



BITZER Output data

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Project survey

Selected compressors

Semi-hermetic Reciprocating Compressors	1x	4FES-3Y
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Chosen accessory

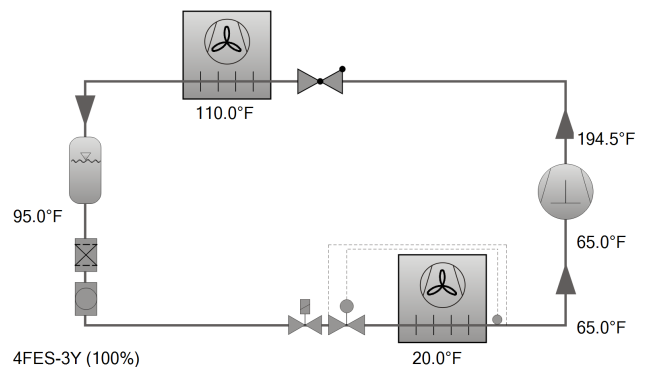
Horizontal receivers	1x	F152H
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Selection: Semi-hermetic Reciprocating Compressors

Input Values

Compressor model	4FES-3Y
Mode	Refrigeration and Air conditioning
Refrigerant	R134a
Reference temperature	Dew point temp.
Evaporating SST	20.00 °F
Condensing SDT	110.0 °F
Liq. subc. (in condenser)	15.00 °F
Suction gas temperature	65.0 °F
Operating mode	Auto
Power supply	460V-3-60Hz UL
Capacity control	100%
Useful superheat	100%



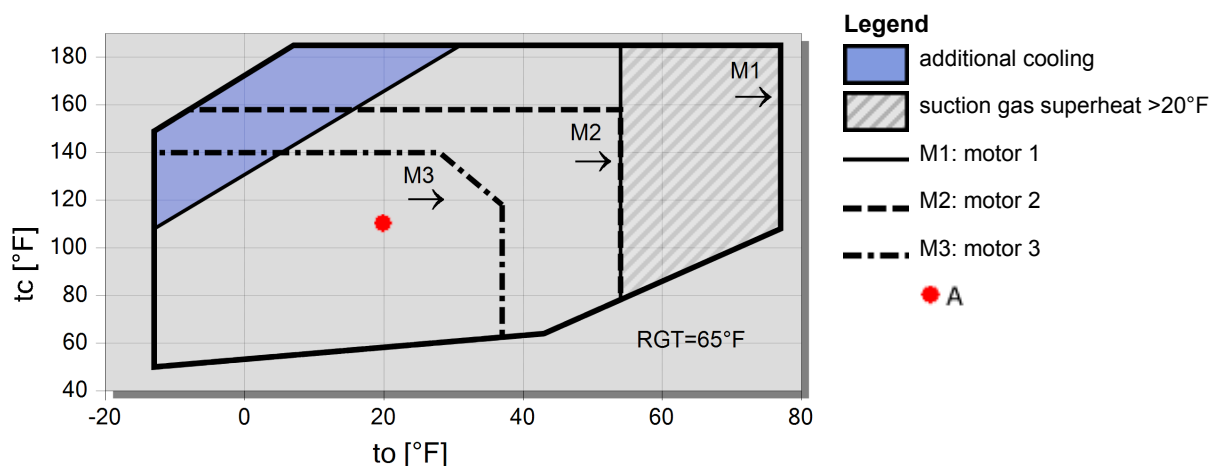
Result

Compressor	4FES-3Y-4SU
Capacity steps	100%
Cooling capacity	27.4 kBtu/h
Cooling capacity *	25.4 kBtu/h
Evaporator capacity	27.4 kBtu/h
Power input	2.75 kW
Current (460V)	5.03 A
Voltage range	440-480V
Condenser capacity	36.8 kBtu/h
COP/EER	9.99
COP/EER *	9.24
Mass flow	382 lb/h
Operating mode	Standard
Discharge gas temp. w/o cooling	194.5 °F

Tentative Data.

