BITZER Output data

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Project survey

Selected compressors

Semi-hermetic Reciprocating Compressors	1x	6HE-35Y

Chosen accessory

Horizontal receivers IQ MODULE	1x	CM-RC-01

Selection: Semi-hermetic Reciprocating Compressors

Input Values

Compressor model	6HE-35Y	Suction gas temperature	20,00 °C
Mode	Refrigeration and Air conditioning	Operating mode	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%

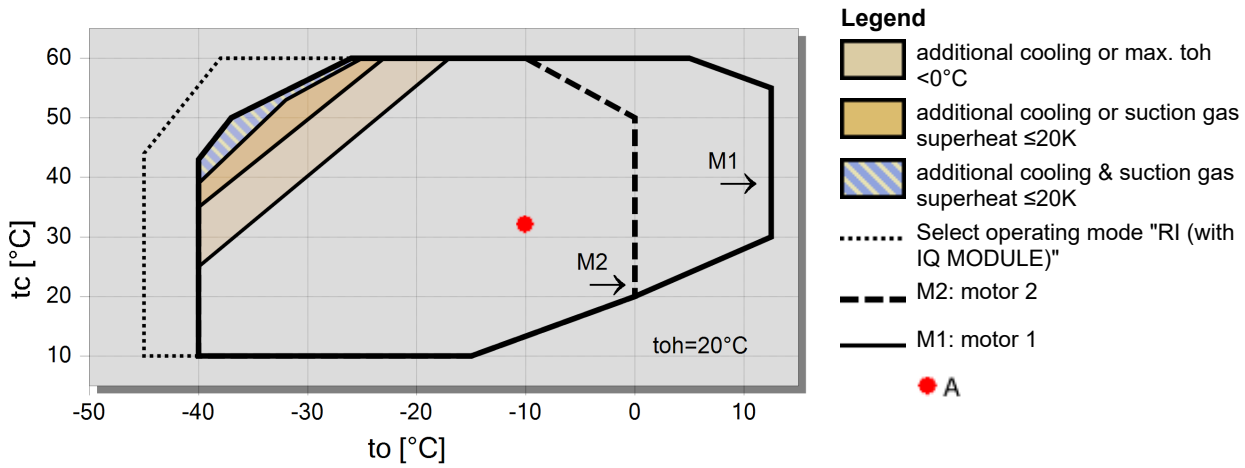
Result

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

tc	to	10°C	5°C	0°C	-5°C	-10°C	-15°C	-20°C	-25°C
30°C	Q [W]	144510	120550	99909	82134	66862	53785	42642	33202
	Qu* [W]	144510	120550	99909	82134	66862	53785	42642	33202
	P [kW]	20,9	20,8	20,3	19,51	18,39	17,03	15,50	13,85
	I [A]	38,8	38,7	38,1	36,9	35,5	33,7	31,8	29,9
	Qc [W]	165388	141362	120246	101645	85251	70819	58143	47051
	COP [-]	6,92	5,79	4,91	4,21	3,64	3,16	2,75	2,40
	m [kg/h]	2961	2438	1999	1629	1316	1052	829	643
	Op.	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	th [°C]	54,9	62,0	69,3	77,0	85,2	94,0	103,5	114,0
40°C	Q [W]	127044	105757	87385	71548	57933	46278	36354	27959
	Qu* [W]	127044	105757	87385	71548	57933	46278	36354	27959
	P [kW]	26,0	25,2	24,0	22,5	20,8	18,95	16,93	14,84
	I [A]	46,1	44,9	43,2	41,2	38,8	36,2	33,6	31,0
	Qc [W]	152995	130917	111392	94097	78777	65230	53284	42798
	COP [-]	4,90	4,20	3,64	3,17	2,78	2,44	2,15	1,88
	m [kg/h]	2867	2353	1921	1558	1251	992	775	593
	Op.	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	th [°C]	67,0	74,3	81,9	89,9	98,4	107,5	117,6	128,9
50°C	Q [W]	109243	90688	74638	60782	48865	38666	29992	22671
	Qu* [W]	109243	90688	74638	60782	48865	38666	29992	22671
	P [kW]	30,3	28,8	27,1	25,1	22,8	20,5	18,01	15,53
	I [A]	52,5	50,4	47,7	44,8	41,6	38,3	35,0	31,8
	Qc [W]	139528	119537	101727	85849	71706	59137	48007	38205
	COP [-]	3,61	3,14	2,76	2,42	2,14	1,89	1,66	1,46
	m [kg/h]	2764	2258	1834	1477	1176	924	712	535
	Op.	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
	th [°C]	79,1	86,6	94,4	102,8	111,8	121,6	132,6	0

