

***** Confidential Ingersoll-Rand Company Data *****
CENTAC MODEL: C50MX3

File No.	: 11361T1	Date	: mercredi, juillet 20, 2005
Proposal No.	: P-FR-05-152	Frequency	: 50 Hz
Customer	: Michelin	Gas	: Air
User	: G.Descombes	Build ID	: 128

DESIGN POINT PERFORMANCE

INLET CONDITIONS	CAPACITY	DISCHARGE PRESSURE	COUPLING POWER	SPECIFIC kW per m3/hr	ISO EFF %
Pb = 1.013 bar(a)	Inlet m3/hr	bar(g)	kW		
P1 = 0.980 bar(a)	2674.84	9.692	262.99	0.098	66.19
T1 = 35.0 deg C	2711.31	9.692	265.01	0.098	66.58
RH = 60 %	2747.77	9.650	266.93	0.097	66.89
TW = 25.0 deg C	2784.23	9.557	268.73	0.097	67.07
BG = 2971.0 rpm	2820.70	9.398	270.41	0.096	67.10
Mhp = 42.5 kW	2857.16	9.155	271.94	0.095	66.91
REFERENCE CONDITIONS	2893.62	8.808	273.31	0.094	66.42
Ps = 1.013 bar(a)	2930.09	8.332	274.47	0.094	65.53
Ts = 0.0 deg C					
RHs = 0 %	2949.40	8.019	275.07	0.093	64.82
-----Specified Discharge Pressure-----					
GUARANTEE TOLERANCES	2966.55	7.699	275.37	0.093	64.07
Capacity = +/- 4%	3003.01	6.883	275.87	0.092	61.83
Specific Power = +/- 5%	3039.48	5.863	275.72	0.091	58.46

STAGE DATA AT SPECIFIED DISCHARGE PRESSURE

COMPRESSOR STAGES	Stage 1	Stage 2	Stage 3	Disch.
STAGE INLET				
Pressure-bar(a)	0.980	2.003	4.812	9.032
Temperature-deg C	35.000	28.722	33.944	30.778
Capacity-m3/min	48.127	22.709	9.530	4.994
Capacity-kg/s (wet)	0.868	0.860	0.855	0.852
Capacity-kg/s (dry)	0.849	0.849	0.849	0.849
STAGE DISCHARGE				
Pressure-bar(g)	1.023	3.837	8.097	0.0
Temperature-deg C	122.952	133.520	111.146	0.0
Gas Power-kW	77.055	90.227	65.831	0.0
COOLER PERFORMANCE				
Std. Cooler(s) with Copper tubes; Coolant - Water				
Pressure Drop-bar	0.033	0.037	0.078	0.0
CTD-deg C	3.722	8.944	5.778	0.0
Condensate-kg/s (wet)	0.008	0.005	0.003	0.0
Heat Load-Tot kcal/hr	90132.470	85622.219	67461.232	0.0
Cooling Flow-liter/min	135.548	128.755	101.405	0.0
Cooling Temp. Rise-deg C	11.111	11.111	11.111	0.0
STAGE PERFORMANCE PARAMETERS				
Pinion Speed - rpm	49732.000	60202.000	60202.000	0.0
Impeller Diameter - cm	14.732	12.446	10.160	0.0
Adiabatic Efficiency - %	80.985	82.617	79.462	0.0
Pressure Ratio	2.077	2.422	1.893	0.0

COMPRESSOR STABILITY

Stable Pressure Rise - % (For absolute pressure values)	=	18.52
Turndown @ Specified Discharge Pressure - % mass flow	=	23.67
Throttled Capacity before bypass - m3/hr	=	2256.9
Throttled Horsepower @ Coupling - kW	=	228.45
Min. Unloaded Horsepower @ Coupling - kW	=	64.30
Oil Cooler: 26202 kcal/hr, 78.9 liter/min of coolant @ 6 deg C Rise		
Total Heat Load - kcal/hr	=	269418
Total Cooling Flow - liter/min	=	444.6

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DESIGN POINT PERFORMANCE

INLET CONDITIONS	CAPACITY	DISCHARGE PRESSURE	COUPLING POWER	SPECIFIC kW per m3/hr	ISO EFF %
Pb = 1.013 bar(a)	Inlet m3/hr	bar(g)	kW		
P1 = 0.980 bar(a)	2672.23	10.427	277.98	0.104	64.30
T1 = 20.0 deg C	2708.96	10.425	280.14	0.103	64.68
RH = 40 %	2745.68	10.375	282.18	0.103	64.97
TW = 20.0 deg C	2782.41	10.266	284.09	0.102	65.13
BG = 2971.0 rpm	2819.13	10.079	285.86	0.101	65.14
Mhp = 42.5 kW	2855.86	9.794	287.46	0.101	64.92
REFERENCE CONDITIONS	2892.58	9.387	288.87	0.100	64.38
Ps = 1.013 bar(a)	2929.30	8.826	290.04	0.099	63.41
Ts = 0.0 deg C	2966.03	8.080	290.89	0.098	61.83
RHs = 0 %					
		-----Specified Discharge Pressure-----			
GUARANTEE TOLERANCES	2967.39	8.007	291.04	0.098	61.60
Capacity = +/- 4%	3002.75	7.120	291.25	0.097	59.39
Specific Power = +/- 5%	3039.48	5.926	290.70	0.096	55.71

