Selection: Semi-hermetic Reciprocating Compressors

Input Values

Compressor model	(4HTC-20K)	Suct. gas superheat	10,00 K
Mode	Refrigeration and Air conditioning	Operating mode	Transcritical
Refrigerant	R744	Power supply	400V-3-50Hz
Reference temperature	Dew point temp.	Capacity control	100%
Gas cooling outlet	25,0 °C	Useful superheat	100%

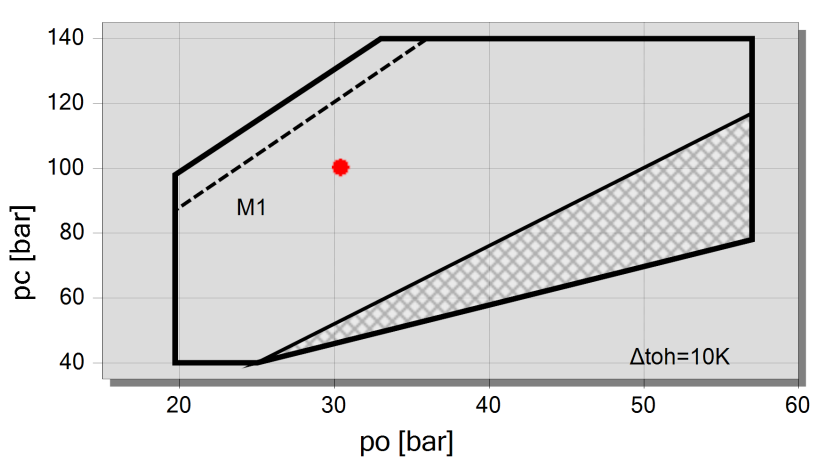
Result

Q [W]	Cooling capacity	COP [-]	COP/EER
Qu* [W]	Evaporator capacity	m [kg/h]	Mass flow
P [kW]	Power input	Op.	Operating mode
I [A]	Current	th [°C]	Discharge gas temp. w/o cooling
Qc [W]	Condenser capacity		

Pc	to	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C
80bar(a)	Q [W]	62876	53273	44834	37456	30992	25266	20079	--
	Qu* [W]	62876	53273	44834	37456	30992	25266	20079	
	P [kW]	12,04	12,57	12,85	12,90	12,72	12,33	11,74	
	I [A]	21,3	22,0	22,4	22,5	22,2	21,7	20,8	
	Qc [W]	74918	65847	57689	50353	43709	37591	31816	
	COP [-]	5,22	4,24	3,49	2,90	2,44	2,05	1,71	
	m [kg/h]	1254	1050	876	727	600	488	388	
	Op.	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical	
	th [°C]	71,4	78,2	85,8	94,4	104,2	115,6	129,9	
90bar(a)	Q [W]	62276	52596	44111	36711	30244	24526	19353	--
	Qu* [W]	62276	52596	44111	36711	30244	24526	19353	
	P [kW]	14,10	14,40	14,46	14,27	13,87	13,25	12,44	
	I [A]	24,2	24,7	24,8	24,5	23,9	23,0	21,8	
	Qc [W]	76377	66999	58566	50983	44111	37778	31795	
	COP [-]	4,42	3,65	3,05	2,57	2,18	1,85	1,56	
	m [kg/h]	1216	1015	844	698	573	465	367	
	Op.	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical	
	th [°C]	82,3	89,6	97,8	107,1	117,6	129,9	145,3	
100bar(a)	Q [W]	61351	51655	43176	35800	29369	23693	--	--
	Qu* [W]	61351	51655	43176	35800	29369	23693		
	P [kW]	15,98	16,06	15,89	15,49	14,87	14,04		
	I [A]	27,1	27,2	26,9	26,3	25,4	24,1		
	Qc [W]	77331	67715	59069	51292	44238	37733		
	COP [-]	3,84	3,22	2,72	2,31	1,98	1,69		
	m [kg/h]	1180	982	814	671	549	442		
	Op.	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical	Transcritical		
	th [°C]	92,5	100,3	109,2	119,1	130,3	143,4		

