



DAS HERZ DER FRISCHE

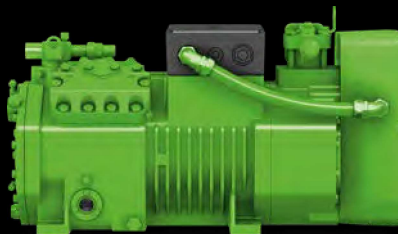
SEMI-HERMETIC

# RECIPROCATING COMPRESSORS

50 Hz // KP-100-1 EN



ECOLINE



VARISPEED



ECOLINE Tandem



WITH IQ MODULE

 INTELLIGENT PRODUCTS

 HFO READY

 PROPANE



## BITZER Innovation Targets

### Products for refrigerants with low global warming potential (GWP)

- // For naturally appearing substances
- // For new refrigerants like R1234yf, R1234ze(E) and low-GWP blends

These refrigerants reduce the direct contribution of refrigeration systems to global warming.

### Products with high efficiency at full and part load

- // Efficiency improvements of motor and mechanics
- // High system efficiency in part load operation
  - by optimised mechanical capacity regulation
  - by specially developed frequency inverters

This reduces the indirect contribution to global warming by saving energy.

### Simple handling and serviceability with advanced electronic modules

- // Electronic components for
  - data logging
  - capacity regulation
  - actuation of accessories
- // Unified user software for simple configuration. Choose compressor or condensing unit and refrigerant. Ready.

This makes it simple to fully utilize the efficiency potential of our products and optimise operation.

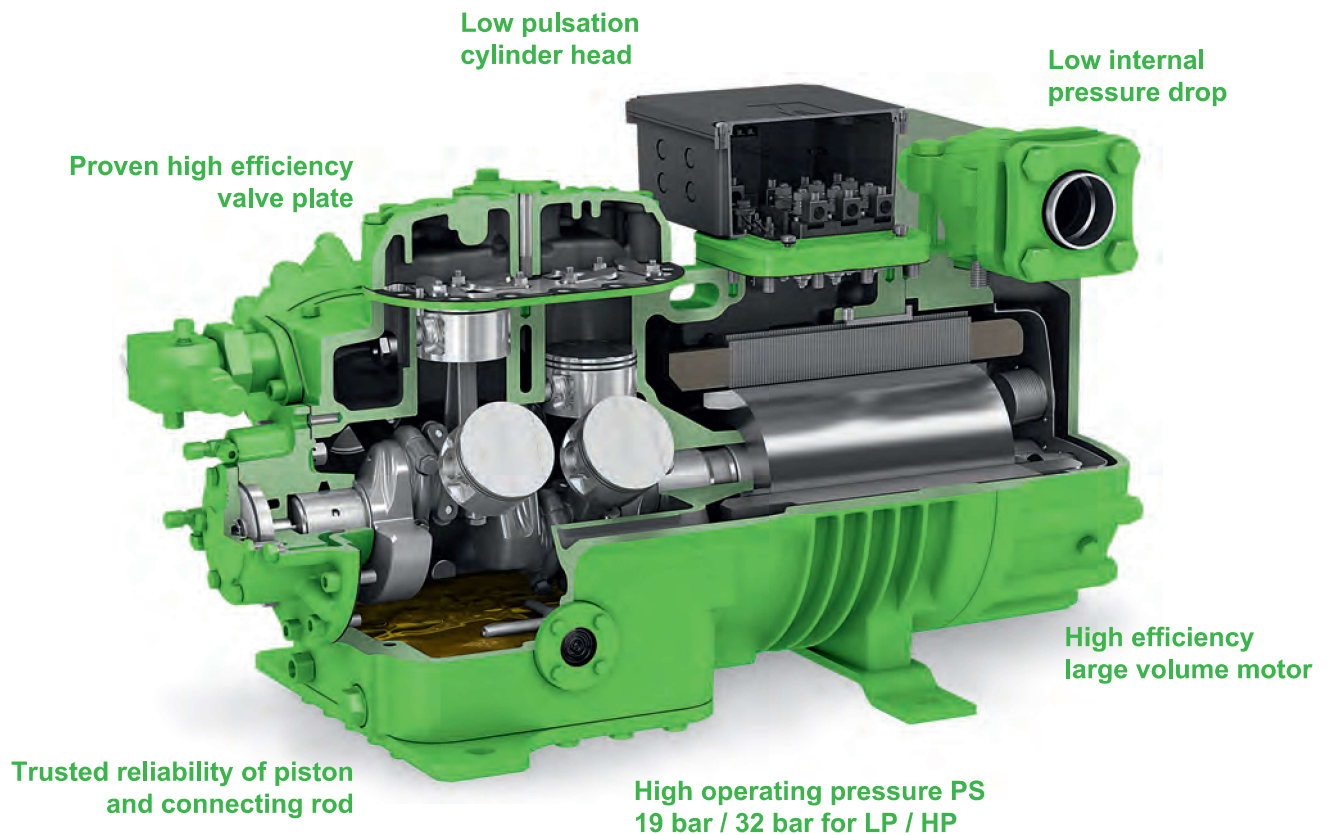
## Semi-hermetic Reciprocating Compressors

### Series: ECOLINE // ECOLINE Tandem // OCTAGON // VARISPEED

Content	Page
<b>ECOLINE</b>	3
<b>Refrigerants with low global warming potential</b>	4
<b>Diversity of refrigerants</b>	4
<b>Compressor efficiency</b>	5
<b>The ECOLINE capacity range</b>	6
<b>ECOLINE single compressors</b>	7
<b>ECOLINE tandems</b>	8
<b>VARISPEED</b>	8
<b>Special designs</b>	9
ECOLINE for A3 refrigerants	9
OCTAGON for R410A and R32	10
ECOLINE with single phase motors	10
ECOLINE for explosion-proof areas	11
ECOLINE H	12
<b>ECOLINE are easy to handle</b>	13
Backwards compatible	13
Simple pair compounding	13
Retrofittable accessories	13
Suitable for retrofitting	13
Wide application range	13
<b>The accessories: flexible modular system</b>	14
ECOLINE with external FI	14
VARIPACK	15
IQ MODULE	16
VARISTEP	17
OLM-IQ	18
BEST SOFTWARE and BEST APP	18
The accessories at a glance	19
<b>BITZER SOFTWARE</b>	21
<b>Selected application limits</b>	22
<b>Technical Data</b>	24
<b>Dimensional drawings</b>	29



## The BITZER semi-hermetic reciprocating compressors



### ECOLINE

Semi-hermetic reciprocating compressors for applications in commercial refrigeration with low, medium and high evaporation temperatures, in heat pumps and special applications: depending on the combination of motor and refrigerant.

A successful synthesis of well balanced drive gear mechanics, motors with high efficiency over a broad range, as well as optimised gas flow in the suction and compression process.

Together with minimum flow losses and reduced heat transmission from the hot gas to the suction gas side this results in the unique operating characteristics.

### The cylinder head system

Smooth operation of the optimised working valves including the newly developed geometric concept of the discharge valves for minimal reexpansion in conjunction with the flow channels and coupled volumes.

### The designs

- // ECOLINE single compressor
- // ECOLINE tandem
- // ECOLINE VARISPEED
- // Special designs
  - for specific refrigerants
  - with single phase motor
  - for explosion-proof areas
  - for transport applications
  - for high temperature heat pumps

- REFRIGERATION
- PROCESS COOLING
- AIR CONDITIONING
- HEAT PUMPS

## Refrigerants with low global warming potential

All ECOLINE compressors can be used with new refrigerants of low global warming potential (GWP). These refrigerants are important tools to reach the emission reductions of the EU Regulation 517/2014 and similar scenarios enacted worldwide. Their application is in line with our innovation targets.

The hydrofluoroolefins (HFO, unsaturated fluorinated hydrocarbons) R1234yf and R1234ze(E), two variants of tetrafluoropropene, play a central role. They can be used as pure substance or as components of blends. The pure substances R1234yf and R1234ze(E) are flammable in safety class A2L according to ISO817.

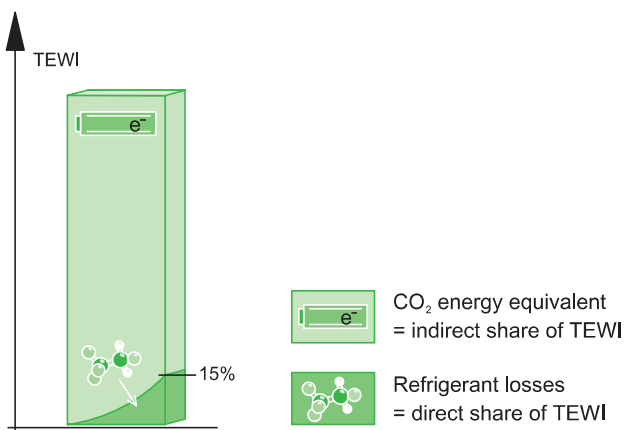
For the environmentally friendly refrigerant R290 propane, special compressor types are available. For flammable refrigerants, a risk assessment for the system must take flammability into account. The system must be constructed in accordance with national or local regulations. If the risk assessment classifies the installation area as an explosion protection zone, the standard compressors cannot be used. For installation in ATEX zones 1 and 2, special explosion-proof compressor versions have been designed. Consultation with BITZER is absolutely necessary.

