flow Actual	1196.0 cfm	Isobutane	0.478
Volumetric Eff	88.9%	Suction Mass Flow	735.3 lbm/min	n-Pentane	0.977
Adiabatic Eff	64.4%			Isopentane	0.239
				n-Hexane	0.189
				Carbon Dioxide	0.827
				Nitrogen	0.379
				Water	0.148

Oil pressure differential is too low.

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name

Reference

Date 4/30/2008

Run # 1

Lead User Name

Item

Screw Open

Atmospheric Pressure

13.42 psi

Project

Elevation

2500 ft

COMPRESSOR - SGC 3515

Compressor Power	686.2 hp	Compression Ratio	3.28	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.59	Volumetric Eff	86.2%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	2.59	Adiabatic Eff	76.1%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	63.5	321.4	1160.6	6192.8	8.918
Discharge	190.5	239.0	321.4	438.1	6192.8	8.918

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	536.4 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	70.7 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	49.9 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	20.9 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	100.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	190.5 °F
Upstream Pressure	65.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	89.7 °F

FLUID

Gas	Mole %
Methane	84.291
Ethane	8.292
Propane	3.663
n-Butane	0.378
Isobutane	0.478
n-Pentane	0.975
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.826
Nitrogen	0.378
Water	0.291
Molecular Weight	19.69

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name
Lead User Name
ProjectReference
Item Screw OpenDate 4/30/2008
Atmospheric Pressure 13.42 psi
Elevation 2500 ft

Run # 1

COMPRESSOR - SGC 3515

Compressor Power	686.2 hp	Compression Ratio	3.28	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.59	Volumetric Eff	86.2%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	2.59	Adiabatic Eff	76.1%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	63.5	321.4	1160.6	6192.8	8.918
Discharge	190.5	239.0	321.4	438.1	6192.8	8.918

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	536.4 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	70.7 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	49.9 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	20.9 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	100.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	190.5 °F
Upstream Pressure	65.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	89.7 °F

FLUID

Gas	Mole %
Methane	84.291
Ethane	8.292
Propane	3.663
n-Butane	0.378
Isobutane	0.478
n-Pentane	0.975
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.826
Nitrogen	0.378
Water	0.291
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5983	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	7581	489504	Balance Piston Force	9347.4 lbf	0.0 lbf
Female Inlet Radial	7534	749875	Inlet Blocking Dia	490 µin	704 µin
Female Outlet Radial	12558	379551	Outlet Blocking Dia	618 µin	960 µin
Male Axial	4432	111618	Max Rotor Body	955 µin	1427 µin
Female Axial	3017	530628	Max allowable deflection	2364 µin	
			Rotor Shaft Fatigue Safety Factor	3.01	2.65

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name
Lead User Name
ProjectReference
Item Screw OpenDate 4/30/2008
Atmospheric Pressure 13.42 psi
Elevation 2500 ft

Run # 2

COMPRESSOR - SGC 3515

Compressor Power	706.5 hp	Compression Ratio	2.90	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.31	Volumetric Eff	86.9%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	2.31	Adiabatic Eff	74.6%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	73.5	366.7	1169.0	7066.2	10.175
Discharge	187.3	239.0	366.7	497.2	7066.2	10.175

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	447.8 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	86.0 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	46.4 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	19.6 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	100.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	187.3 °F
Upstream Pressure	75.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	86.2 °F

FLUID

Gas	Mole %
Methane	84.316
Ethane	8.294
Propane	3.664
n-Butane	0.378
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.826
Nitrogen	0.378
Water	0.260
Molecular Weight	19.69

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name
Card User Name
ProjectReference
Item Screw OpenDate 4/30/2008
Atmospheric Pressure 13.42 psi
Elevation 2500 ft

COMPRESSOR - SGC 3515

Compressor Power	706.5 hp	Compression Ratio	2.90	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.31	Volumetric Eff	86.9%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	2.31	Adiabatic Eff	74.6%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	73.5	366.7	1169.0	7066.2	10.175
Discharge	187.3	239.0	366.7	497.2	7066.2	10.175

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	447.8 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	66.0 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	46.4 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	19.6 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	100.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	187.3 °F
Upstream Pressure	75.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	86.2 °F

FLUID

Gas	Mole %
Methane	84.316
Ethane	8.294
Propane	3.664
n-Butane	0.378
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.826
Nitrogen	0.378
Water	0.260
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5991	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	7549	496527	Balance Piston Force	8665.9 lbf	0.0 lbf
Female Inlet Radial	7745	683963	Inlet Blocking Dia	493 µin	719 µin
Female Outlet Radial	12578	377587	Outlet Blocking Dia	619 µin	971 µin
Male Axial	4640	97244	Max Rotor Body	960 µin	1452 µin
Female Axial	2978	551569	Max allowable deflection	2364 µin	
			Rotor Shaft Fatigue Safety Factor	2.97	2.64

