

RSW

Refrigerant used: CO₂.

Hovedresultater (version japan)uten_linker.xls

R744

Ikke helt stabilt

Steady state

[90 ss 15](#)

[90 ss 20](#)

[90 ss 25](#)

TEST CONDITIONS		Unit	Set value	Set value	Set value
Discharge pressure		bar	90	90	90
Compressor rotation speed (manual reading)		RPM	1451	-	-
Brine flow (no bypass)		l/min	-	-	-
Vessel brine inlet temperature at cooling down startup		°C	-	-	-
Vessel brine inlet temperature at steady state		°C	-1	-1	-1
Cooling water temperature		°C	15	15	15
PERFORMANCE		Unit	Value	Value	Value
Cooling capacity, brine side		kW	26,9	27,7	26,6
Power consumption (compressor+pump)		kW	16,7	17,9	18,6
Power consumption compressor		kW	13,5	14,8	15,5
COP		-	1,42	1,36	1,25
COP without pump			1,99	1,87	1,72
EVAPORATOR		Unit	Value	Value	Value
Evaporation temperature (compressor suction)		°C	-8,7	-8,7	-8,2
Inlet temperature, CO ₂		°C	-6,8	-6,7	-6,2
Outlet temperature, CO ₂		°C	-4,4	-4,7	-4,6
Outlet superheat		K	2,4	2,0	1,6
Pressure drop, CO ₂		kPa	10,8	14,9	17,5
			15,0	20,0	25,0
Cooling capacity, CO ₂ (gascooler mass flow)		kW	26,9	27,7	26,6
Cooling capacity CO ₂ , (compressor mass flow)		kW	28,5	28,1	26,3
Cooling capacity, brine		kW	23,6	24,3	23,2
Cooling capacity, electric		kW	27,5	27,2	25,2
Inlet temperature, brine		°C	0,0	0,0	0,0
Outlet temperature, brine		°C	-0,6	-0,6	-0,6
Flow brine		l/min	568	566	566
Temperature, brine reservoir inlet		°C	-1,1	-1,2	-1,2
Temperature, brine reservoir outlet		°C	-0,9	-0,9	-0,8
LMTD		°C	7,9	7,7	7,3
Overall heat transfer coefficient (CO ₂ area)		W/m ² K	1005	920	1066
Overall heat transfer coefficient (H ₂ O area)		W/m ² K	1122,5	1028,3	1190,7
Cooling down time from 10 to -1°C		min		-	
Refrigerant liquid level		%	45	49	50
COMPRESSOR		Unit	Value	Value	Value
Suction pressure		bara	27,5	27,5	27,9
Discharge pressure		bara	89,7	89,4	89,7
Suction temperature, CO ₂		°C	-3,3	-3,5	-3,5
Discharge temperature, CO ₂		°C	114,1	114,9	113,3
Suction superheat		K	5,3	5,2	4,7
Power consumption		kW	13,5	14,8	15,5
Power consumption, calculated		kW	12,4	13,2	13,7
Rotation frequency		RPM	1320	1410	1451
Flow CO ₂ , calculated (RPM, vol.eff, density)		kg/min	8,41	9,01	9,49
GAS COOLER, Water		Unit	Value	Value	Value
Pressure drop		kPa	54,6	64,5	73,7
Inlet temperature, CO ₂		°C	112,2	113,1	111,7
Outlet temperature, CO ₂		°C	16,4	21,7	28,3
Inlet temperature, throttle valve		°C	16,6	22,1	28,5
Inlet temperature, water		°C	14,9	19,7	25,4
Outlet temperature, water		°C	26,3	31,2	36,1
Temperature Approach, CO ₂ outlet		K	1,5	2,0	2,9
Flow, water		kg/h	2930	3092	3334
Capacity, water heating		kW	38,9	41,4	41,2
Flow CO ₂ , calculated (heat balance)		kg/min	7,95	8,86	9,61

Varmebalance

kW

90bar

-1,5

-1,0

-0,8