

RSW

Refrigerant used: CO2.

Hovedresultater (version japan)uten_linker.xls

R744

Steady state[70 10 10](#)[70 15 15](#)[70 20 20](#)

TEST CONDITIONS		Unit	Set value	Set value	Set value
Discharge pressure	bar	70	70	70	
Compressor rotation speed (manual reading)	RPM	1451	1451	1451	
Brine flow (no bypass)	l/min	-	-	-	
Vessel brine inlet temperature at cooling down startup	°C	10	15	20	
Vessel brine inlet temperature at steady state	°C	-1	-1	-1	
Cooling water temperature	°C	10	15	20	
PERFORMANCE		Unit	Value	Value	Value
Cooling capacity, compr or GC	kW	24,7	30,6	21,9	
Power consumption (compressor+pump)	kW	11,5	15,6	15,6	
Power consumption compressor	kW	8,3	12,4	12,4	
COP	-	2,0	1,8	1,3	
COP uten pompe		3,0	2,5	1,8	
EVAPORATOR		Unit	Value	Value	Value
Evaporation temperature (compressor suction)	°C	-7,8	-9,4	-6,7	
Inlet temperature, CO ₂	°C	-6,1	-7,4	-4,6	
Outlet temperature, CO ₂	°C	-3,7	-6,2	-4,4	
Outlet superheat	K	2,5	1,2	0,2	
Pressure drop, CO ₂	kPa	8,6	24,0	34,3	
		10,0	15,0	20,0	
Cooling capacity, CO ₂ (compressor mass flow)	kW	24,7	30,6	25,6	
Cooling capacity, CO ₂ (Gascooler mass flow)	kW	26,2	28,2	N.A	
Cooling capacity, brine	kW	22,5	27,7	21,0	
Cooling capacity, electric	kW	21,9	27,7	21,9	
Inlet temperature, brine	°C	0,3	-0,5	0,0	
Outlet temperature, brine	°C	-0,3	-1,3	-0,6	
Flow brine	l/min	562	560	562,1	
Temperature, brine reservoir inlet	°C	-0,7	-1,6	-1,1	
Temperature, brine reservoir outlet	°C	-0,4	-1,3	-0,8	
LMTD	°C	7,4	8,1	5,9	
Overall heat transfer coefficient (CO ₂ area)	W/m ² K	893	998	1038,8	
Overall heat transfer coefficient (H ₂ O area)	W/m ² K	997,5	1115,5	1160,7	
Cooling down time from 10 to -1°C	min			-	
Refrigerant level	%	50	53	58,1	
COMPRESSOR		Unit	Value	Value	Value
Suction pressure	bara	28,2	26,9	29,1	
Discharge pressure	bara	70,3	68,6	69,7	
Suction temperature, CO ₂	°C	-2,6	-5,5	-3,8	
Discharge temperature, CO ₂	°C	82,6	80,9	75,4	
Suction superheat	K	5,2	3,9	2,9	
Power consumption	kW	8,3	12,4	12,4	
Power consumption, calculated	kW	8,4	11,6		
Rotation frequency	RPM	1020	1451	1451,0	
Flow CO ₂ , calculated (RPM, vol.eff, density)	kg/min	7,50	10,15	11,4	
GAS COOLER, Water		Unit	Value	Value	Value
Pressure drop	kPa	49,9	99,3	125,7	
Inlet temperature, CO ₂	°C	81,0	79,6	74,2	
Outlet temperature, CO ₂	°C	11,6	24,4	28,9	
Inlet temperature, throttle valve	°C	12,9	24,9	28,3	
Inlet temperature, water	°C	10,0	14,6	20,2	
Outlet temperature, water	°C	18,5	25,1	28,5	
Temperature Approach, CO ₂ outlet	K	1,6	9,9	8,7	
Flow water	kg/h	3305	3499	3747,6	
Capacity, water heating	kW	32,6	43,0	36,1	
Flow CO ₂ , calculated (heat balance)	kg/min	7,06	10,99		

Varmebalanse

kW

70bar

-0,4

0,0

-1,9