### Environmental impact (TEWI)

The environmental impact of a refrigeration system can, amongst others, be represented by the Total Equivalent Warming Impact (TEWI).

Typical TEWI balances for supermarkets show that energy consumption contributes most to the total greenhouse impact. This indirect greenhouse effect – CO<sub>2</sub> emission as a result of power generation – can amount to over 90%.

The eco-balance can therefore best be improved by better efficiency.



## Diversity of refrigerants

The compressors of the ECOLINE series are suitable for operation with a large selection of current and future refrigerants.

- // R1234yf – A2L
- // R513A
- // R450A
- // R134a
- // R1234ze(E) – A2L
- // R515B
- // R245fa
- // R454C – A2L
- // R448A
- // R449A
- // R454A – A2L
- // R455A – A2L
- // R404A
- // R507A
- // R407A, R407C, R407F and R407H
- // R452A
- // R22
- // R410A
- // R32 – A2L
- // R290 – A3
- // R1270 – A3
- // R600a – A3
- // further HFO and HFO/HFC blends

R410A/R32 with individual models  
 R290/R1270/R600a with individual models  
 R245fa/R515B with individual models



### Retrofit

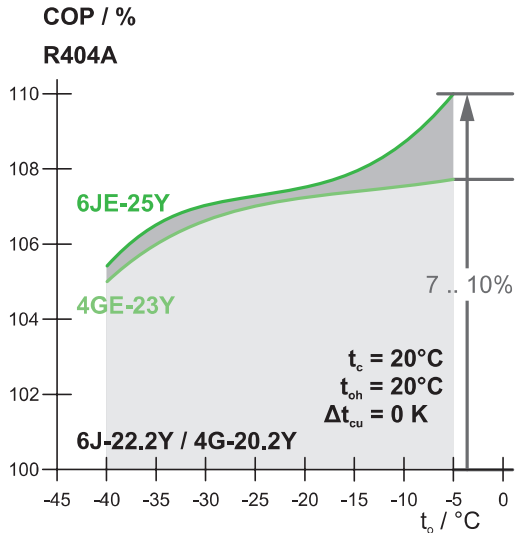
The compressors are designed for the operation with "Low-GWP" HFO refrigerants and HFO/HFC blends.

A system originally designed for R134a can be converted to R513A, at any time (A1-Drop-In). Taking into account flammability, it will be possible to also use R1234yf for certain systems later. Compressors already commissioned with R448A or R449A may be converted to R454C, for example.

## Compressor efficiency

The coefficient of performance (COP) of the ECOLINE models has been improved by an average of 6% up to a maximum of 12% compared with preceding series.

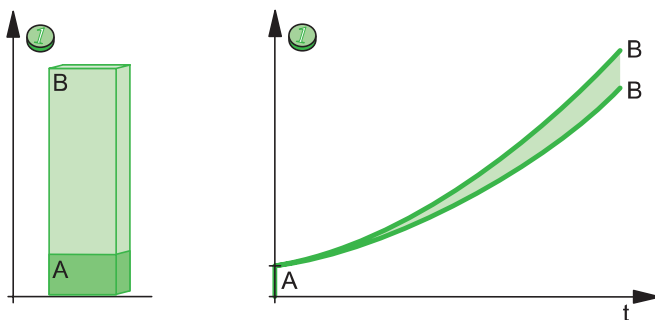
### Winter



This is not achieved with a single component, but by optimising the valve plates, reducing flow losses and discharge gas pulsation as well as specially adapted highly efficient motors with broad band characteristics.

All with BITZER's well known smooth operation and real backward compatibility.

### Life cycle costs



Life cycle costs of refrigeration system

Capital expenditure costs

Energy consumption and maintenance

Total cost of ownership (life cycle costs) of a supermarket system is to its largest part generated through the many years of operation – about 80% and more – depending on design and operating conditions.

## System efficiency

Modern refrigeration systems require compressors with flexible capacity adaptation. Via high part load efficiency these modern systems achieve excellent seasonal efficiency. BITZER offers proven capacity control systems for the entire ECOLINE series as optional accessories:

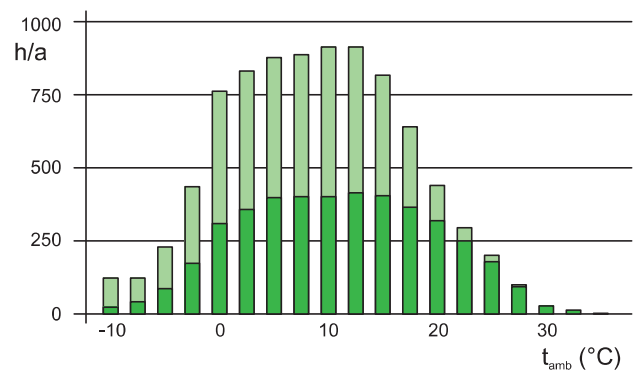
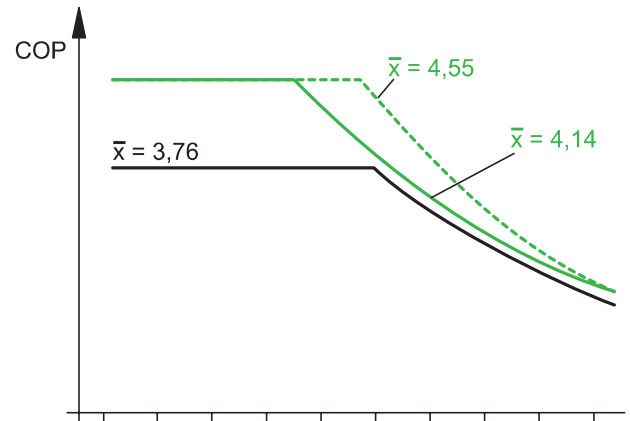
// The ECOLINE VARISTEP system: fast cycling blocked suction of one, several or all cylinder banks

// The ECOLINE VARISPEED design with integrated frequency inverter

// VARIPACK: external frequency inverters

All ECOLINE compressors are designed for operation with an external frequency inverter up to 70 Hz.

### Seasonal efficiency and temperature distribution



$\bar{x}$  Seasonal efficiency (weighted average)

ECOLINE & CR / VARISPEED,  $t_{c\ min} = 10^\circ\text{C}$

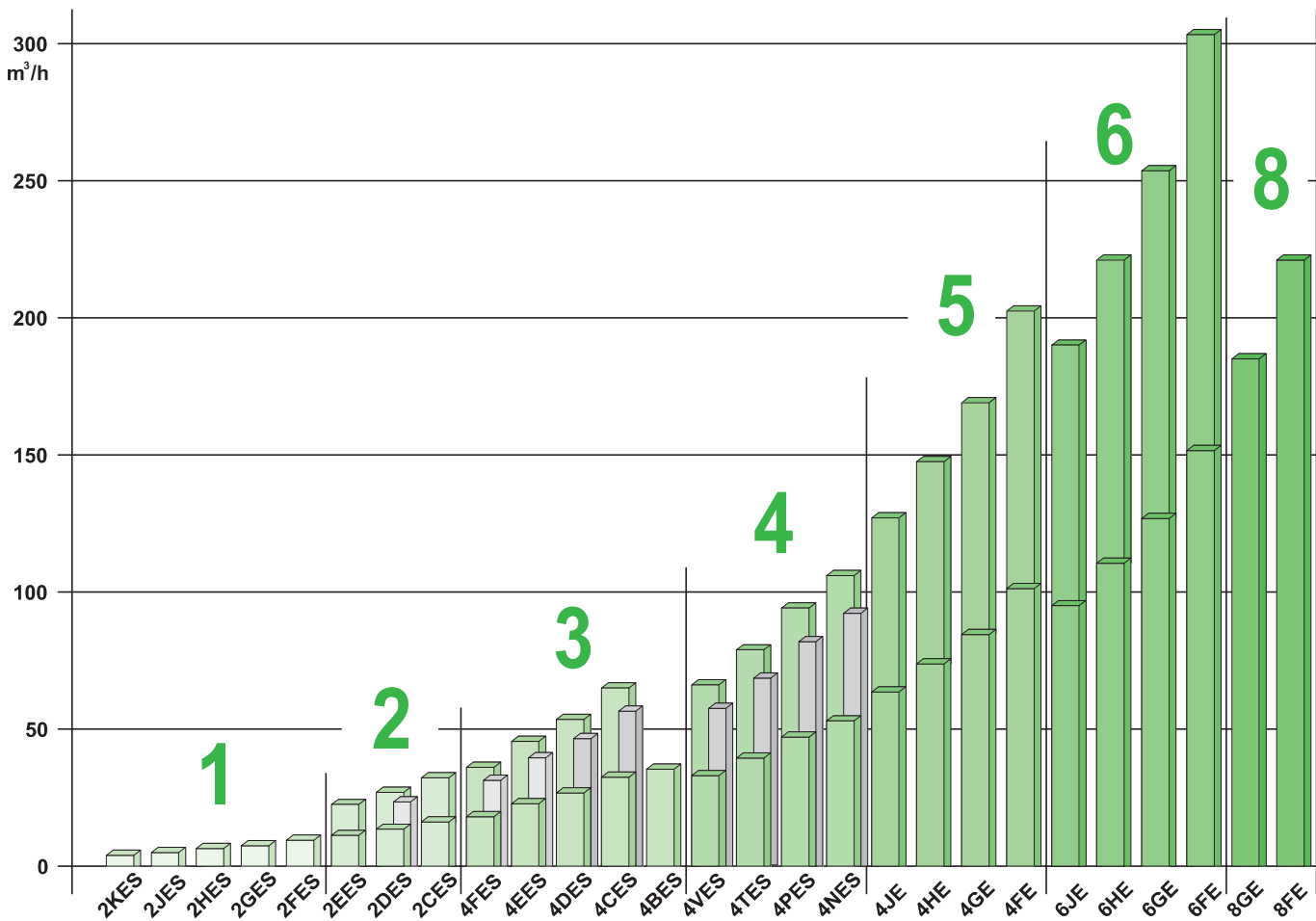
ECOLINE with  $t_{c\ min} = 10^\circ\text{C}$