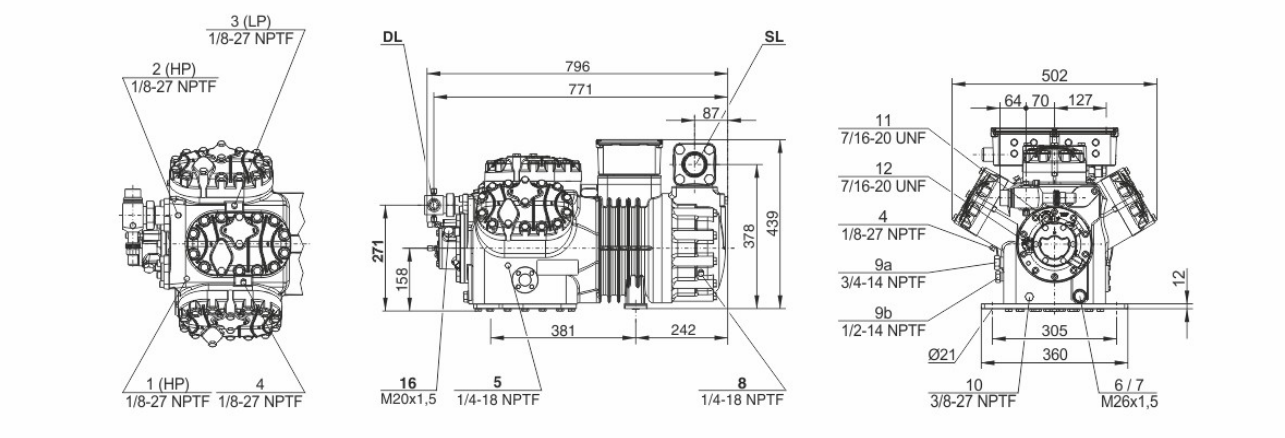
-- No calculation possible (see message in single point selection)
*According to EN12900 (20°C suction gas temp., 0K liquid subcooling)

Application Limits 100% 6HE-35



Technical Data: 6HE-35Y

Dimensions and Connections



Technical Data

Technical Data	
Displacement (1450 RPM 50Hz)	110,5 m³/h
Displacement (1750 RPM 60Hz)	133,4 m³/h
No. of cylinder x bore x stroke	6 x 70 mm x 55 mm
Weight	235 kg
Max. pressure (LP/HP)	19 / 32 bar
Connection suction line	54 mm - 2 1/8"
Connection discharge line	35 mm - 1 3/8"
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	1
Motor voltage (more on request)	380-420V PW-3-50Hz
Max operating current	64.4 A
Winding ratio	50/50
Starting current (Rotor locked)	165.0 A Y / 275.0 A YY
Max. Power input	36,0 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
Oil service valve	Option
Crankcase heater	140 W (Option)
Oil pressure monitoring	MP54 (Option), Delta-PII
Sound measurement	
Sound power level (+5°C / 50°C)	81,4 dB(A) @50Hz
Sound power level (-10°C / 45°C)	81,8 dB(A) @50Hz
Sound power level (-35°C / 40°C)	89,5 dB(A) @50Hz
Sound pressure level @ 1m (+5°C / 50°C)	73,4 dB(A) @50Hz
Sound pressure level @ 1m (-10°C / 45°C)	73,8 dB(A) @50Hz
Sound pressure level @ 1m (-35°C / 40°C)	81,5 dB(A) @50Hz
Sound power level (+5°C / 50°C) R134a	79,4 dB(A) @50Hz
Sound power level (-10°C / 45°C) R134a	79,8 dB(A) @50Hz
Sound pressure level @ 1m (+5°C / 50°C) R134a	71,4 dB(A) @50Hz
Sound pressure level @ 1m (-10°C / 45°C) R134a	71,8 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 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.

Selection: Horizontal receivers

Input Values

Common	Yes
Auto	
Operating point	Auto

Operating Points

	A
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

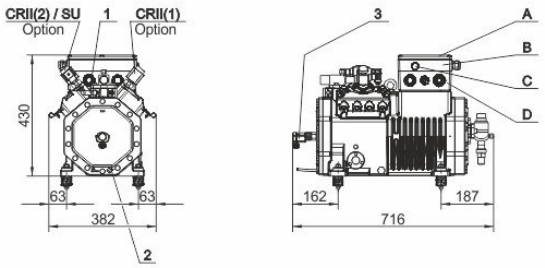
Result

Quantity	Selection	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% (0..10V Input). 2 x VARISTEP: 33..66..100%. 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

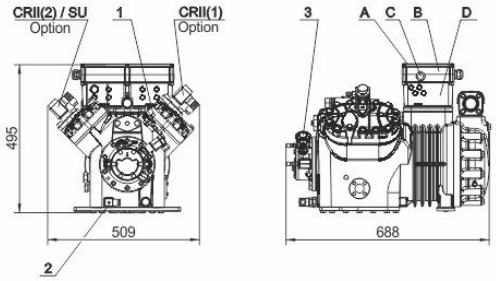
Technical Data: CM-RC-01

Dimensions and Connections

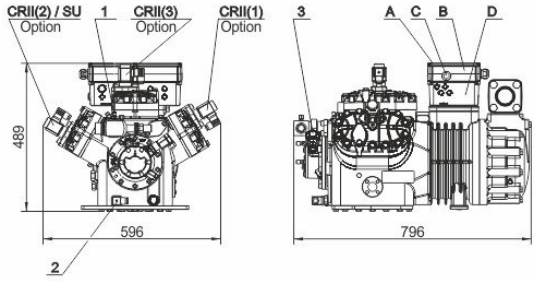
4VES .. 4NES



4JE .. 4FE



6JE .. 6FE



Technical Data

Electrical data	
Operating Voltage	115V-230V +10%/-15%
Required fuse	8A @ 115V / 4A @ 230V
Enclosure class for module housing of 4VES-6 .. 6FE-50	IP65
Enclosure class for module housing of 8GE-50 .. 8FE-70	IP54
Allowable ambient temperature	-30°C / 70°C
Maximum allowable altitude	2000m
Allowable relative humidity	5%-95%
Extent of delivery (Standard)	
Interfaces:	
- 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 (OLC-D1) / Oil pressure sensor (DP-1)
A Terminal box cover
B Compressor module housing
C LED sight glass
D Compressor terminal box