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 3
Card User Name	Item	Atmospheric Pressure	13.42 psi
Project	Screw Open	Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	721.3 hp	Compression Ratio	2.60	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	87.2%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	2.09	Adiabatic Eff	72.6%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	83.5	411.4	1173.4	7928.5	11.417
Discharge	183.8	239.0	411.4	554.5	7928.5	11.417

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	359.7 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	61.0 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	42.6 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	18.4 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	100.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	183.8 °F
Upstream Pressure	85.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	83.2 °F

FLUID

Gas	Mole %
Methane	84.337
Ethane	8.296
Propane	3.665
n-Butane	0.378
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.378
Water	0.236
Molecular Weight	19.69

ERRORS AND WARNINGS

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SGC 3515 Open System

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Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 3
Lead User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	721.3 hp	Compression Ratio	2.60	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	87.2%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	2.09	Adiabatic Eff	72.6%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	Standard Volume Flow (MMSCFD)
Suction	60.0	83.5	411.4	1173.4	7928.5	11.417
Discharge	183.8	239.0	411.4	554.5	7928.5	11.417

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	359.7 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	61.0 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	42.6 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	18.4 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	100.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	183.8 °F
Upstream Pressure	85.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	83.2 °F

FLUID

Gas	Mole %
Methane	84.337
Ethane	8.296
Propane	3.665
n-Butane	0.378
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.378
Water	0.236
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors	
Position	Load lbf	L10 (hrs)	Male	Female
Male Inlet Radial	5928	1000000	Rotor Thrust Direction	Normal
Male Outlet Radial	7471	513930	Balance Piston Force	7984.0 lbf
Female Inlet Radial	7823	661343	Inlet Blocking Dia	490 µin
Female Outlet Radial	12465	389075	Outlet Blocking Dia	615 µin
Male Axial	4803	87694	Max Rotor Body	955 µin
Female Axial	2935	576330	Max allowable deflection	2364 µin
			Rotor Shaft Fatigue Safety Factor	2.96
				2.67

ERRORS AND WARNINGS

Disclaimer: the information contained in this program is subject to change without notice. Frick reserves the right to final verification of all rating results.



SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 4
End User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	726.9 hp	Compression Ratio	2.36	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	87.5%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.90	Adiabatic Eff	70.9%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	93.5	456.8	1177.8	8802.1	12.675
Discharge	180.0	239.0	456.8	611.5	8802.1	12.675

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	258.2 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	52.2 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	35.1 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	17.1 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	89.6%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	180.0 °F
Upstream Pressure	95.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	80.5 °F

FLUID

Gas	Mole %
Methane	84.353
Ethane	8.298
Propane	3.666
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.216
Molecular Weight	19.69

ERRORS AND WARNINGS

Disclaimer: the information contained in this program is subject to change without notice. Frick reserves the right to final verification of all rating results.



SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 4
End User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	726.9 hp	Compression Ratio	2.36	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	87.5%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.90	Adiabatic Eff	70.9%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	93.5	456.8	1177.8	8802.1	12.675
Discharge	180.0	239.0	456.8	611.5	8802.1	12.675

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	258.2 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	52.2 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	35.1 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	17.1 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	89.6%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	180.0 °F
Upstream Pressure	95.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	80.5 °F

FLUID

Gas	Mole %
Methane	84.353
Ethane	8.298
Propane	3.666
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.216
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5909	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	7496	508388	Balance Piston Force	7301.7 lbf	0.0 lbf
Female Inlet Radial	7955	625569	Inlet Blocking Dia	492 µin	733 µin
Female Outlet Radial	12441	391613	Outlet Blocking Dia	617 µin	975 µin
Male Axial	4980	78689	Max Rotor Body	961 µin	1472 µin
Female Axial	2892	602517	Max allowable deflection	2364 µin	
			Rotor Shaft Fatigue Safety Factor	2.94	2.67

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name
Lead User Name
ProjectReference
Item Screw OpenDate 4/30/2008
Atmospheric Pressure 13.42 psi
Elevation 2500 ft

COMPRESSOR - SGC 3515

Compressor Power	723.3 hp	Compression Ratio	2.16	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	87.8%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.75	Adiabatic Eff	69.4%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	103.5	502.6	1182.2	9685.2	13.947
Discharge	179.5	239.0	502.6	672.3	9685.2	13.947