Standard compressor with  $t_{c\ min} = 25^\circ\text{C}$

Operating hours at part load

Operating hours at full load

## The efficient ECOLINE capacity range



All ECOLINE at a glance: Single compressors (front) VARISPEED (grey) and tandem compressors (back)

### A finely graduated product range for modern refrigeration, A/C and heat pump systems

With the ECOLINE series BITZER offers highly efficient all-purpose compressors, which meet the challenging demands of modern refrigeration systems:

// Extended application range

// Energy efficient

high cooling capacity and minimum energy requirement:

- highly efficient working valves
- minimum clearance volume
- efficient, large-volume motor
- reduced flow losses at low condensing temperatures

// Quiet with low vibration

- optimised mass balance
- low discharge gas pulsations due to special cylinder head design

// Minimum space requirement

// Robust

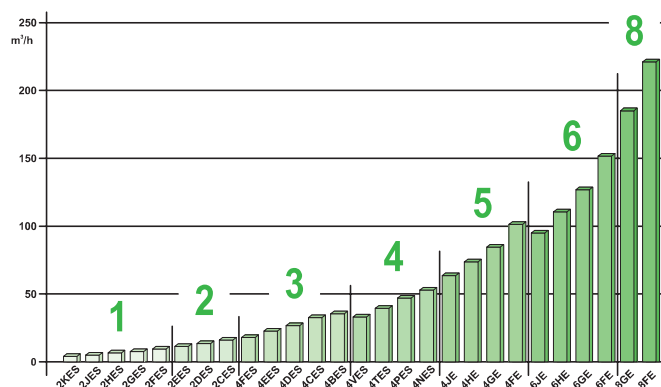
- robust valve plate design
- valves made of impact resistant spring steel
- wear resistant drive gear
- surface hardened eccentric shaft and crankshaft
- low friction bearings and aluminium pistons

// Efficient capacity control

- cylinder shut-off or variable speed capacity control possible

The ECOLINE series is design know-how cast in metal representing over 80 years of development experience by the market leader in reciprocating compressor technology. It is the consequent further development based on several generations of BITZER compressors, starting with the BHS series via the .2 generation and the OCTAGON series.

## ECOLINE single compressors



All single compressors with displacement at 50 Hz

### 2KES-05Y .. 8FE-70Y

Single compressors are the basis of the ECOLINE series. In almost all sizes they are available with two or three motors of different power, in motor version 1, 2 or 3.

The motor version 1 is the specialist for demanding pressure levels.

The motor version 2 covers the classic refrigeration applications – medium and low temperature refrigeration – with one single product.

The motor version 3 is specially designed for moderate operating pressures: for supermarket applications with R134a and refrigerants of similar pressure level and for FI operation up to 70 Hz without restrictions with mains voltage 400V/3/50Hz.

The ECOLINE single compressors are the basic component of the air cooled condensing units LH..E, ECOLITE and ECOSTAR and of the water cooled units with the K series condensers.

## Refrigerants

- // R1234yf
- // R513A
- // R450A
- // R134a
- // R1234ze(E)
- // R448A
- // R449A
- // R454A, R454C
- // R455A
- // R404A
- // R507A
- // R407A, R407C, R407F, R407H
- // R452A
- // R22

8GE-50Y .. 8FE-70Y: typically  $t_0 \geq -15^\circ\text{C}$   
 R1234ze(E) with motor 1: Use ECOLINE H design.

## Oil charge

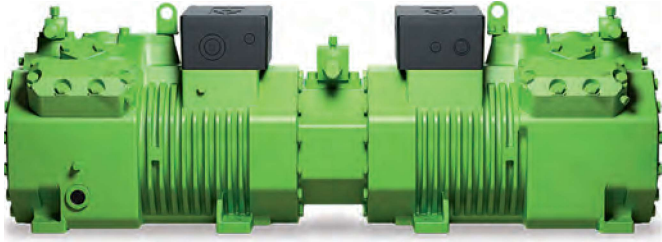
- // standard: polyolester oil BSE32
- // option: polyolester oil BSE55, required for  $t_c > 70^\circ\text{C}$  and for R1234ze(E)
- // standard for R22: mineral oil B5.2
- // standard for R1234ze(E) and motor 1: polyolester oil BSE85K

## Explanation of model designation

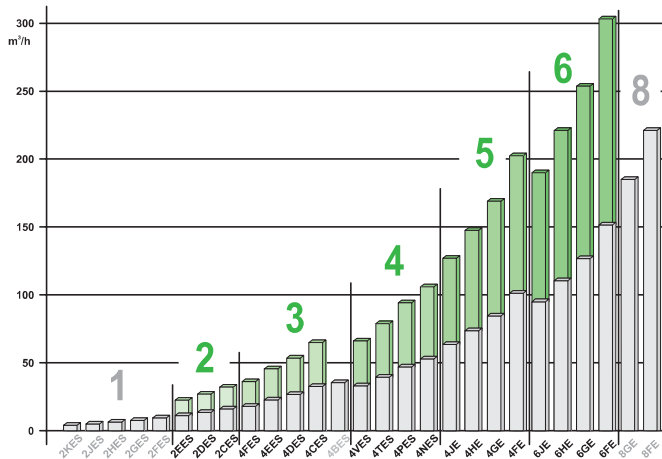
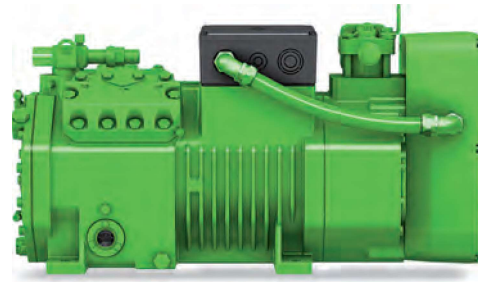
Example

<b>4</b> N E S - 20 Y - 40P	Number of cylinders double with tandem compressors
<b>4</b> N E S - 20 Y - 40P	Identification for bore x stroke
<b>4</b> N E S - 20 Y - 40P	ECOLINE series
<b>4</b> N E <b>S</b> - 20 Y - 40P	Centrifugal lubrication without identification letter: pump lubrication
<b>4</b> N E S - <b>20</b> Y - 40P	Motor size double with tandem compressors
<b>4</b> N E S - 20 <b>Y</b> - 40P	Oil charge: polyolester oil
<b>4</b> N E S - 20 Y - <b>40P</b>	Motor code

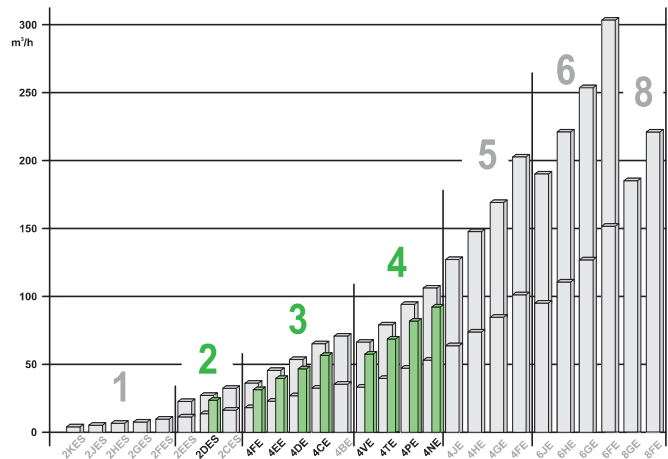
## ECOLINE tandem



## VARISPEED



Green: All tandem compressors with displacement at 50 Hz



Green: All VARISPEED compressors with displacement at 87 Hz

### 22EES-4Y .. 66FE-100Y

Tandem compressors are the simplest and safest form of parallel operation of two compressors. Refrigerants, application limits and refrigeration compressor oils correspond to the single compressors.

