

BITZER Output data

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Project survey

Semi-hermetic Reciprocating Compressors	1x	6FE-44Y
Chosen accessory		
Horizontal receivers IQ MODULE	1x	CM-RC-01



Selection: Semi-hermetic Reciprocating Compressors

Input Values

Compressor mod Mode	lel	6FE-44Y Refrigeration and Air conditioning	Suction gas tempo Operating mode	20,00 °C Auto	
Refrigerant		R449A	Power supply		400V-3-50Hz
Reference temperature		Dew point temp.	Capacity control		100%
Liq. subc. (in condenser)		0 K	Useful superheat		100%
Result					
Q [W]	Cooling capacity		COP [-]	COP/EER	
Qu* [W]	Evaporator capacity		m [kg/h]	Mass flow	
P [kŴ]	Power input		Op.	Operating mode	
1 [Å]	Current		th [°C]	Discharge gas temp	. w/o cooling
Qc [W]	Condenser capacity			5 5 1	5

tc	to	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C
30°C	Q [W]			140099	115646	94617	76593	61214	48163
	Qu* [W]			140099	115646	94617	76593	61214	48163
	P [kW]			28,9	27,7	26,2	24,3	22,2	19,89
	I [A]			53,5	51,9	49,9	47,5	44,8	42,0
	Qc [W]			168965	143373	120792	100887	83384	68053
	COP [-]			4,85	4,17	3,61	3,15	2,76	2,42
	m [kg/h]			2803	2293	1862	1498	1190	932
	Op.			Standard	Standard	Standard	Standard	Standard	Standard
	th [°C]			69,7	77,4	85,5	94,0	103,2	113,3
40°C	Q [W]			122861	101344	82783	66827	53166	41532
	Qu* [W]			122861	101344	82783	66827	53166	41532
	P [kW]			34,2	32,2	29,8	27,2	24,4	21,5
	I [A]			60,7	57,9	54,7	51,2	47,6	43,9
	Qc [W]			157075	133528	112595	94010	77553	63041
	COP [-]			3,59	3,15	2,78	2,46	2,18	1,93
	m [kg/h]			2701	2206	1787	1432	1133	881
	Op.			Standard	Standard	Standard	Standard	Standard	Standard
	th [°C]			82,4	90,2	98,4	107,1	116,5	126,9
50°C	Q [W]			105103	86615	70599	56768	44869	34675
	Qu* [W]			105103	86615	70599	56768	44869	34675
	P [kW]			38,8	36,0	32,9	29,6	26,2	22,8
	I [A]			67,1	63,1	58,8	54,4	49,9	45,6
	Qc [W]			143891	122580	103461	86341	71059	57481
	COP [-]			2,71	2,41	2,15	1,92	1,71	1,52
	m [kg/h]			2583	2105	1700	1356	1065	818
	Op.			Standard	Standard	Standard	Standard	Standard	Standard
	th [°C]			95,2	103,1	111,5	120,5	130,4	0

-- No calculation possible (see message in single point selection) *According to EN12900 (20°C suction gas temp., 0K liquid subcooling)

