Selection: Open Screw Compressors OS

Input Values

Compressor model	OSKA95103-K	Speed	2900 /min
Refrigerant	R717	Useful superheat	100%
Reference temperature	Dew point temp.	Additional cooling	Automatic
Liq. subc. (in condenser)	0 K	Max. discharge gas temp.	80,0 °C
Suct. gas superheat	1,00 K	Cooling capacity	100 %
Operating mode	Standard		

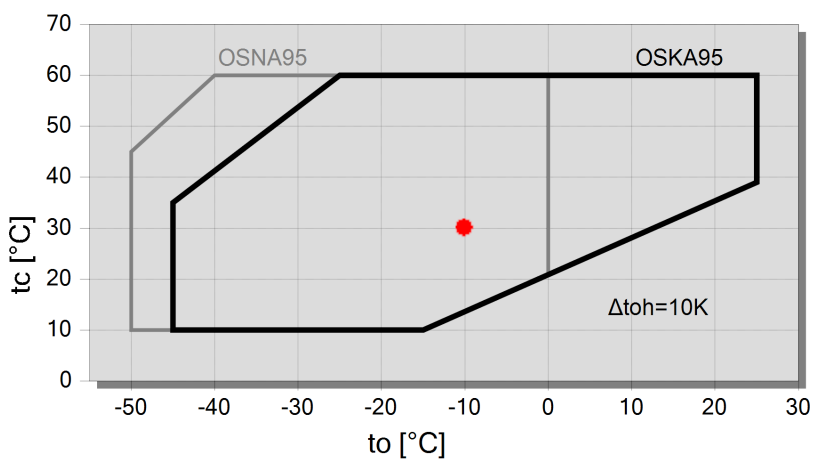
Result

Q [W]	Cooling capacity	Qac [kW]	Additional cooling
P [kW]	Power input	tcu [°C]	Liquid temp.
COP [-]	COP/EER	pm [bar(a)]	ECO pressure
mLP [kg/h]	Mass flow LP	Qsc [kW]	sub cooler capacity (ECO)
mHP [kg/h]	Mass flow HP		

tc	to	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C
30°C	Q [W]	1455353	1220692	1016263	839166	686690	556305	445657	352562
	P [kW]	149,2	153,2	154,5	153,3	150,1	145,2	139,1	132,1
	COP [-]	9,75	7,97	6,58	5,47	4,58	3,83	3,20	2,67
	mLP [kg/h]	4626	3896	3258	2703	2224	1812	1460	1163
	mHP [kg/h]	4626	3896	3258	2703	2224	1812	1460	1163
	Qac [kW]	9,87	20,3	30,9	40,9	50,1	58,0	64,5	70,2
	tcu [°C]	30,0	30,0	30,0	30,0	30,0	30,0	30,0	30,0
	pm [bar(a)]	--	--	--	--	--	--	--	--
	Qsc [kW]	--	--	--	--	--	--	--	--
40°C	Q [W]	1381546	1156470	960451	790714	644668	519902	414179	325438
	P [kW]	205	205	201	195,6	188,2	179,6	170,4	161,1
	COP [-]	6,73	5,65	4,77	4,04	3,43	2,89	2,43	2,02
	mLP [kg/h]	4585	3854	3216	2661	2181	1770	1419	1122
	mHP [kg/h]	4585	3854	3216	2661	2181	1770	1419	1122
	Qac [kW]	49,5	60,9	72,2	84,8	93,8	100,0	103,9	106,3
	tcu [°C]	40,0	40,0	40,0	40,0	40,0	40,0	40,0	40,0
	pm [bar(a)]	--	--	--	--	--	--	--	--
	Qsc [kW]	--	--	--	--	--	--	--	--
50°C	Q [W]	1306529	1090936	903296	740966	601493	482602	382203	298398
	P [kW]	264	259	251	241	230	218	206	194,9
	COP [-]	4,95	4,21	3,59	3,07	2,62	2,22	1,86	1,53
	mLP [kg/h]	4540	3807	3168	2613	2133	1722	1373	1079
	mHP [kg/h]	4540	3807	3168	2613	2133	1722	1373	1079
	Qac [kW]	120,3	133,9	142,6	147,5	149,7	150,0	149,3	148,5
	tcu [°C]	50,0	50,0	50,0	50,0	50,0	50,0	50,0	50,0
	pm [bar(a)]	--	--	--	--	--	--	--	--
	Qsc [kW]	--	--	--	--	--	--	--	--

-- No calculation possible (see message in single point selection)
*According to EN12900 (5K suction gas superheat, 0K liquid subcooling)

