



## Selection: Semi-hermetic Screw Compressors HS

### Input Values

Compressor model	HSN7451-60	Operating mode	Economiser
Refrigerant	R404A	Power supply	400V-3-50Hz
Reference temperature	Dew point temp.	Useful superheat	100%
Liq. subc. (in condenser)	0 K	Additional cooling	Automatic
Auto. subcooling	Auto	Max. discharge gas temp.	80,0 °C
Suct. gas superheat	10,00 K		

### Result

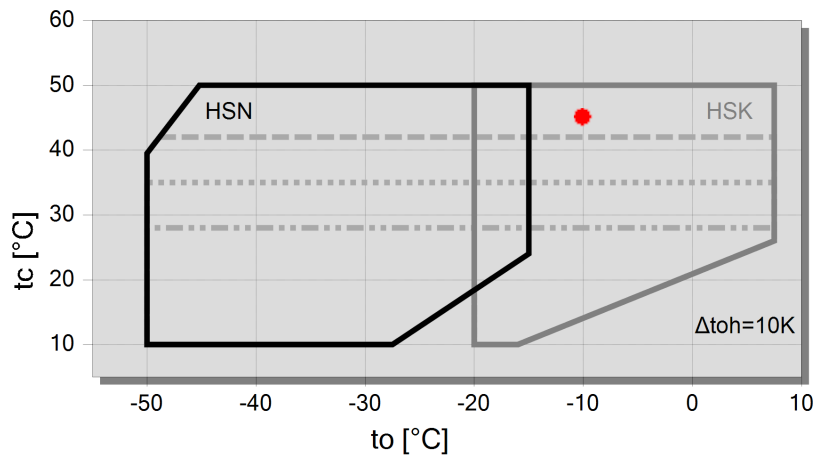
Q [W]	Cooling capacity	mHP [kg/h]	Mass flow HP
P [kW]	Power input	Qac [kW]	Additional cooling
I [A]	Current	tcu [°C]	Liquid temp.
COP [-]	COP/EER	pm [bar(a)]	ECO pressure
mLP [kg/h]	Mass flow LP	Qsc [kW]	sub cooler capacity (ECO)

tc	to	-15°C	-20°C	-25°C	-30°C	-35°C	-40°C	-45°C	-50°C
<b>30°C</b>	Q [W]	132259	110638	91670	75076	60603	48026	37141	27768
	P [kW]	45,1	42,8	41,2	40,1	39,0	37,9	36,4	34,3
	I [A]	73,0	69,7	67,4	65,7	64,2	62,6	60,4	57,4
	COP [-]	2,93	2,58	2,22	1,87	1,55	1,27	1,02	0,81
	mLP [kg/h]	3246	2682	2192	1768	1404	1093	829	608
	mHP [kg/h]	3814	3256	2754	2304	1900	1540	1219	934
	Qac [kW]	--	--	--	--	--	3,95	8,60	12,17
	tcu [°C]	13,98	10,63	7,06	3,24	-0,84	-5,16	-9,74	-14,59
	pm [bar(a)]	6,84	6,17	5,50	4,85	4,22	3,62	3,06	2,54
Qsc [kW]	21,2	21,1	20,3	19,05	17,33	15,30	13,04	10,65	
<b>40°C</b>	Q [W]	121081	101393	84104	68952	55709	44173	34168	--
	P [kW]	54,1	52,4	51,1	50,0	48,9	47,6	46,1	
	I [A]	86,4	83,8	81,9	80,2	78,6	76,8	74,4	
	COP [-]	2,24	1,94	1,65	1,38	1,14	0,93	0,74	
	mLP [kg/h]	3152	2598	2117	1703	1347	1045	789	
	mHP [kg/h]	3965	3392	2876	2413	1996	1622	1288	
	Qac [kW]	--	--	--	4,58	10,04	14,96	19,11	
	tcu [°C]	19,68	16,16	12,35	8,25	3,86	-0,83	-5,83	
	pm [bar(a)]	8,12	7,31	6,51	5,72	4,95	4,22	3,53	
Qsc [kW]	27,3	26,3	24,7	22,6	20,2	17,58	14,78		
<b>50°C</b>	Q [W]	--	--	74203	60847	49102	38803	29806	--
	P [kW]			63,9	62,5	61,1	59,7	58,4	
	I [A]			101,7	99,4	97,1	94,9	92,9	
	COP [-]			1,16	0,97	0,80	0,65	0,51	
	mLP [kg/h]			1989	1591	1249	959	714	
	mHP [kg/h]			2969	2496	2068	1681	1331	
	Qac [kW]			17,24	21,8	26,1	30,1	33,7	
	tcu [°C]			18,32	13,87	9,06	3,88	-1,70	
	pm [bar(a)]			7,80	6,82	5,87	4,95	4,09	
Qsc [kW]			28,0	25,3	22,2	19,02	15,71		