-- No calculation possible (see message in single point selection)
*according to EN12900 (10K suction gas superheat)

Application Limits 100% 4HTC-20K



Legend

mind operating parameters

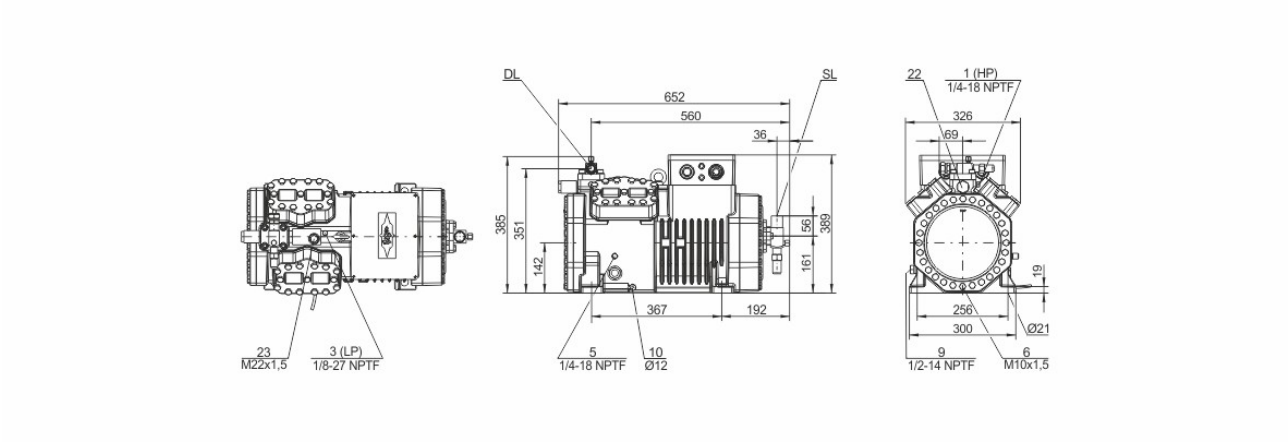
M1: motor 1

Operation above designated line not allowed for following compressor models: 4PTE, 4PTC

A

Technical Data: (4HTC-20K)

Dimensions and Connections



Technical Data

Technical Data	
Displacement (1450 RPM 50Hz)	12,0 m3/h
Displacement (1750 RPM 60Hz)	14,5 m3/h
No. of cylinder x bore x stroke	4 x 41mm x 26mm
Weight	165 kg
Max. pressure (LP/HP)	100/160 bar
Connection suction line	28 mm - 1 1/8"
Connection discharge line	18 mm - 3/4"
Oil type R744 (CO2)	BSE85K (Standard), p0>40bar, pc>120bar: BSG68K (Option)
Motor data	
Motor version	1
Motor voltage (more on request)	380-420V PW-3-50Hz
Max operating current	39.2 A
Winding ratio	50/50
Starting current (Rotor locked)	97.0 A Y / 158.0 A YY
Max. Power input	23,1 kW
Extent of delivery (Standard)	
Motor protection	SE-B3(Standard), SE-B2(Option)
Enclosure class	IP65
Vibration dampers	Standard
Oil charge	2,60 dm³
Crankcase heater	0..140 W PTC (Standard)
Available Options	
Connection suction line	Option
Discharge shut-off valve	Option
Oil level monitoring	OLC-K1 (Option)
Sound measurement	
Sound power level (-10°C / 90bar)	83 dB(A) @ 50Hz
Sound pressure level @ 1m (-10°C / 90bar)	75 dB(A) @ 50Hz

Semi-hermetic Reciprocating Compressors

Motor 1 = e.g. 4TES-12 with 12"HP", primary for air-conditioning (e.g. R22,R407C) and air-conditioning with R134a at high ambient temperatures.
Motor 2 = e.g. 4TES-9 with 8"HP", universal Motor for medium and low temperature application (e.g. R404A, R507A, R407A, R407F) and air-conditioning with R134a
Motor 3 = e.g. 4TES-8, for medium temperature applications and R134a

For more information concerning the application range use the "Limits" button.