Application Limits Standard OSKA95103

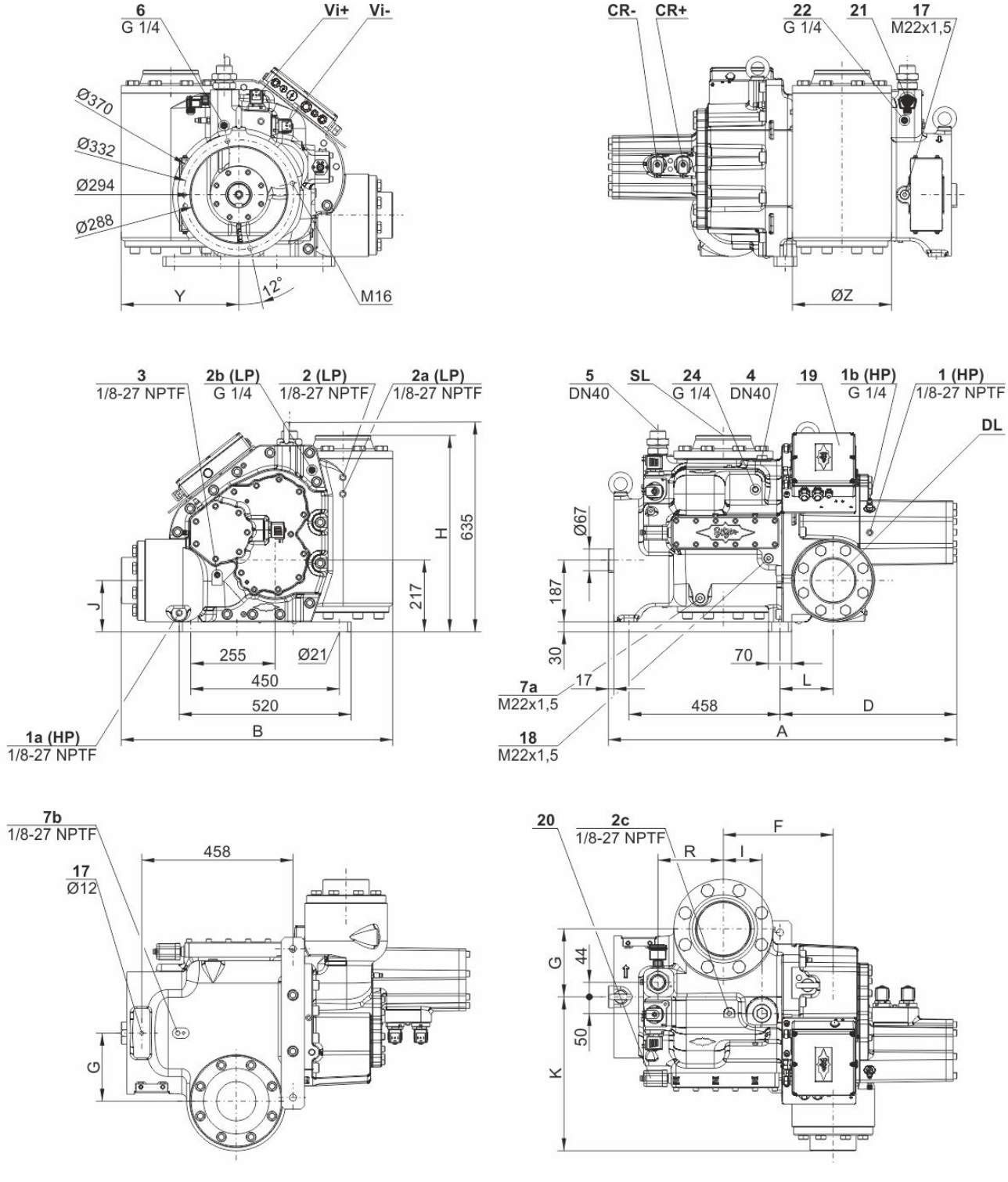

70
60
50
40
30
20
10
0
tc [°C]
OSNA95
OSKA95
Δtoh=10K
-50
-40
-30
-20
-10
0
10
20
30
to [°C]

Legend

A

Technical Data: OSKA95103-K

Dimensions and Connections



Type	A	B	D	F	G	H	I	J	K	L	R	Y	ØZ	SL	DL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
OSKA9573, OSKA9583, OSNA9583	1050	730	531	360	176	585	142	144	434	164	154	296	240	DN125	DN100
OSKA9593, OSKA95103, OSNA95103	1055	821	536	332	206	594	117	155	465	161	198	356	300	DN150	DN125

Technical Data

Technical Data	
Displacement (2900 RPM 50 Hz)	1015 m³/h
Displacement (3500 RPM 60 Hz)	1225 m³/h
Allowed speed range	1500 .. 4000
Sens of rotation (compressor)	links / counter-clockwise
Weight	660 kg
Max. pressure (LP/HP)	19 / 32 bar
Connection suction line (NH3)	DN 150
Connection discharge line (NH3)	DN 125
Adapter for ECO (NH3)	DN 40 (Option)
Oil type NH3	Reniso KC68 , SHC 226E
Extent of delivery (Standard)	
Pressure relief valve	Standard
Check valve	Standard
Oil flow control	OLC-D1 & CM-SW-01
Discharge gas temperature sensor	PT1000 & CM-SW-01
Start unloading	CM-SW-01
Capacity control	100-10% (stepless, CM-SW-01)
Protective charge	Standard
automatic Vi-adaption	CM-SW-01
application limit monitoring	CM-SW-01
Available Options	
Discharge shut-off valve	Option
ECO connection with shut-off valve	Option
Coupling housing	Option
Oil injection kit	Option

Open Screw Compressors OS

OSK = Application for air.conditioning and medium temperature cooling.
OSN = Application for low temperature cooling.
OSH = Application for air-conditioning and heat pumps.