STAGE DATA AT SPECIFIED DISCHARGE PRESSURE

COMPRESSOR STAGES	Stage 1	Stage 2	Stage 3	Disch.
STAGE INLET				
Pressure-bar(a)	0.980	2.070	4.955	9.020
Temperature-deg C	20.000	23.722	28.944	25.778
Capacity-m3/min	48.427	23.215	9.856	5.333
Capacity-kg/s (wet)	0.927	0.927	0.926	0.924
Capacity-kg/s (dry)	0.922	0.922	0.922	0.922
STAGE DISCHARGE				
Pressure-bar(g)	1.092	3.983	8.097	0.0
Temperature-deg C	108.853	128.037	105.544	0.0
Gas Power-kW	82.064	96.361	70.658	0.0
COOLER PERFORMANCE				
Std. Cooler(s) with Copper tubes; Coolant - Water				
Pressure Drop-bar	0.035	0.042	0.090	0.0
CTD-deg C	3.722	8.944	5.778	0.0
Condensate-kg/s (wet)	0.000	0.001	0.003	0.0
Heat Load-Tot kcal/hr	69481.586	82749.127	70395.427	0.0
Cooling Flow-liter/min	104.443	124.424	105.820	0.0
Cooling Temp. Rise-deg C	11.111	11.111	11.111	0.0
STAGE PERFORMANCE PARAMETERS				
Pinion Speed - rpm	49732.000	60202.000	60202.000	0.0
Impeller Diameter - cm	14.732	12.446	10.160	0.0
Adiabatic Efficiency - %	80.524	81.419	74.914	0.0
Pressure Ratio	2.148	2.413	1.839	0.0

COMPRESSOR STABILITY

Stable Pressure Rise - % (For absolute pressure values)	=	26.83
Turndown @ Specified Discharge Pressure - % mass flow	=	29.07
Throttled Capacity before bypass - m3/hr	=	2107.0
Throttled Horsepower @ Coupling - kW	=	228.05
Min. Unloaded Horsepower @ Coupling - kW	=	64.28
Oil Cooler: 26202 kcal/hr, 78.9 liter/min of coolant @ 6 deg C Rise		
Total Heat Load - kcal/hr	=	248828
Total Cooling Flow - liter/min	=	413.6

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DESIGN POINT PERFORMANCE

INLET CONDITIONS	CAPACITY	DISCHARGE	COUPLING	SPECIFIC	ISO
	Inlet	PRESSURE	POWER	kW per	EFF
	m3/hr	bar(g)	kW	m3/hr	%
Pb = 1.013 bar(a)	2727.61	11.559	301.19	0.110	62.90
P1 = 0.980 bar(a)	2761.39	11.556	303.13	0.110	63.27
T1 = 0.0 deg C	2795.16	11.503	304.95	0.109	63.55
RH = 40 %	2828.94	11.386	306.65	0.108	63.73
TW = 10.0 deg C	2862.72	11.185	308.19	0.108	63.76
BG = 2971.0 rpm	2896.50	10.878	309.56	0.107	63.57
Mhp = 42.5 kW	2930.28	10.436	310.74	0.106	63.10
REFERENCE CONDITIONS	2964.06	9.826	311.67	0.105	62.22
Ps = 1.013 bar(a)	2997.84	9.013	312.27	0.104	60.77
Ts = 0.0 deg C					
RHs = 0 %					
	-----Specified Discharge Pressure-----				
GUARANTEE TOLERANCES	3028.73	8.011	312.54	0.103	58.56
Capacity = +/- 4%	3031.62	7.964	312.40	0.103	58.51
Specific Power = +/- 5%	3065.40	6.657	311.66	0.102	55.09

STAGE DATA AT SPECIFIED DISCHARGE PRESSURE

COMPRESSOR STAGES	Stage 1	Stage 2	Stage 3	Disch.
STAGE INLET				
Pressure-bar(a)	0.980	2.133	5.099	9.024
Temperature-deg C	0.000	13.722	18.944	15.778
Capacity-m3/min	49.449	23.863	10.163	5.678
Capacity-kg/s (wet)	1.019	1.019	1.019	1.019
Capacity-kg/s (dry)	1.017	1.017	1.017	1.017
STAGE DISCHARGE				
Pressure-bar(g)	1.158	4.134	8.116	0.0
Temperature-deg C	88.263	117.028	95.046	0.0
Gas Power-kW	89.186	104.438	76.953	0.0
COOLER PERFORMANCE				
Std. Cooler(s) with Copper tubes; Coolant - Water				
Pressure Drop-bar	0.039	0.047	0.106	0.0
CTD-deg C	3.722	8.944	5.778	0.0
Condensate-kg/s (wet)	0.000	0.000	0.000	0.0
Heat Load-Tot kcal/hr	66576.491	87685.284	71503.146	0.0
Cooling Flow-liter/min	99.836	131.550	107.237	0.0
Cooling Temp. Rise-deg C	11.111	11.111	11.111	0.0
STAGE PERFORMANCE PARAMETERS				
Pinion Speed - rpm	49732.000	60202.000	60202.000	0.0
Impeller Diameter - cm	14.732	12.446	10.160	0.0
Adiabatic Efficiency - %	79.103	79.553	69.535	0.0
Pressure Ratio	2.216	2.413	1.790	0.0

COMPRESSOR STABILITY

Stable Pressure Rise - % (For absolute pressure values)	=	39.32
Turndown @ Specified Discharge Pressure - % mass flow	=	35.39
Throttled Capacity before bypass - m3/hr	=	1957.7
Throttled Horsepower @ Coupling - kW	=	228.02
Min. Unloaded Horsepower @ Coupling - kW	=	64.27
Oil Cooler: 26202 kcal/hr, 78.7 liter/min of coolant @ 6 deg C Rise		
Total Heat Load - kcal/hr	=	251967
Total Cooling Flow - liter/min	=	417.4