Compressor Selection: Semi-hermetic Screw Compressors HS

Input Values

Compressor model	HSN6451-40	Operating mode	Standard
Refrigerant	R404A	Power supply	400V-3-50Hz
Reference temperature	Dew point temp.	Useful superheat	100%
Liq. subc. (in condenser)	0 K	Additional cooling	Automatic
Suct. gas superheat	10,00 K	Max. discharge gas temp.	80,0 °C

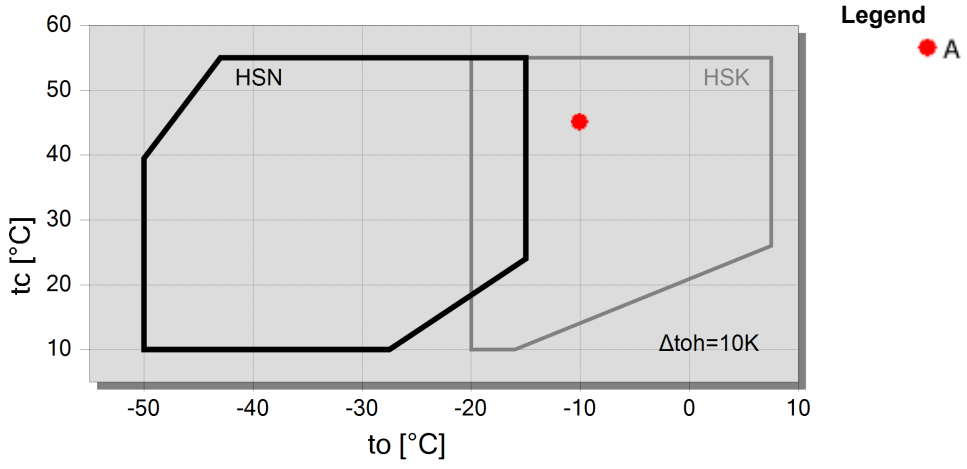
Result

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

tc	to	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C	-50°C
30°C	Q [W]	75938	61332	48966	38569	29890	22706	16812	12026
	P [kW]	28,2	26,5	25,0	23,7	22,5	21,4	20,5	19,60
	I [A]	48,2	45,9	43,9	42,1	40,5	39,1	37,9	36,8
	COP [-]	2,69	2,31	1,95	1,63	1,33	1,06	0,82	0,61
	mLP [kg/h]	2219	1837	1504	1217	970	758	579	427
	mHP [kg/h]	2219	1837	1504	1217	970	758	579	427
	Qac [kW]	--	--	--	--	--	3,73	6,45	8,89
	tcu [°C]	29,6	29,6	29,6	29,6	29,6	29,6	29,6	29,6
	pm [bar(a)]	--	--	--	--	--	--	--	--
	Qsc [kW]	--	--	--	--	--	--	--	--
40°C	Q [W]	65040	52162	41329	32285	24801	18668	13697	--
	P [kW]	32,7	31,1	29,5	28,1	26,9	25,7	24,7	
	I [A]	54,4	52,1	50,0	48,1	46,4	44,8	43,5	
	COP [-]	1,99	1,68	1,40	1,15	0,92	0,73	0,55	
	mLP [kg/h]	2187	1804	1473	1187	942	733	557	
	mHP [kg/h]	2187	1804	1473	1187	942	733	557	
	Qac [kW]	--	--	--	4,13	6,99	9,61	11,99	
	tcu [°C]	39,6	39,6	39,6	39,6	39,6	39,6	39,6	
	pm [bar(a)]	--	--	--	--	--	--	--	
	Qsc [kW]	--	--	--	--	--	--	--	
50°C	Q [W]	52732	41812	32700	25163	18992	13997	10008	--
	P [kW]	38,7	37,0	35,5	34,0	32,8	31,6	30,5	
	I [A]	62,9	60,4	58,2	56,2	54,5	52,8	51,3	
	COP [-]	1,36	1,13	0,92	0,74	0,58	0,44	0,33	
	mLP [kg/h]	2117	1737	1408	1125	883	679	507	
	mHP [kg/h]	2117	1737	1408	1125	883	679	507	
	Qac [kW]	5,06	7,97	10,74	13,33	15,73	17,90	19,83	
	tcu [°C]	49,7	49,7	49,7	49,7	49,7	49,7	49,7	
	pm [bar(a)]	--	--	--	--	--	--	--	
	Qsc [kW]	--	--	--	--	--	--	--	