Notes regarding application limits (see "T.Data - Limits")

* Ranges are valid for standart operation and at full-load conditions.

* With high pressure conditions, part-laod operation is partly limited (see application limits in applications manual SH-500/ SH-510).

* With Economizer operation the maximum admissible evaporation temperature is shifted by 10K downward (otherwise there is a danger of excessive compression and overlaod of the motor because of a higher mass flow). At pull-down conditions from higher evaporation temperatures, the ECO injection must remain closed until the evaporation temperature is below the maximum admissible value and a stable operation is achieved (e.g. control of the ECO solenoid valve by means of a low pressure cut-out). The use of the ECO-System with higher evaporation temperatures requires individual consultation with Bitzer.

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* Capacity control with ECO operation at the same time is limited to one single regulating step (CR 75%). At CR 50% the ECO injection should be closed.

* Combined operation (ECO + CR 50%) is possible under certain conditions, control and system design, however, require individual consultation with Bitzer.

Motor Selection

The required driving motor is selected for starting conditions at direct start as well as at star-delta-start with start unloading (50% capcaity regulation). The starting conditions refer to the following defined operation points resp. to the maximum application limit of the compressor. Should the evaporation- or the condensing temperature of the plant be higher at the start, an individual motor selection is necessary.

Evaporation temperature for motor selection				
	HH	H	M	L
R134a	+20 °C	+12,5 °C	-5 °C	
R404A / R507A		+7,5 °C	-5 °C	-15 °C
R22		+12,5 °C	-5 °C	-10 °C
R407C		+12,5 °C	-5 °C	
NH_3	+25 °C	+12,5 °C	-5 °C	-10 °C

The stated motor data refer to IEC motors at which the pull-up torque should not fall below 90% of the max. torque. In addition the following starting torque (referring to direct start) must be reached:

* open screw compressors 120%

Should the motor not fulfil these criteria, an individual selection is also necessary.

Lubricants and additional cooling for NH3 applications

	Type	Viscosity	Discharge gas (°C)	Oil injection (°C)
Reniso KM32	MO	32	ca. 60 .. max. 100	max. 50
Reniso KS46	MO	46	ca. 60 .. max. 80 (100 [1])	max. 60
Reniso KC68	MO	68	ca. 60 .. max. 80 (100 [1])	max. 60
Reflo 68A	MO (HT)	58	ca. 60 .. max. 80 (100 [1])	max. 60
SHC226E	PAO	68	ca. 60 .. max. 80 (100 [1])	max. 60

[1] 100°C only after consultation with BITZER

Further information on the selection of lubricants can be found in the Application Manuals SH-500 and SH-510.

Legend of connection positions according to "Dimensions":

1 High pressure connection (HP)
Connection for high pressure switch (HP)
1a Additional high pressure connection (HP)
Not suitable for pressure switch or pressure transmitter!
1b Connection for high pressure transmitter (HP)
2 Low pressure connection (LP)
Connection for low pressure switch
2a Additional low pressure connection (LP)
2b Connection for low pressure transmitter (LP)
2c Low pressure connection for the minimum pressure differential control valve
3 Connection for discharge gas temperature sensor (HP)
4 Connection for economiser (ECO)
HS.85: ECO valve with connection line (option)
OS.85, OS.95, OS.105, HS.95: ECO valve (option)
5 Connection/valve for oil injection
6 Oil pressure connection
7 Oil drain (compressor or motor housing)
7a Oil drain (suction gas filter)
7b Oil drain from shaft seal (maintenance connection)
7c Oil drain hose (shaft seal)
8 Threaded bore for foot fastening
9 Threaded bore for pipe fixture (ECO and LI lines)
10 Maintenance connection for oil filter
11 Oil drain (oil filter)
13 Oil filter monitoring
14 Oil flow switch
15 Earth screw for housing
16 Pressure blow-off (oil filter chamber)
17 Maintenance connection for shaft seal
18 Liquid injection (LI)
19 Compressor module
20 Slider position indicator
21 Oil level switch
22 Oil pressure transmitter
23 Connection for oil and gas return (for systems with flooded evaporator adaptor optional)
24 Access to oil circulation restrictor
25 Oil inlet for shaft seal cooling
26 Oil outlet for shaft seal cooling
27 Temperature sensor in the shaft seal
28 Vibration sensor connection
SL Suction gas line
DL Discharge gas line

Dimensions can show tolerances according to EN ISO 13920-B.