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	85.3 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	17.7 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	1.9 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	15.8 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	179.5 °F
Upstream Pressure	105.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	78.2 °F

FLUID

Gas	Mole %
Methane	84.367
Ethane	8.299
Propane	3.666
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.200
Molecular Weight	19.69

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name
Lead User Name
ProjectReference
Item Screw OpenDate 4/30/2008
Atmospheric Pressure 13.42 psi
Elevation 2500 ft

COMPRESSOR - SGC 3515

Compressor Power	723.3 hp	Compression Ratio	2.16	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	87.8%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.75	Adiabatic Eff	69.4%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	103.5	502.6	1182.2	9685.2	13.947
Discharge	179.5	239.0	502.6	672.3	9685.2	13.947

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	85.3 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	17.7 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	1.9 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	15.8 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	179.5 °F
Upstream Pressure	105.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	78.2 °F

FLUID

Gas	Mole %
Methane	84.367
Ethane	8.299
Propane	3.666
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.976
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.200
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5897	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	7560	494145	Balance Piston Force	6619.0 lbf	0.0 lbf
Female Inlet Radial	8091	591093	Inlet Blocking Dia	495 µin	743 µin
Female Outlet Radial	12434	392393	Outlet Blocking Dia	622 µin	982 µin
Male Axial	5158	70798	Max Rotor Body	969 µin	1488 µin
Female Axial	2849	630122	Max allowable deflection 2364 µin		
			Rotor Shaft Fatigue Safety Factor	2.93	2.68

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name
Lead User Name
ProjectReference
Item Screw OpenDate 4/30/2008
Atmospheric Pressure 13.42 psi
Elevation 2500 ft

COMPRESSOR - SGC 3515

Compressor Power	710.9 hp	Compression Ratio	1.99	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.1%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.64	Adiabatic Eff	68.2%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	113.5	548.7	1185.8	10572.5	15.224
Discharge	170.6	239.0	548.7	722.5	10572.5	15.224

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	42.1 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	16.1 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	1.6 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	14.5 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	170.6 °F
Upstream Pressure	115.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	76.0 °F

FLUID

Gas	Mole %
Methane	84.379
Ethane	8.300
Propane	3.667
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.186
Molecular Weight	19.69

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 6
Lead User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	710.9 hp	Compression Ratio	1.99	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.1%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.64	Adiabatic Eff	68.2%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	113.5	548.7	1185.8	10572.5	15.224
Discharge	170.6	239.0	548.7	722.5	10572.5	15.224

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	42.1 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	16.1 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	1.6 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	14.5 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	170.6 °F
Upstream Pressure	115.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	76.0 °F

FLUID

Gas	Mole %
Methane	84.379
Ethane	8.300
Propane	3.667
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.186
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5893	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	7664	472222	Balance Piston Force	5935.8 lbf	0.0 lbf
Female Inlet Radial	8232	557963	Inlet Blocking Dia	499 µin	753 µin
Female Outlet Radial	12443	391379	Outlet Blocking Dia	629 µin	990 µin
Male Axial	5339	63860	Max Rotor Body	979 µin	1506 µin
Female Axial	2807	659230	Max allowable deflection	2364 µin	
			Rotor Shaft Fatigue Safety Factor	2.93	2.67

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 7
End User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	690.0 hp	Compression Ratio	1.84	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.3%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.54	Adiabatic Eff	67.1%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	123.5	595.0	1188.9	11465.3	16.510
Discharge	161.5	239.0	595.0	770.7	11465.3	16.510

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	5.3 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	14.5 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	1.2 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	13.3 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	161.5 °F
Upstream Pressure	125.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	74.1 °F

FLUID

Gas	Mole %
Methane	84.389
Ethane	8.301
Propane	3.667
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.174
Molecular Weight	19.69

ERRORS AND WARNINGS

Disclaimer: the information contained in this program is subject to change without notice. Frick reserves the right to final verification of all rating results.



SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name
Lead User Name
ProjectReference
Item Screw OpenDate 4/30/2008
Atmospheric Pressure 13.42 psi
Elevation 2500 ft

COMPRESSOR - SGC 3515

Compressor Power	690.0 hp	Compression Ratio	1.84	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.3%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.54	Adiabatic Eff	67.1%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	123.5	595.0	1188.9	11465.3	16.510
Discharge	161.5	239.0	595.0	770.7	11465.3	16.510

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	5.3 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	14.5 gpm	Main Inj Oil Temp	160.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	1.2 gpm	Bearing Oil Temp	160.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	13.3 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	161.5 °F
Upstream Pressure	125.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	74.1 °F

FLUID

Gas	Mole %
Methane	84.389
Ethane	8.301
Propane	3.667
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.174
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5896	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	7806	444055	Balance Piston Force	5252.3 lbf	0.0 lbf
Female Inlet Radial	8378	526207	Inlet Blocking Dia	505 µin	764 µin
Female Outlet Radial	12470	388562	Outlet Blocking Dia	637 µin	999 µin
Male Axial	5521	57738	Max Rotor Body	993 µin	1524 µin
Female Axial	2764	689933	Max allowable deflection	2364 µin	
			Rotor Shaft Fatigue Safety Factor	2.93	2.67

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 8
Lead User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	661.6 hp	Compression Ratio	1.72	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.5%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.46	Adiabatic Eff	66.1%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	Standard Volume Flow (MMSCFD)
Suction	60.0	133.5	641.6	1191.6	12362.0	17.801
Discharge	151.1	239.0	641.6	815.3	12362.0	17.801

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	0.0 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	11.4 gpm	Main Inj Oil Temp	151.1 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	0.7 gpm	Bearing Oil Temp	151.1 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	10.8 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	151.1 °F
Upstream Pressure	135.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	72.3 °F

FLUID

Gas	Mole %
Methane	84.397
Ethane	8.302
Propane	3.668
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.164
Molecular Weight	19.69

ERRORS AND WARNINGS

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SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 8
Lead User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	661.6 hp	Compression Ratio	1.72	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.5%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.46	Adiabatic Eff	66.1%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	133.5	641.6	1191.6	12362.0	17.801
Discharge	151.1	239.0	641.6	815.3	12362.0	17.801

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	0.0 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	11.4 gpm	Main Inj Oil Temp	151.1 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	0.7 gpm	Bearing Oil Temp	151.1 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	10.8 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	151.1 °F
Upstream Pressure	135.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	72.3 °F

FLUID

Gas	Mole %
Methane	84.397
Ethane	8.302
Propane	3.668
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.164
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5906	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	7988	411323	Balance Piston Force	4568.3 lbf	0.0 lbf
Female Inlet Radial	8529	495842	Inlet Blocking Dia	511 µin	776 µin
Female Outlet Radial	12515	383963	Outlet Blocking Dia	648 µin	1008 µin
Male Axial	5705	52320	Max Rotor Body	1008 µin	1545 µin
Female Axial	2722	722327		Max allowable deflection 2364 µin	
			Rotor Shaft Fatigue Safety Factor	2.94	2.66

ERRORS AND WARNINGS

Disclaimer: the information contained in this program is subject to change without notice. Frick reserves the right to final verification of all rating results.



SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 9
Lead User Name	Item	Atmospheric Pressure	13.42 psi
Project	Screw Open	Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	626.0 hp	Compression Ratio	1.61	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.7%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.39	Adiabatic Eff	65.2%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	Standard Volume Flow (MMSCFD)
Suction	60.0	143.5	688.3	1194.0	13263.1	19.099
Discharge	140.8	239.0	688.3	858.1	13263.1	19.099

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	0.0 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	8.5 gpm	Main Inj Oil Temp	140.8 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	0.0 gpm	Bearing Oil Temp	140.8 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	8.5 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	140.8 °F
Upstream Pressure	145.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	70.7 °F

FLUID

Gas	Mole %
Methane	84.405
Ethane	8.303
Propane	3.668
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.155
Molecular Weight	19.69

ERRORS AND WARNINGS

Oil pressure differential is too low.

Disclaimer: the information contained in this program is subject to change without notice. Frick reserves the right to final verification of all rating results.



SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 9
Lead User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	626.0 hp	Compression Ratio	1.61	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.7%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.39	Adiabatic Eff	65.2%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	(MMSCFD)
Suction	60.0	143.5	688.3	1194.0	13263.1	19.099
Discharge	140.8	239.0	688.3	858.1	13263.1	19.099

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	0.0 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	8.5 gpm	Main Inj Oil Temp	140.8 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	0.0 gpm	Bearing Oil Temp	140.8 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	8.5 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	140.8 °F
Upstream Pressure	145.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	70.7 °F

FLUID

Gas	Mole %
Methane	84.405
Ethane	8.303
Propane	3.668
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.155
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors		
Position	Load lbf	L10 (hrs)		Male	Female
Male Inlet Radial	5923	1000000	Rotor Thrust Direction	Normal	Normal
Male Outlet Radial	8207	375764	Balance Piston Force	3883.9 lbf	0.0 lbf
Female Inlet Radial	8685	466864	Inlet Blocking Dia	518 µin	788 µin
Female Outlet Radial	12578	377627	Outlet Blocking Dia	661 µin	1019 µin
Male Axial	5892	47511	Max Rotor Body	1027 µin	1566 µin
Female Axial	2681	756515	Max allowable deflection	2364 µin	
			Rotor Shaft Fatigue Safety Factor	2.95	2.65

ERRORS AND WARNINGS

Oil pressure differential is too low.