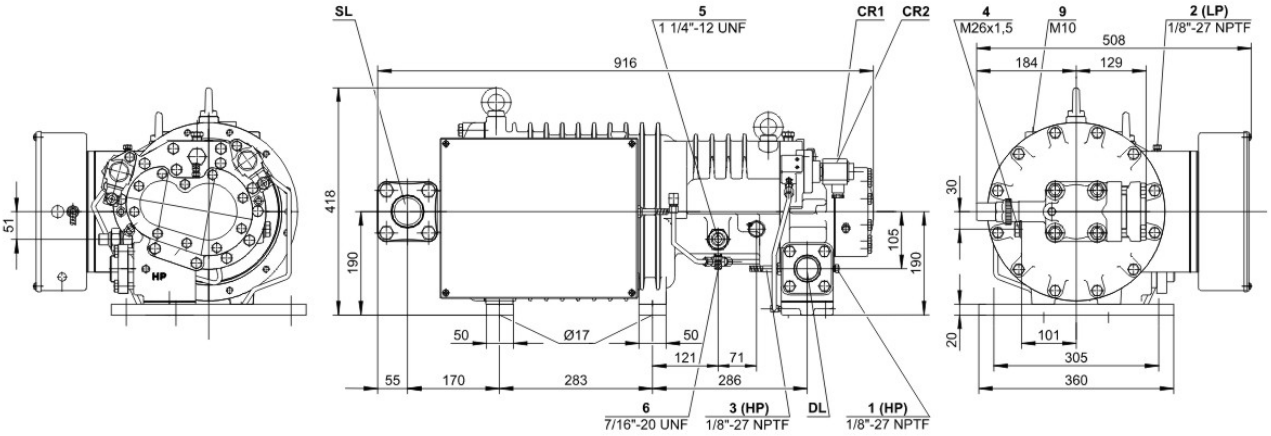
-- No calculation possible (see message in single point selection)
*According to EN12900 (10K suction gas superheat, 0K liquid subcooling)

Application Limits Standard



Technical Data: HSN6451-40

Dimensions and Connections



Technical Data

Technical Data	
Displacement (2900 RPM 50 Hz)	140 m³/h
Displacement (3500 RPM 60 Hz)	168 m³/h
Weight	234 kg
Max. pressure (LP/HP)	19 / 28 bar
Connection suction line	54 mm - 2 1/8"
Connection discharge line	42 mm - 1 5/8"
Adapter/shut-off valve for ECO	22 mm - 7/8" (Option)
Oil type R22	B150SH, B100 (Option)
Oil type R134a/R404A/R507A/R407A/R407F/R448A/R449A	BSE170 (Option)
Motor data	
Motor voltage (more on request)	380-415V PW-3-50Hz
Max operating current	65.0 A
Starting current (Rotor locked)	187.0 A D / 313.0 A DD
Max. Power input	42,0 kW
Extent of delivery (Standard)	
Discharge gas temperature sensor	Standard
Start unloading	Standard
Oil flow control	SE-B2 (Standard)
Motor protection	SE-E1 (Standard), SE-E3 (Standard for 660-690V)
Suction shut-off valve	Standard
Capacity control	100-75-50% (Standard)
Enclosure class	IP54
Available Options	
Discharge shut-off valve	Option
ECO connection with shut-off valve	Option
Motor protection	SE-C1 (Option)
Sound measurement	
Sound power level (-35°C / 40°C)	86,5 dB(A)
Sound pressure level @ 1m (-35°C / 40°C)	78,5 dB(A)

Semi-hermetic Screw Compressors HS

HSK = Application for air-conditioning and medium temperature cooling.
HSN = Application for low temperature cooling.

Notes regarding application limits (see "Limits")

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

* With high pressure conditions, part-load operation is partly limited (see application limits in applications manual SH-100).

* With Economizer operation the maximum admissible evaporation temperature is shifted by 10 K downward (otherwise there is a danger of excessive compression and overload 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.

Data for sound emission

Data are based on 50 Hz application (IP-units 60 Hz) and R404A.
Sound pressure level: values are based on open air test sites with semi-spherical sound emissions at 1 meter distance. For further information see Technical Information "Sound Data".

Legend of connection positions according to "Dimensions":

1 High pressure connection (HP)
1a Additional high pressure connection
1b Connection for high pressure transmitter (HP)
2 Low pressure connection (LP)
2a Additional low pressure transmitter (LP)
2b Connection for low pressure transmitter (LP)
3 Discharge gas temperature sensor connection (HP)
4 Connection for economiser (ECO) or liquid injection (LI)
HS.85 and OS.85: connection for economiser (ECO)
HS.85: ECO valve with connection pipe (option)
OS.85: ECO valv (option)
5 Oil injection connection
6 Oil pressure connection for HS.85 and OS.85:
Oil drain (compressor housing)
7 Oil drain (motor housing)
7a Oil drain (suction gas filter)
7b Oil drain out of shaft seal (maitenance connection)
7c Oil drain tube (shaft seal)
8 Threaded bore for foot fastening
9 Threaded bore for pipe support (ECO and LI line)
10 Maitenance connection (oil filter)
11 Oil drain (oil filter)
12 Monitoring of oil stop valve
OS.85: Monitoring rotation direction and oil stop valve
13 Oil filter monitoring
14 Oil flow switch
15 Earth screw for housing
16 Pressure relief (oil filter chamber)
17 Maitenance connection for shaft seal
18 Liquid injection (LI)
19 Control module
20 Slider position indicator
SL Suction gas line
DL Discharge gas line
Dimensions can show tolerances according to EN ISO 13920-B.