Operation modes 4VES-7 to 6FE-44 and 44JE-30 to 66FE-88 with R407F/R407A/R22

CIC = liquid injection with low temperature application, suction gas cooled motor.

ASERCOM certified performance data

The Association of European Refrigeration Component Manufacturers has implemented a procedure of certifying performance data. The high standard of these certifications is assured by:

* plausibility tests of the data performed by experts.

* regular measurements at independent institutes.

These high efforts result in the fact that only a limited number of compressors can be submitted. Due to this not all BITZER compresors are certified until now. Performance data of compressors which fulfil the strict requirements may carry the label "ASERCOM certified". In this software you will find the label at the respective compressors on the right side below the field "result" or in the print out of the performance data. All certified compressors and further information are listed on the homepage of ASERCOM.

Condensing capacity

The condensing capacity can be calculated with or without heat rejection. This option can be set in the menu Program ☐ Options. The heat rejection is constantly 5 % of the power consumption. The condensing capacity is to be found in the line Condensing cap. (with HR) resp. Condensing capacity.

Data for sound emission

Data based on 50 HZ apllication (IP-units 60 Hz) and R404A if not declared.
Sound pressure level: values based on free field area conditions with hemisperhical sound emission in 1 meter distance.

General remarks regarding sound data

Listed sound data were measured under testing conditions in our laboratory. For this purpose the free-standing test sample is mounted on a solid foundation plate and the pipework is connected vibration-free to the largest extend possible. Suction and discharge lines are fixed in a flexible configuration, such that a transmission of vibrations to the environment can be largely excluded. In real installations considerable differences might be observed, compared to the measurements in the laboratory. The airborne sound emitted by the compressor can be reflected from surfaces of the system and this may increase the airborne sound level measured close to the compressor. Vibrations caused by the compressor are also transferred to the system by the compressor feet and piping depending on the damping ratio of the fixings. Thus, the vibrations can induce other components to such an extent that these components contribute to an increase in airborne sound emission. If required, the transfer of vibrations to the system can be minimized by suitable fixing and damping elements.

Legend of connection positions according to "Dimensions":

1 High pressure connection (HP)
2 Connection for discharge gas temperature sensor (HP) (for 4VE(S)-6Y .. 4NE(S)-20(Y) connection for CIC sensor as alternative)
3 Low pressure connection (LP)
4 CIC system: injection nozzle (LP)
4b Connection for CIC sensor
4c Connection for CIC sensor (MP / operation with liquid subcooler)
5 Oil fill plug
6 Oil drain
7 Oil filter (magnetic screw)
8 Oil return (oil separator)
8* Oil return with NH3 and insoluble oil
9 Connection for oil and gas equalization (parallel operation)
9a Connection for gas equalization (parallel operation)

9b Connection for oil equalization (parallel operation)
10 Oil heater connection
11 Oil pressure connection +
12 Oil pressure connection –
13 Cooling water connection
14 Intermediate pressure connection (MP)
15 Liquid injection (operation without liquid subcooler and with thermostatic expansion valve)
16 Connection for oil monitoring (opto-electrical oil monitoring "OLC-K1" or differential oil pressure switch "Delta-PII")
17 Refrigerant inlet at liquid subcooler
18 Referigerant outlet at liquid subcooler
19 Clamp space
20 Terminal plate
21 Maintenance connection for oil valve
22 Pressure relief valve to the atmosphere (discharge side)
23 Pressure relief valve to the atmosphere (suction side)
24 IQ MODULE
SL Suction gas line
DL Discharge gas line
Dimensions can show tolerances according to EN ISO 13920-B.