The two crankcases are connected via a large volume suction chamber. Oil and gas equalisation therefore works automatically.

Performance steps are easily controlled:

- // 100% or 50% via single compressor on and off.
- // Virtually stepless capacity control for 4- and 6-cylinder models, which are fitted completely with IQ VARISTEP: 100% down to about 5%.

### One Series with several FI capacities

- // 2DES-3.F1Y
- // 4FE-5.F1Y .. 4CE-6.F1Y
- // 4DE-7.F3Y .. 4CE-9.F3Y
- // 4VE-7.F3Y .. 4NE-14.F3Y
- // 4VE-10.F4Y .. 4NE-20.F4Y

Single compressors with integrated suction gas cooled frequency inverter (FI). Due to the large continuous control range, the VARISPEED compressors are suitable for systems with major load variations or as lead compressor in racks. Refrigerant and refrigeration compressor oils correspond to the single compressors.

Easy to commission due to completely parameterised FI.

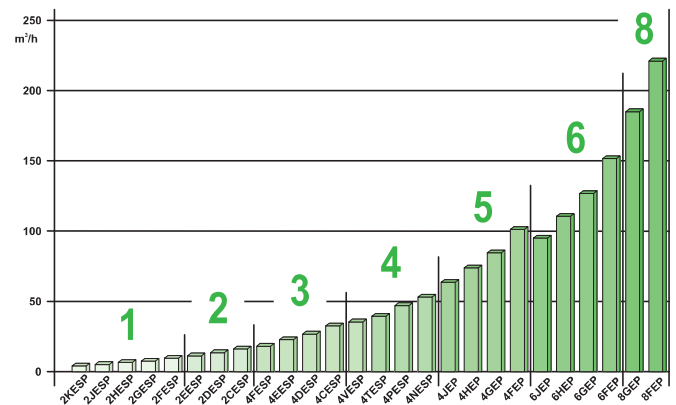
Infinite capacity control:

- // 2-cylinder models between 30 and 87 Hz
- // 4-cylinder models between 25 and 87 Hz



## Special designs

### ECOLINE for A3 refrigerants



All ECOLINE compressors for A3 refrigerants with displacement at 50 Hz

### Designs

// 2KESP-05Z .. 8FEP-70Z

// 2KESP-05P .. 8FEP-70P

The refrigerants R290 and R1270 are naturally occurring, halogen-free and have a negligible global warming potential GWP. They are flammable and assigned to safety class A3. Handling them requires specific expertise. The compressor protection device is included, it must be mounted in the switch cabinet.

### Refrigerants and application ranges

// R290: Propane for

- low temperature applications
- medium temperature applications
- air conditioning applications
- heat pumps

// R1270: Propene for

- low temperature applications
- medium temperature applications

// R600a and R600: isobutane and butane for

- heat pumps, upon request

### Ölfüllung

// oil designation Z: polyalkylene glycol oil BSG68K

// oil designation P: poly-alpha-olefin SHC226E

### VARISPEED model designation

Example

**2** D E S - 3 . F1 Y

Number of cylinders

**2** D E S - 3 . F1 Y

Identification for bore x stroke

**2** D **E** S - 3 . F1 Y

ECOLINE series

**2** D E **S** - 3 . F1 Y

Centrifugal lubrication without identification letter: pump lubrication

**2** D E S - **3** . F1 Y

Motor size

**2** D E S - 3 **F1** Y

Identification for frequency inverter

**2** D E S - 3 . F1 **Y**

Oil charge: polyolester oil

### Model designation of ECOLINE for A3 refrigerants

Example

**2** C E S **P** - 4 Z - 40S

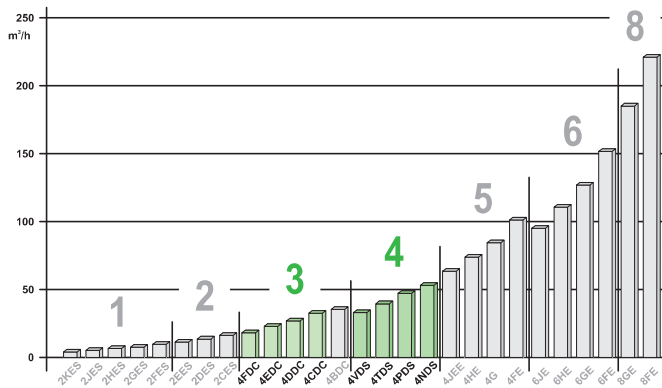
Special design for A3 refrigerants

**2** C E S **P** - 4 **Z** - 40S

Oil charge: Z = polyalkylene glycol oil  
or P = poly-alpha-olefin

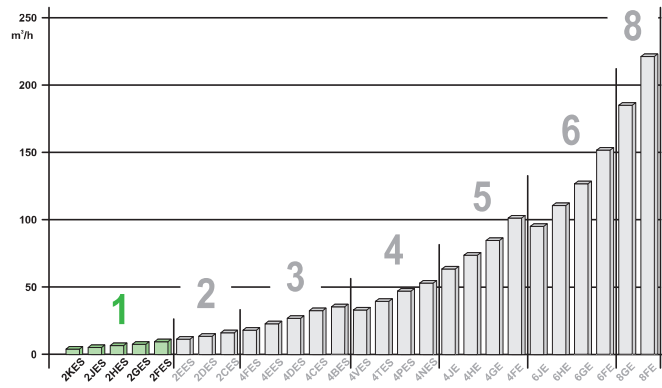
## Special designs

### OCTAGON for R410A and R32



Green: All compressors for R410A and R32 with displacement at 50 Hz

### ECOLINE with single phase motors



Green: All compressors with single phase motor with displacement at 50 Hz

#### 4FDC-5Y .. 4NDC-20Y

These OCTAGON are specialists for refrigerants with demanding pressure levels.

- // wear-resistant drive gear with multilayer bearings resilient to higher pressures
- // highly efficient and robust working valves
- // housing with high pressure strength
  - high pressure side up to 53 barr
  - low pressure side up to 30 bar
- // centrifugal lubrication
- // proven reliability

#### Refrigerants

- // R410A
- // R32

#### Oil charge

- // polyolester oil BSE55

#### Model designation

Example

4 N D C - 20 Y - 40 P

Special design for R410A and R32

4 N D C - 20 Y - 40 P

OCTAGON series

#### Model designation of ECOLINE with single phase motors

Example

2 H E S - 1 . E Y

Special design for single phase motors

#### 2KES-05.EY .. 2FES-2.EY

These compressors with single phase motor may be operated on the public power supply network or with a generator. They are equipped with a starting device.

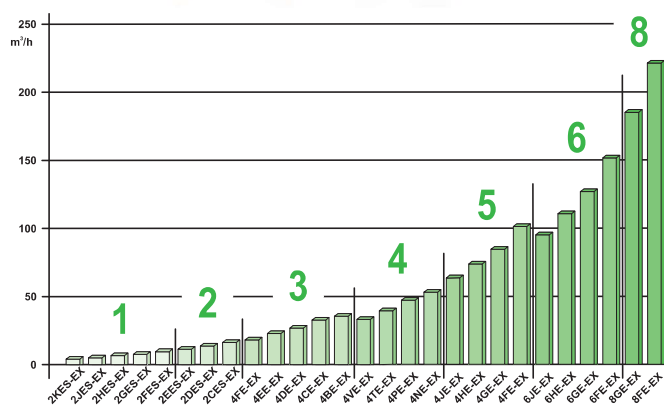
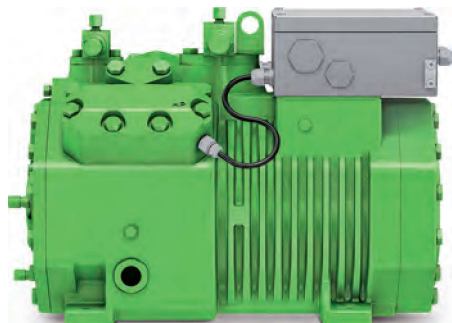
#### Refrigerants

- // R1234yf
- // R513A
- // R450A
- // R134a
- // R454A, R454C
- // R448A
- // R449A
- // R404A
- // R507A
- // R455A
- // R407A, R407C, R407F, R407H
- // R452A
- // R22

#### Oil charge

- // polyolester oil BSE32
- // option, required for  $t_c > 70^\circ\text{C}$ : polyolester oil BSE55
- // option, required for R22: mineral oil B5.2

## ECOLINE for explosion-proof areas



All compressors for explosion-proof areas with displacement at 50 Hz

## Refrigerants

- // R1234yf
- // R513A
- // R450A
- // R134a
- // R448A
- // R449A
- // R404A
- // R507A
- // R407A, R407C, R407F
- // R22
- // R290
- // R1270

## Oil charge

- // oil designation Y: polyolester oil BSE32
- // oil designation P: poly-alpha-olefin SHC226E
- // oil designation Z: polyalkylene glycol oil BSG68K
- // option, required for R22: mineral oil B5.2

## Designs

- // 2KES-05EXY .. 8FE-70EXY
- // 2KESP-05EXZ .. 8FEP-70EXZ
- // 2KESP-05EXP .. 8FEP-70EXP

## Explosion protection equipment for zone 1 and 2

- // terminal box
- // discharge gas temperature sensor in each cylinder head
- // oil monitoring
- // options: oil heater and depending on model capacity control and/or start unloading
- // certified according to ATEX Directive 2014/34/EU (ATEX 114)

## Model designation

Example

2 C E S - 4 EX Y - 40S
Special design for explosion-proof areas
2 C E S P - 4 EX Z - 40S
2 C E S P - 4 EX P - 40S
Special design for explosion-proof areas for A3 refrigerants
2 C E S - 4 EX Y - 40S
Y, Z or P depending on oil charge



## ECOLINE are easy to handle

### Backwards compatible

Each ECOLINE is compatible with its predecessor compressor, both those of the OCTAGON series and the .2 generation compressors.