*with 65°F suction gas temperature, 0°F liquid subcooling

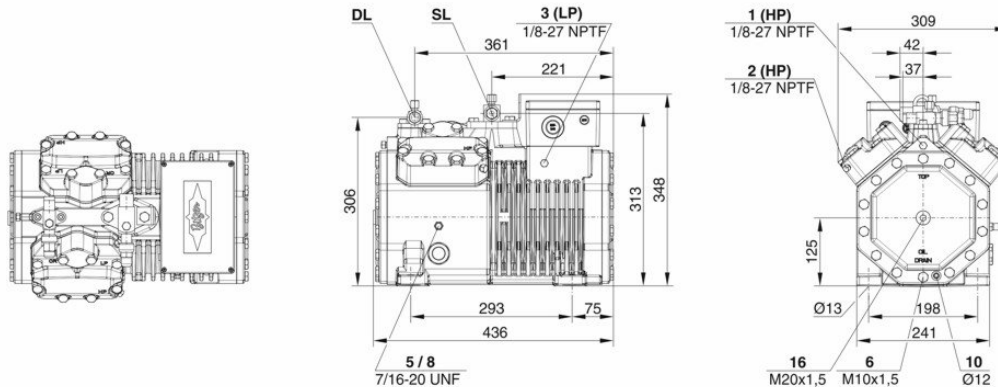
Application Limits 100% 4FES-3





Technical Data: 4FES-3Y

Dimensions and Connections



Technical Data

Technical Data

Displacement (1450 RPM 50Hz)	637.4 CFH
Displacement (1750 RPM 60Hz)	769.2 CFH
No. of cylinder x bore x stroke	4 x 1.61 inch x 1.55 inch
Weight	181 lb
Max. pressure (LP/HP)	275 / 464 psi
Connection suction line	22 mm - 7/8"
Connection discharge line	16 mm - 5/8"
Oil type R134a/R407C/R404A/R507A/R407A/R407F	BSE32(Standard) R134a tc>155°F: 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)	440-480V Y-3-60Hz UL
Max operating current	9.5 A
Starting current (Rotor locked)	47.5 A
Max. Power input	6.4 kW

Extent of delivery (Standard)

Motor protection	SE-B1
Enclosure class	IP66
Vibration dampers	Standard
Oil charge	70.4 fl oz

Available Options

Discharge gas temperature sensor	Option
Capacity control	100-50% (Option)
Capacity Control - infinite	100-10% (Option)
Additional fan	Option
Crankcase heater	0..120 W PTC (Option)
Oil level monitoring	OLC-K1 (Option)

Sound measurement

Sound power level (-10°C / 45°C)	71,1 dB(A) @ 60Hz
Sound power level (-35°C / 40°C)	73,0 dB(A) @ 60Hz
Sound pressure level @ 1m (-10°C / 45°C)	63,1 dB(A) @ 60Hz
Sound pressure level @ 1m (-35°C / 40°C)	65 dB(A) @ 60Hz



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 compressors 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 hemispherical 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 extent 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-P11")



- 17 Refrigerant inlet at liquid subcooler
 - 18 Refrigerant 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 [°F]	20
tc [°F]	110

Result

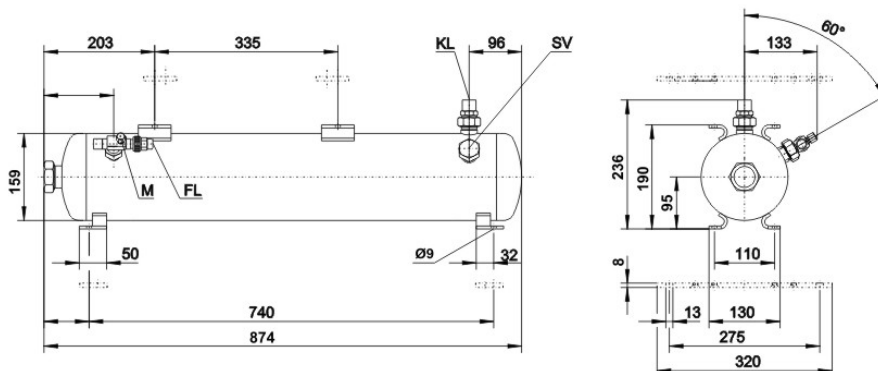
Compressor:	4FES-3Y
Recommendation:	F152H
Selection	F152H
Recommended operating point:	A
Selected operating point:	A
Receiver volume	528 fl.oz.
max refrigerant charge	36.6 lb
receiver load	86.7 %
Receiver unit	mounted compl.
lower fixing rails	327301-04
upper fixing rails	327301-22
upper fixing plate	320366-02

#1: Receiver selection for compact systems without condensing pressure control. Precise calculation only via refrigerant charge (see notes).



Technical Data: F152H

Dimensions and Connections



Technical Data

Technical Data

Weight	34.2 lb
Total width	34.4 "
Total depth	8.4 "
Total height	9.3 "
Receiver volume refrigerant	527.93 fl.oz
Max. refrigerant charge 90% at 20°C / 68°F	
R22	36.0 lb
R134a	36.5 lb
R407C	34.5 lb
R404A/R507A	31.8 lb
R448A	33,1 lb
R449A	33,2 lb
R450A	35,5 lb
R513A	36,4 lb
R1234yf	33 lb
R1234ze	35 lb
Max. pressure	475 psi
Max. Operating Temperature	248°F
Connection inlet KL	22mm - 7/8"
Connection thread/ -flange	1 1/4" - 12 UNF
Connection outlet FL	16mm - 5/8"
Connection thread/ -flange	1" - 14 UNS
Gauge	7/16" 20UNF
Connection for pressure relief valve	1 1/4"-12UNF
Adapter for pressure relief valve	Option
Minimum level control	Option
Maximum level control	Option
*According PED 2014/68/EU	Standard
Special Approvals (on request)	Option



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 "--".