Disclaimer: the information contained in this program is subject to change without notice. Frick reserves the right to final verification of all rating results.



SGC 3515 Open System



CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 10
Lead User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	583.6 hp	Compression Ratio	1.51	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.9%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.33	Adiabatic Eff	64.4%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	Standard Volume Flow (MMSCFD)
Suction	60.0	153.5	735.3	1196.0	14168.8	20.403
Discharge	131.0	239.0	735.3	899.5	14168.8	20.403

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	0.0 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	6.6 gpm	Main Inj Oil Temp	131.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	0.0 gpm	Bearing Oil Temp	131.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	6.6 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	131.0 °F
Upstream Pressure	155.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	69.2 °F

FLUID

Gas	Mole %
Methane	84.412
Ethane	8.304
Propane	3.668
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.148
Molecular Weight	19.69

ERRORS AND WARNINGS

Oil pressure differential is too low.

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SGC 3515 Open System

CoolWare v7.1.1

Registered To: Toromont Energy Systems - James Storoshenko

Customer Name	Reference	Date 4/30/2008	Run # 10
Lead User Name	Item	Screw Open	Atmospheric Pressure 13.42 psi
Project		Elevation	2500 ft

COMPRESSOR - SGC 3515

Compressor Power	583.6 hp	Compression Ratio	1.51	Eff Model	Hydrocarbon Mix
Speed	1200 rpm	Volume Ratio	2.20	Volumetric Eff	88.9%
Percent Suct Vol Flow	100.0%	Ideal Volume Ratio	1.33	Adiabatic Eff	64.4%
		Discharge Port	Standard		

	Temperature (°F)	Pressure (psig)	Mass Flow (lbm/min)	Volume Flow (cfm)	Standard Volume Flow (scfm)	Standard Volume Flow (MMSCFD)
Suction	60.0	153.5	735.3	1196.0	14168.8	20.403
Discharge	131.0	239.0	735.3	899.5	14168.8	20.403

OIL SYSTEM

Oil Type	CP-1516-100	Oil Cooler Heat Rej	0.0 kbtu/hr	Oil Pump Boost	0.0 psi
Oil Flow	6.6 gpm	Main Inj Oil Temp	131.0 °F	Oil System Pres Drop	10.0 psi
Main Inj Oil Flow	0.0 gpm	Bearing Oil Temp	131.0 °F	Main Inj Orifice Dia	0.609 in
Bearing Oil Flow	6.6 gpm	Oil Cooling	All Oil	Main Inj Cv	5.0
Oil Pump Piping	All Oil	Main Inj Valve Pos	5.0%	Main Inj Valve Dia	1.00 in

SYSTEM

Upstream Temperature	60.0 °F	Downstream Temperature	131.0 °F
Upstream Pressure	155.0 psig	Downstream Pressure	232.0 psig
Suct Line Superheat	0.0 °F	Disc Line Desuperheat	0.0 °F
Suct Line Pres Drop	1.5 psi	Disc Line Pres Drop	7.0 psi
		Separator Pres Drop	0.0 psi
		Discharge Dew Point	69.2 °F

FLUID

Gas	Mole %
Methane	84.412
Ethane	8.304
Propane	3.668
n-Butane	0.379
Isobutane	0.478
n-Pentane	0.977
Isopentane	0.239
n-Hexane	0.189
Carbon Dioxide	0.827
Nitrogen	0.379
Water	0.148
Molecular Weight	19.69

COMPRESSOR

Bearings			Rotors	
Position	Load lbf	L10 (hrs)	Male	Female
Male Inlet Radial	5948	1000000	Rotor Thrust Direction	Normal
Male Outlet Radial	8465	339018	Balance Piston Force	3199.0 lbf
Female Inlet Radial	8845	439263	Inlet Blocking Dia	527 µin
Female Outlet Radial	12659	369627	Outlet Blocking Dia	676 µin
Male Axial	6080	43229	Max Rotor Body	1048 µin
Female Axial	2639	792608	Max allowable deflection	2364 µin
			Rotor Shaft Fatigue Safety Factor	2.96
				2.64

ERRORS AND WARNINGS

Oil pressure differential is too low.

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