Predecessor compressors can be substituted without the need for modifying the system.

Whereas many of the major internal components have been redesigned, the outer shape has remained virtually unchanged: the same outer dimensions, unchanged mounting points, valve positions, connections for oil and gas equalisation, as well as for oil level control systems. Only few details give an inkling of the new design inside the compressor, such as slightly higher cylinder heads.

Motor version 2 covers the classic refrigeration applications – medium and low temperature refrigeration – with one single product. In many cases it can thus replace a predecessor compressor with motor version 1.

### Simple pair compounding

as tandem compressor available ex works.

### Retrofittable accessories

All optional accessories are accessible from the outside, for example the discharge gas temperature sensor, the VARISTEP cylinder heads, the IQ MODULE, also an alternative terminal box, the additional fan or the oil heater. The last two components can be mounted without breaking into the refrigeration circuit. Only a special voltage motor and the bearing cover for the oil level monitoring for housing size 1 must already be mounted when delivered.

### Suitable for retrofitting

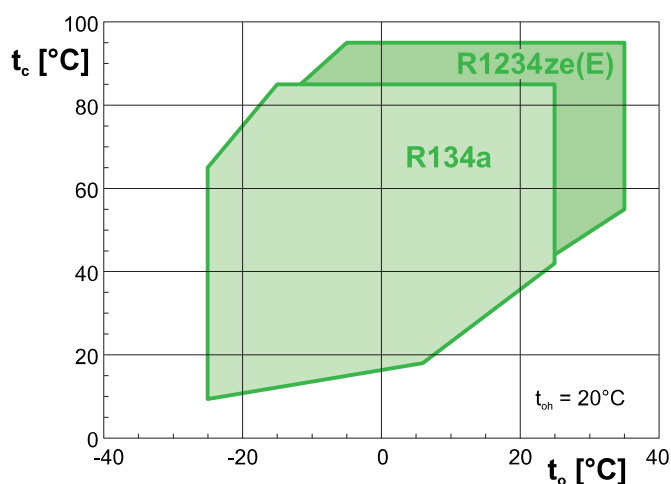
The semi-hermetic ECOLINE compressors are future-proof and suitable for a large number of refrigerants and refrigerant blends. They can also be used with HFO and HFO/HFC blends with GWP below 150.

This also applies to flammable refrigerants of safety class A2L.

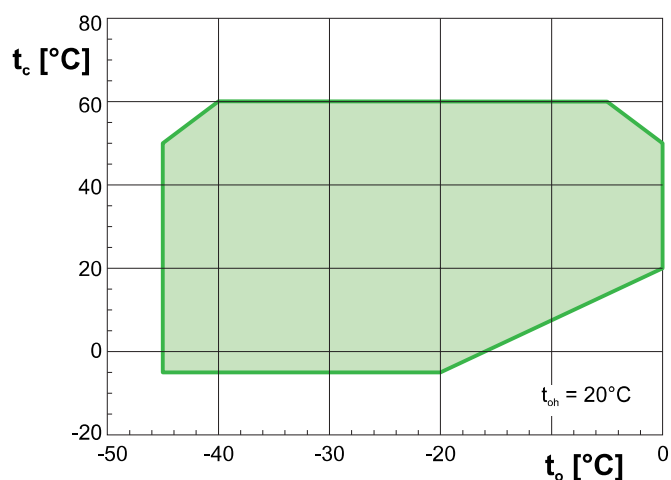
### ECOLINE: compressors with a wide application range

// R1234yf, R513A, R450A and R134a with motor version 1 application limits extended to  $t_c = 85^\circ\text{C}$

// R1234ze(E) with motor version 1 application limits extended to  $t_c = 95^\circ\text{C}$



// R454C, R455A, R448A and R449A with motor version 2 application limits extended to bis  $t_c = 60^\circ\text{C}$  and  $t_c = 0^\circ\text{C}$



### ECOLINE motor version 2

The universal refrigeration compressor for medium and low temperature refrigeration is also suitable for modern systems, for example, with strongly reduced condensing temperature at low ambient temperatures and increased evaporation temperature.



### The accessories: flexible modular system

The ECOLINE have a comprehensive and proven set of options. The following pages describe their functions.

The BITZER accessories create individualised compressors for demanding tasks in modern refrigeration and air conditioning systems. The compressors adapt flexibly to the specific requirements on site.

### ECOLINE with external frequency inverter (FI)

The variable speed operation adapts the capacity of the system exactly to the cooling demand. All 2, 4 and 6 cylinder compressors can be operated with an external FI. They are designed and optimised for FI operation between 30 and 70 Hz – housing sizes 3 to 6 may be controlled down to 25 Hz.

The compressors can be operated in FI mode with all released refrigerants of the standard compressors. The place of installation of the FI when using A2L or A3 refrigerants is subject to the system risk assessment.

Depending on the refrigerant and the operating conditions, a compressor with a standard part winding motor (400V/3/50Hz) can be used for housing size 4 to 6 or a special motor (230V/400V/3/50Hz) connected in delta connection (230V/ $\Delta$ /3/50Hz) may be required. The housing sizes 1 to 3 are equipped as standard with 230/400V/3/50Hz direct starting motors, which are operated either at 400V in star connection or 230V in delta connection, depending on the application.

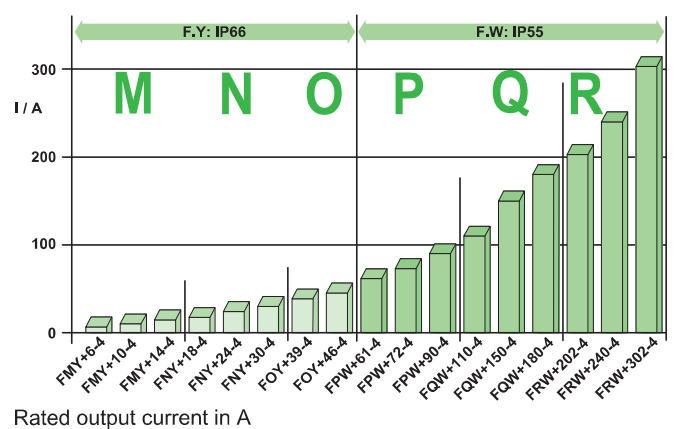
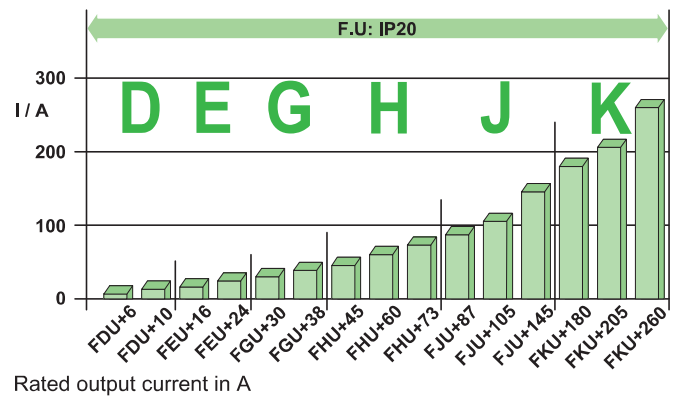
For compressors with the motor version 3, FI operation up to 70 Hz is possible with the standard motor for mains voltage 400V/3/50Hz.

## VARIPACK – External BITZER Frequency Inverters

For easy and safe capacity control, BITZER offers the VARIPACK series: intelligent frequency inverters (FI) of different designs.

The VARIPACK series has been developed especially for refrigeration and the operation of BITZER refrigerant compressors. All ECOLINE compressors can be operated with it.

Focus of development was the simple handling, reliability and high performance of the FI.



### Design and allocation

The VARIPACK frequency inverters are integrated in the BITZER SOFTWARE and can be found by the button "Accessories".