Application Limits 100% 6FE-44





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Technical Data: 6FE-44Y

Dimensions and Connections



Technical Data

l'echnical Data	
Displacement (1450 RPM 50Hz)	151,6 m³/h
Displacement (1750 RPM 60Hz)	183,0 m³/h
No. of cylinder x bore x stroke	6 x 82 mm x 55 mm
Weight	239 kg
Max. pressure (LP/HP)	19 / 32 bar
Connection suction line	54 mm - 2 1/8"
Connection discharge line	42 mm - 1 5/8"
Oil type R134a/R407C/R404A/R507A/R407A/R407F	BSE32(Standard) R134a tc>70°C: BSE55 (Option)
Oil type R22 (R12/R502)	B5.2(Option)
Oil type R1234yf/R1234ze	BSE32 (Standard) R1234ze tc>70°C & to>0°C: BSE55
	(Option) R1234ze to>15°C: BSE85K (Option)
Motor data	
Motor version	2
Motor voltage (more on request)	380-420V PW-3-50Hz
Max operating current	83.2 A
Winding ratio	50/50
Starting current (Rotor locked)	219.0 A Y / 362.0 A YY
Max. Power input	46,0 kW
Extent of delivery (Standard)	
Motor protection	SE-B2, CM-RC-01(Option)
Enclosure class	IP54 (Standard), IP66 (Option)
Vibration dampers	Standard
Oil charge	4,75 dm³
Discharge shut-off valve	Standard
Suction shut-off valve	Standard
Available Options	
Discharge gas temperature sensor	Option
Start unloading	Option
Capacity control	100-66-33% (Option)
Capacity Control - infinite	100-10% (Option)
Additional fan	Option
Refrigerant Injection (RI)	Option
Oil service valve	Option
Crankcase heater	140 W (Option)
Oil pressure monitoring	MP54 (Option), Delta-PII
Sound measurement	
Sound power level (-10°C / 45°C)	82,8 dB(A) @50Hz
Sound power level (-35°C / 40°C)	90,5 dB(A) @50Hz
Sound pressure level @ 1m (-10°C / 45°C)	74,8 dB(A) @50Hz
Sound pressure level @ 1m (-35°C / 40°C)	82,5 dB(A) @50Hz
Sound power level (-10°C / 45°C) R134a	80,8 dB(A) @50Hz
Sound pressure level @ 1m (-10°C / 45°C) R134a	72,8 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 application (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")



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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.



Selection: Horizontal receivers

Input Values

Common Yes Auto Operating point Auto

Operating Points

	Α
to [°C]	-10
tc [°C]	32

Result



Selection of the receivers:

1) "Approx. according to cooling capacity":

The receiver volume is determined by the design of the unit, the operating mode and the function of the receiver (receiving the complete refrigerant charge in the receiver or only compensating capacity variations). When selected via cooling capacity, an approximate selection of the receiver is obtained. Receivers in systems with long pipelines, winter control or in very compact systems should be selected according to method 2).

2) "According to refrigerant charge in the receiver":

The calculation is made on the basis of the specified refrigerant charge. The receiver volume is determined at 20°C and at a maximum filling charge of 95% of the possible receiver content.

Compressor units equipped with receiver

The BITZER range of products comprises compressor units with horizontal receivers. In the output window of the accessories these units, which are included in the standard delivery, are marked with "mounted" in the compressor unit line. Units that can be mounted, but are not included in the Bitzer delivery program, are marked with "single parts". Units in which the compressor does not fit onto the receiver are marked with "---".



Selection: IQ MODULE

Result

QuantitSelection		Extent of Delivery	Functionality	
1	CM-RC-01 Basis Package for 4JE-13 6FE-50	CM-RC-01 mounted in the extension terminal box with all actuators and sensors wired	Data logging of operating conditions, compressor start function (contactors), Modbus communication, Bluetooth	
		Motor temperature sensor (PTC)	Motor overheat protection	
		Discharge gas temperature sensor (PT1000)	Compressor discharge temperature protection and recording	
		Oil pressure sensor (DP-1)	Oil pressure monitoring and recording	
		Crankcase heater	Automated oil heater control	
1	VARISTEP valve for 4JE-13 6FE-50	VARISTEP solenoid valve with coil mounted and wired	Automated and quasi stepless capacity adaptation between 50 and 100% (010V Input). 2 x VARISTEP: 3366100%. See also KT-101.	
1	SU valve for 4JE-13 6FE-50	SU solenoid valve with coil mounted and wired	Unloading of the compressor for reduced starting current and torque	



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Technical Data: CM-RC-01

Dimensions and Connections











6JE .. 6FE CRII(2) / SU





Technical Data

489

Electrical data

Operating Voltage Required fuse Enclosure class for module housing of 4VES-6 .. 6FE-50 Enclosure class for module housing of 8GE-50 .. 8FE-70 Allowable ambient temperature Maximum allowable altitude Allowable relative humidity Extent of delivery (Standard) Interfaces:

115V-230V +10%/-15% 8A @ 115V / 4A @ 230V IP65 IP54 -30°C / 70°C 2000m 5%-95%

- Modbus RTU

- Bluetooth

Real-time clock



Legend of connection positions according to "Dimensions": 1 Discharge gas temperature sensor

2 Crankcase heater 3 Oil level sensor (DLC-D1) / Oil pressure sensor (DP-1) A Terminal box cover B Compressor module housing

C LED sight glass D Compressor terminal box