-- No calculation possible (see message in single point selection)

\*According to EN12900 (10K suction gas superheat, liquid subcooling in Economiser with 5K temperature difference)

## Application Limits ECO HSN7451-60



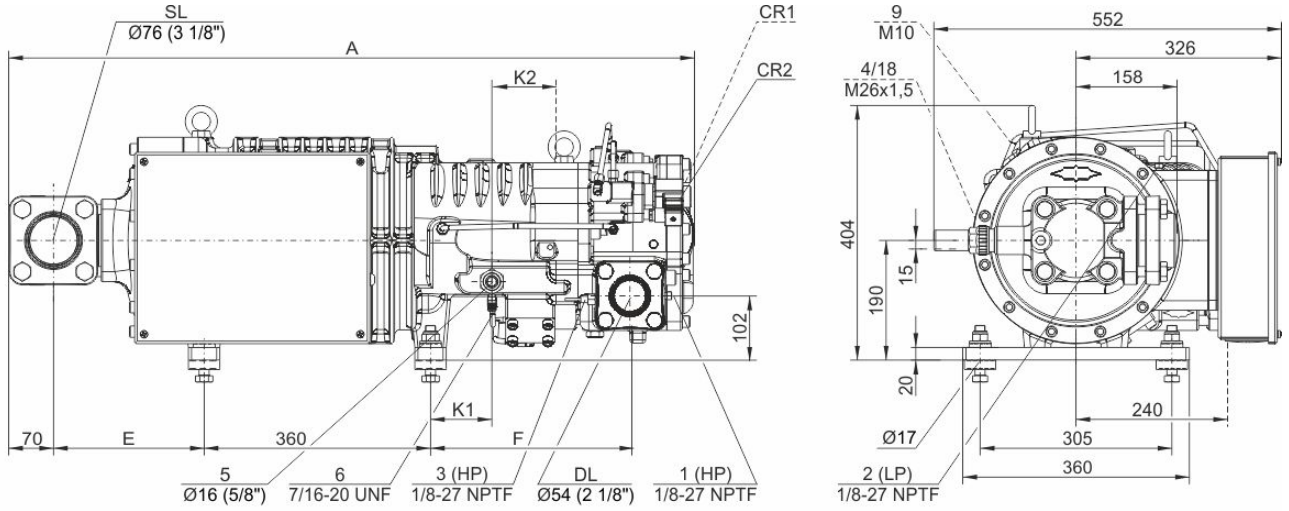
**Legend**

- max. tc for frequencies = 20Hz
- .... max. tc for frequencies = 25Hz
- . - max. tc for frequencies = 35Hz
- A



## Technical Data: HSN7451-60

### Dimensions and Connections



Model	A	E	F	K1	K2
	mm	mm	mm	mm	mm
HS.7451, HS.7461	1021	186	295	76	109
HSK7471-70, HSN7471-75	1034	186	318	98	97
HSK7471-90	1087	238	318	98	97



## Technical Data

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Displacement (2900 RPM 50 Hz)	192 m <sup>3</sup> /h
Displacement (3500 RPM 60 Hz)	232 m <sup>3</sup> /h
Weight	297 kg
Max. pressure (LP/HP)	19 / 28 bar
Connection suction line	76 mm - 3 1/8"
Connection discharge line	54 mm - 2 1/8"
Adapter/shut-off valve for ECO	22 mm - 7/8" (Option)
Oil type R22	B150SH, B100 (Option)
Oil type R134a/R404A/R507A/R407A/R407F	BSE170
Oil type R448A/R449A/R454C	BSE170

### Motor data

Motor version	1
Motor voltage (more on request)	380-415V PW-3-50Hz
Max operating current	98.0 A
Starting current (Rotor locked)	267.0 A D / 449.0 A DD
Max. Power input	65,0 kW

### Extent of delivery (Standard)

Discharge gas temperature sensor	Standard
Start unloading	Standard
Oil flow control	SE-B3 (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-i1 (200-690V)

### 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 10K 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.

### HS 64/74

- \* 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.

### Data for sound emission

Data are based on 50Hz application (IP-units 60Hz) 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)  
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.