The BITZER SOFTWARE visualises the resulting application limits. This means, a cost-effective and reliable working selection can be done for each application, without the need of deep expert knowledge or manual calculations.

### Place of installation and conditions in power supply

The designs for different environmental conditions:

// F.U with IP20

// F.W with IP55

// F.Y with IP66

All VARIPACK can be operated at a mains voltage between 380 and 480 V.

### Operation

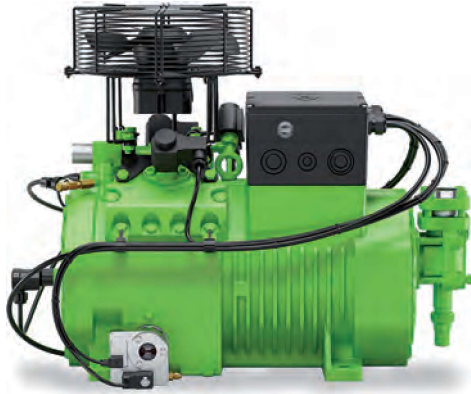
The BEST SOFTWARE for easy communication with VARIPACK:

// configuration

// reading out of messages

// monitoring

## IQ MODULE CM-RC-01



Fully equipped 4 cylinder compressor with discharge gas temperature sensor, pressure transmitters, oil heater, VARISTEP, additional fan, RI system, OLC-D1 and OLM-IQ

The new generation of extended BITZER compressor modules operates, monitors and protects compressors reliably and communicates with the superior controller. Sensors and actuators are factory pre-wired and pre-configured by BITZER.

### The new, extended protection concept

// intelligent operation to improve system efficiency

- oil heater
- VARISTEP capacity control (CRII)
- oil level monitoring with OLM-IQ  
When this option is selected, OLC-D1 or DP-1 can be omitted.
- additional fan
- RI system for refrigerant injection

// monitored compressor parameters

- motor and discharge gas temperature
- oil supply with OLC-D1 or DP-1
- optional high pressure and low pressure
- high pressure switch
- monitoring of application limits

// diagnosis

- An early warning system reports critical operating conditions.
- data log of all digital and analogue inputs and outputs
- history of alarm and warning messages
- operating time and load statistics

// communication

- via Modbus RTU (standardised interface)
- via Bluetooth
- configuration and operation monitoring via the BEST SOFTWARE
- status LEDs for fast initial diagnosis
- prepared for data analysis via the BITZER DIGITAL NETWORK



### The RI system

The RI system injects liquid refrigerant directly into the suction gas chamber of compressor.

// finely metered

// controls continuously

// depending on demand

// cools the cylinder area

// ensures a sufficiently low discharge gas temperature

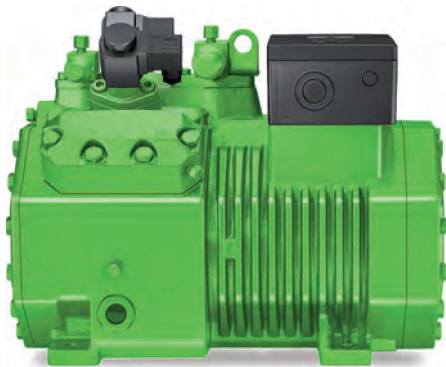
The RI system thus ensures the thermal application limits for low temperature applications, for example with the refrigerants R454C, R407A, R407F, R448A and R449A



## VARISTEP

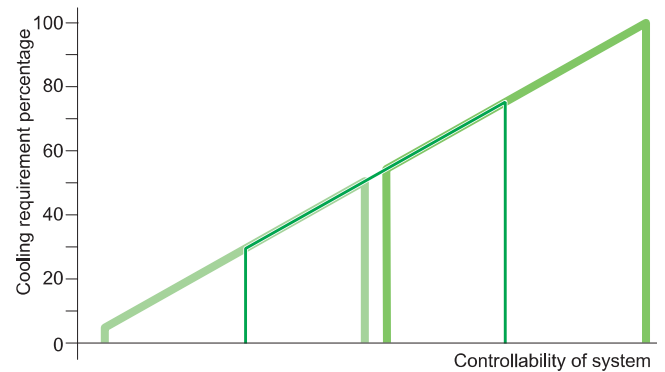
The VARISTEP system is designed for the special requirements of intelligent system controls. It is a fast-acting electromechanical capacity control, in technical documents it is also called CRIL.




VARISTEP is an extension option and can be set up on one, several or all cylinder banks for most ECOLINE.



4-cylinder compressor fully equipped with VARISTEP

- // quasi continuous capacity adjustment
- // fast reaction due to short pulse times
- // innovative control piston design for higher switching frequency
- // on housing size 2 to 6 possible on all cylinder heads
- // capacity control from 100% to 10%, depending on operating conditions and refrigerant with 4 and 6 cylinder compressors
- // conventional slow cycling control still possible
- // system is backwards compatible – previous compressors can be retrofitted with VARISTEP cylinder heads
- // for common refrigerants
- // for part load performance data see BITZER SOFTWARE



-  Compressor with IQ VARISTEP ist operating only.
-  Both compressors are operating:  
Compressor with IQ VARISTEP  
Compressor with VARISTEP at 50%
-  Both compressors are operating:  
Compressor with IQ VARISTEP  
Compressor with VARISTEP at 100%

Controllability of a simple compound of two 4 cylinder compressors: one compressor fully equipped with IQ VARISTEP and one compressor with one VARISTEP controller (resulting control steps: 0 - 50 - 100%)

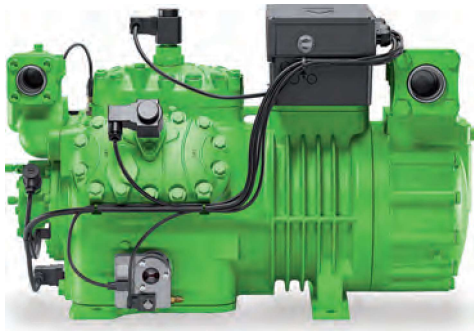
## IQ VARISTEP

The IQ MODULE operates the VARISTEP controllers

- // logic integrated into IQ MODULE
- // IQ VARISTEP also operates with combined logic the additional cooling by fan and RI
- // simple interfaces to the superior system controller
  - digital via Modbus RTU
  - analog via 0 ..10 V
- // also optional for many CO<sub>2</sub> compressors, available ex works

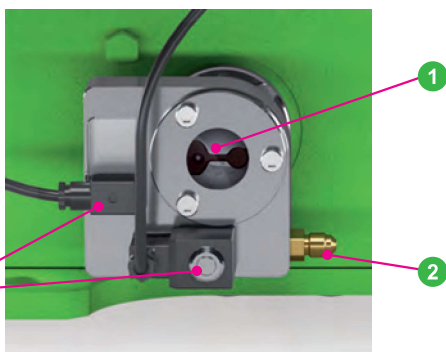
## OLM-IQ

Oil level controller with optimised logic



6-cylinder compressor with IQ MODULE + discharge gas temperature sensor, pressure transmitters, oil heater, VARISTEP, DP-1 and OLM-IQ

- // OLM-IQ actuator sensor unit on compressor
- // logic integrated completely into IQ MODULE
  - trend evaluation
  - integrated in the compressor
  - integrated communication to superior system controller
- // continuous oil level sensor
- // finely controlled oil return
  - stable oil level
- // automatic adaptation to oil supply pressure
- // available for standard refrigerants and CO<sub>2</sub>



OLM-IQ actuator sensor unit

- 1 Oil level sensor in sight glass
- 2 Oil connection 7/16-20 UNF
- 3 Data cable and power supply in IP65



BEST SOFTWARE and BEST APP provide comprehensive access to all operating data and parameters. The BEST SOFTWARE can be downloaded free of charge from the BITZER website ([www.bitzer.de](http://www.bitzer.de)). The BEST APP is also available for free for Android and iOS in the respective app store.

The intuitive user interface provides a complete overview of the operating status including data log for easy maintenance and service. This is completely in line with our innovation targets.

### Communication

- // via BEST interface converter or Bluetooth



### Easy configuration

- // easy device parameterisation
- // storing and installing of device and compressor setups
- // safe and easy firmware update

### Reliable online diagnosis

- // display of all connected sensors, e. g. pressure transmitters, temperature sensors, oil level switches, digital and analogue inputs and outputs
- // current operating conditions within the application limits
- // current capacity control status

### Comfortable analysis

- // data log download and visualisation of all operating parameters
- // alarm list with integrated help function for easy maintenance and service
- // prepared for data analysis via the

## The accessories at a glance

Accessories for semi-hermetic single-stage reciprocating compressors	single compressors	Tandem ①	VARISPEED	for A3 refrigerants	for R410A/R32	with single phase motors	for explosion-proof areas	ECOLINE H
Star or delta motor (40S)	1..3	2..3		1..3	3		1..3	2..3
Part winding motor (40P)	4..8	4..6		4..8	4		4..8	4..6
Special voltage motor	1..8	2..6		1..8	3..4	1	1..8	2..6
Motor and integrated FI			2..4					
Single phase motor with start and run capacitor						1		
Compressor protection device SE-B* with thermal monitoring of motor windings	1..8	2..6	2..4	1..8 ②	3..4	1	1..8 ②	2..6
Terminal box IP66 of plastic	1..4	2..4		1..4	3..4	1		2..4
Terminal box IP54 of metal	5..8	5..6		5..8				5..6
Terminal box IP54 of stainless steel							1..8 ③	
Terminal box IP66 of aluminium	2..6	2..6	2..4	2..6				2..6
Discharge gas shut-off valve	1..8	2..6	2..4	1..8	3..4	1	1..8	2..6
Suction gas shut-off valve	1..8	2..6	2..4	1..8	3..4	1	1..8	2..6
Check valve in discharge outlet with muffler		5..6						
Muffler in discharge gas line		5..6						
Sight glass	1..8	2..6	2..4	1..8	3..4	1	1..8	2..6
Vibration damper	1..8	2..6	2..4	1..8	3..4	1	1..8	2..6
Compressor frame		5..6						
Discharge gas temperature sensor	3..8	3..6	3..4	3..8	3..4		1..8 ④	3..6
Oli heater	1..8	3..6	2..4	1..8	3..4	1	1..8 ③	2..6
Oil monitoring OLC-K1	1..4 ⑤	2..4	2	1..4	3..4	1 ⑤		2..4
Oil monitoring Delta-PII	4..8 ⑥	4..6 ⑥	3..4	4..8 ⑥				4..6 ⑥
Oil monitoring MP54	4..8 ⑥	4..6 ⑥						4..6 ⑥
Oil monitoring MP55				4..8 ⑥				
Oil monitoring OLC, Ex II 2G							1..2 ③	
Oil monitoring INT250EX							3..8 ③	
Oil valve for maintenance	4..6	4..6	4	4..6	4			4..6
Connections for oil and gas equalisation	5..8	5..6		5..8			5..8	5..6
Adaptor for oil and gas equalisation	5..8	5..6		5..8			5..8	5..6
Connection for oil return	1..8	3..6	2..4	1..8	3..4	1	1..8 ③	2..6
Compounding adaptor in place of sight glass	1..4	2..4	3..4	1..8	3..4		1..4	2..4
VARISTEP (CRII system)	2..8	2..6		2..8			3..8 ③⑦	2..6
Start unloading (SU) with discharge gas temperature sensor	4..6	4..6		4..6	4		5..6 ③⑦	4..6
Water cooled cylinder heads	5..6	5..6						5..6
Conversion kit for marine application	5..6			5..6				⑦
Additional fan	1..6	2..6	2..4	1..6	3..4	1		2..6
IQ MODULE (CM-RC-01) with motor temperature monitoring, discharge gas temperature sensor, oil heater and oil monitoring	3..8	3..6						3..6
IQ VARISTEP (IQ MODULE with CRII)	3..8	3..6						3..6
IQ MODULE + start unloading	4..8	4..6						4..6
IQ MODULE + application limits monitoring	3..8	3..6						3..6
IQ MODULE + additional fan	3..6	3..6						3..6
IQ MODULE + RI system	4..6	4..6						4..6
IQ MODULE + connection bridges for direct-on-line start (FI operation)	4..6	4..6						4..6
IQ MODULE + OLM-IQ	3..8	3..6						⑦
BEST interface converter	3..8	3..6	2..4					
Heat insulation for motor housing cover	5..6							5..6
Sound insulation hood			3..4					
Oil charge	1..8	2..6	2..4	1..8	3..4	1	1..8	2..6

The numbers indicate the size of the housing.

**Green numbers:** Component is included in the standard scope of delivery for these housing sizes.

**Black numbers:** Optional components or accessories available for these housing sizes.

① Tandem: all listed components are doubled, except: compressor frame, suction shut-off valve, connection for oil return and components for the suction gas line.

② Compressor protection device for installation in the switch cabinet is included.

③ Special design for explosion-proof area

④ one discharge gas temperature sensor per cylinder head

⑤ For housing size 1: special bearing cover, specify when ordering.

⑥ Pump lubricated 4-compressors are available as special design.

⑦ upon request

## Lubrication system

The housing sizes 1 and 2 are always equipped with centrifugal lubrication, the housing sizes 5 to 8 with oil pump. The housing sizes 3 and 4 can be equipped with centrifugal lubrication or oil pump depending on the series. The centrifugal lubrication is shown in light green in the table, the oil pump version in dark green.

Housing size	1	2	3	4	5	6	8
ECOLINE single compressor				①			
ECOLINE tandem				①			
VARISPEED							
ECOLINE for A3 refrigerants				①			
OCTAGON for R410A and R32							
ECOLINE with single phase motors							
ECOLINE for explosion-proof areas							
ECOLINE H							

① Compressor design with oil pump is available as special design.

## Oil heater

ensures the lubricity of the oil even after long standstill periods. It prevents increased refrigerant dilution in the oil and therefore a reduction of viscosity. The oil heater must be used during standstill in case of:

- // outdoor installation of the compressor
- // long shut-off periods
- // high refrigerant charge
- // risk of refrigerant condensation into the compressor

The CM-RC-01 switches the oil heater on and off as required.

The heat output depends on the housing size:

- // housing size 1: 0 .. 60 W  
PTC heater, self-regulating
- // housing size 2 and 3: 0 .. 120 W  
PTC heater, self-regulating
- // housing size 4: 0 .. 140 W  
PTC heater, self-regulating
- // housing size 5 bis 8: 140 W

## Refrigeration compressor oils

The miscibility of the refrigerant in the oil and the change of lubricity at different temperatures are significant for the selection of the suitable refrigeration compressor oil for the respective application.

Design	Standard	Alternative	with A3	with R22	with R1234ze(E)
ECOLINE single compressor	BSE32	BSE55		B5.2	BSE55 BSE85K
ECOLINE tandem	BSE32	BSE55		B5.2	BSE55 BSE85K
VARISPEED	BSE32	BSE55			BSE55
ECOLINE for A3 refrigerants	BSG68K	SHC226E	BSG68K/ SHC226E		
OCTAGON for R410A and R32	BSE55				
ECOLINE with single phase motors	BSE32	BSE55		B5.2	
ECOLINE for explosion-proof areas	BSE32		BSG68K/ SHC226E	B5.2	
ECOLINE H for transport applications	BSE55	BSE85K			
ECOLINE H for high temperature heat pumps	BSE85K				BSE85K

The alternative oil is predominantly designated for applications with higher temperatures.

## Oil charge code

- // Final letter in the model designation
  - P: SHC oil, poly-alpha-olefin
  - Y: BSE oils, polyolester oils
  - Z: BSG oil, polyalkylene glycol oil for factory-made systems with compact circuits
- // without final letter: B5.2, mineral oil

## Performance data

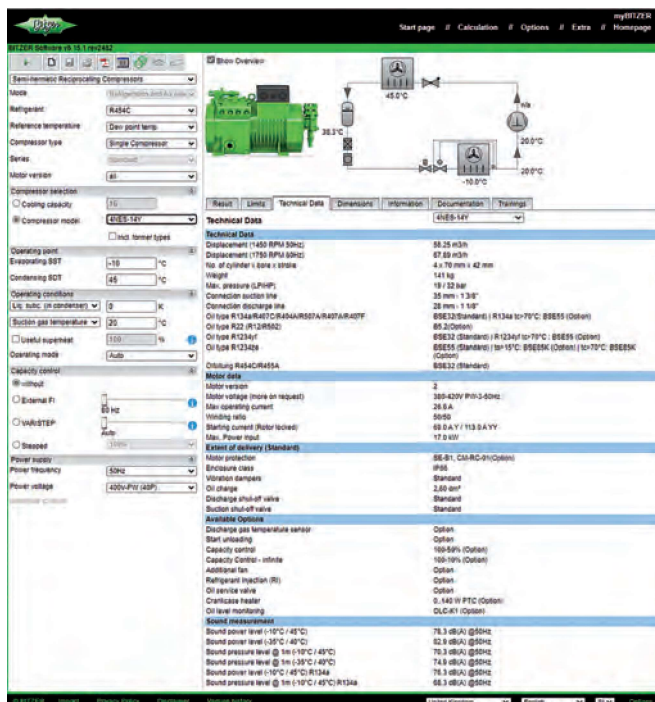


The BITZER SOFTWARE is available in many languages as a download for Windows as well as a web-based version. It is compatible with any browser and always up to date. The program is also suitable for tablets and smartphones.

The BITZER SOFTWARE covers:

- // Performance data for all common refrigerants under freely selectable operating conditions
- // All relevant technical data
- // Application limits
- // Calculation results and individually defined performance tables for compressors
- // Seasonal calculation
- // Dimensional drawings
- // Parallel compounds
- // Available accessories and their selection
- // All relevant technical documents
- // Further BITZER products

bitzer-software.com



## Reference points for evaporating and condensing pressures

The evaporation and condensing temperatures given are determined by the pressure in the pipelines outside the compressor. The pressure drop for the shut-off valves is taken into account.

## Performance data

Performance data are based on the European Standard EN12900 and 50 Hz operation, based on 20°C suction gas temperature without liquid subcooling or 10 K suction gas superheat, also without liquid subcooling. The documented cooling capacity therefore shows lower values than data based on 5 or 8.3 K subcooling.

The evaporation and condensing temperatures refer to "dew point values" (saturated vapour conditions).

20°C suction gas temperature are valid for performance data of the series

- // ECOLINE single and tandem compressor
- // VARISPEED
- // ECOLINE for A3 refrigerants
- // OCTAGON for R410A and with R32 for air conditioning operating conditions
- // ECOLINE with single-phase motors
- // ECOLINE H for transport applications (air conditioning and medium temperature application)

10 K suction gas superheat are valid for performance data at

- // ECOLINE H
  - operating conditions for data center cooling
  - operating conditions for high temperature heat pumps
- // OCTAGON with R32 for medium temperature application

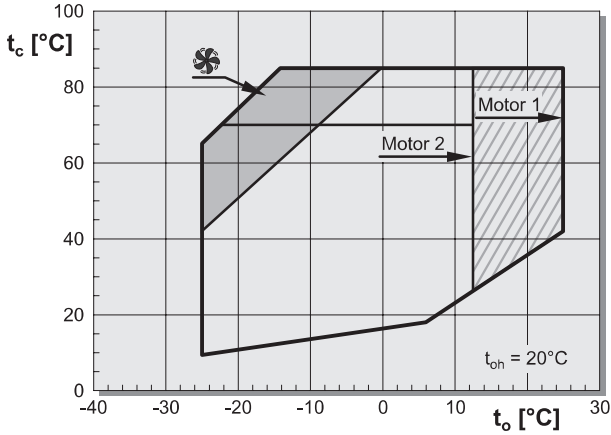
## Individual operating points

For detailed compressor selection with the option of individual input data of all load conditions the BITZER SOFTWARE is available.

## Selected application limits

relating to 20°C suction gas temperature

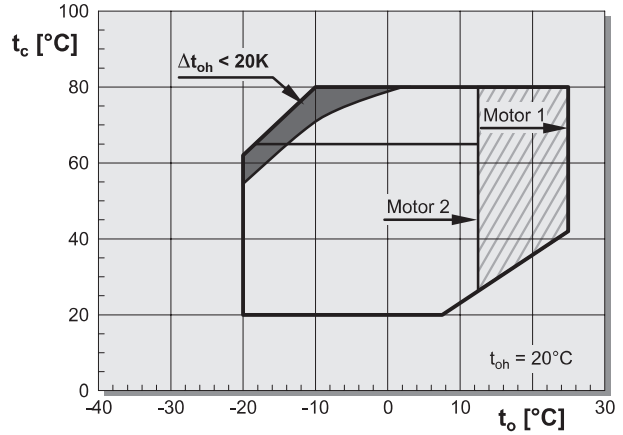
### R1234yf, also applicable for R513A, R450A, R134a



R450A: minimum evaporating temperature: -22°C

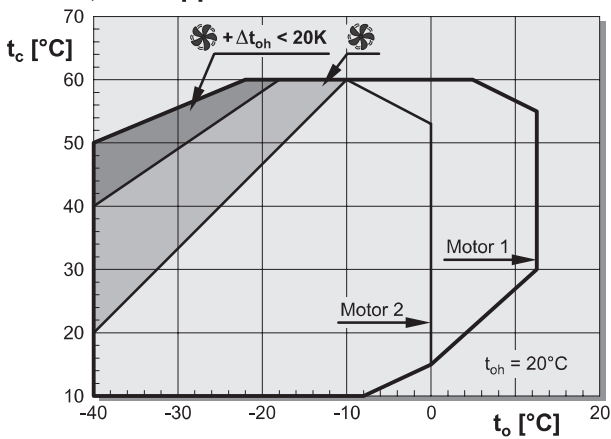
- // 2KES-05Y .. 6FE-50Y
- // 22EES-4Y .. 66FE-100Y
- // 2EESH-2Y .. 6FEH-50Y

### R1234yf, also applicable for R513A, R450A, R134a



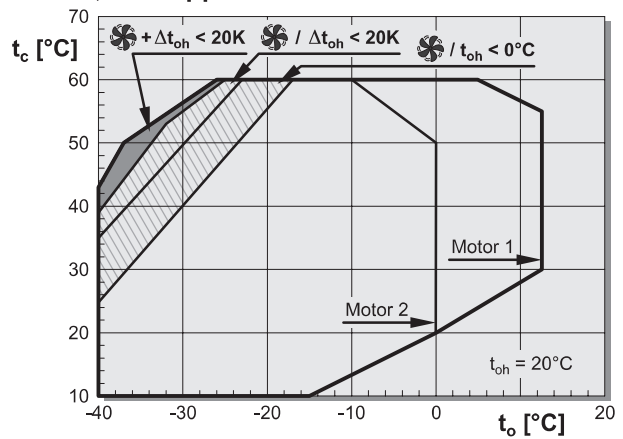
- // 8GE-50Y .. 8FE-70Y
- // 8GE-50EXY .. 8FE-70EXY

### R454C, also applicable for R448A and R449A



- // 2KES-05Y .. 4BES-9Y
- // 22EES-4Y .. 44CES-18Y
- // 2EESH-3Y .. 4BESH-9Y

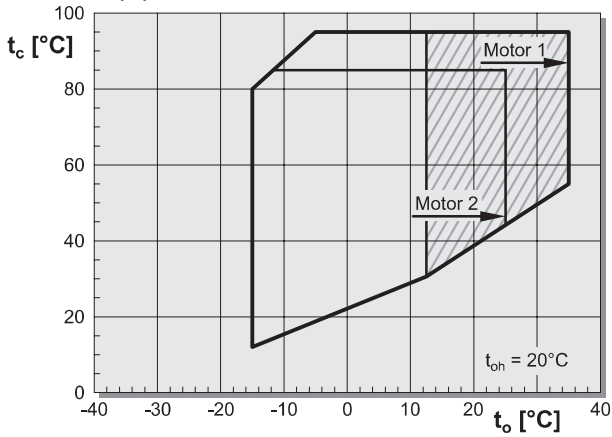
### R454C, also applicable for R448A and R449A



- // 4VES-7Y .. 6FE-50Y
- // 44VES-14Y .. 66FE-100Y
- // 4VEH-7Y .. 6FEH-50Y

Further application limits see BITZER SOFTWARE.

### R1234ze(E)

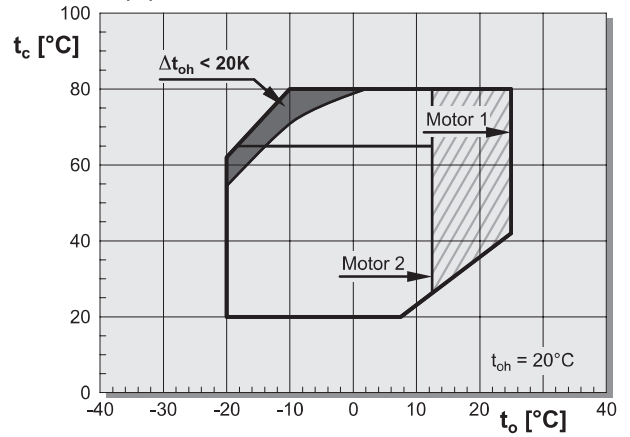


// 2EESH-2Y .. 6FEH-50Y

// 2KES-05Y .. 6FE-50Y: Only operate in motor 2 range.

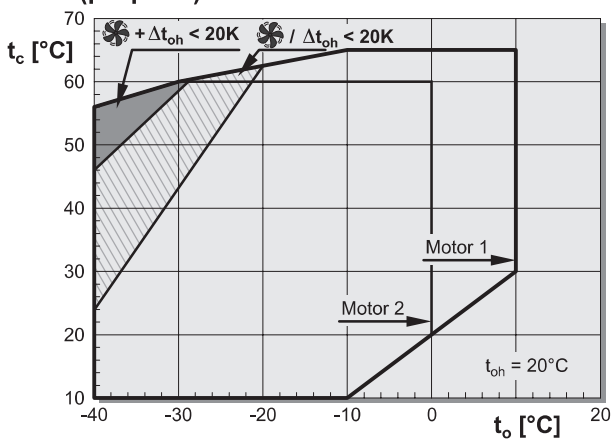
// 22EES-4Y .. 66FE-100Y: Only operate in motor 2 range.

### R1234ze(E)



// 8GE-50Y .. 8FE-70Y

### R290 (propane)



// 2KESP-05Z .. 6FEP-50Z

// 2KESP-05P .. 6FEP-50P

#### Legend

$t_o$  Evaporating temperature (°C)  
 $t_{oh}$  Suction gas temperature (°C)  
 $\Delta t_{oh}$  Suction gas superheat (K)  
 $t_c$  Condensing temperature (°C)

■ Additional cooling required

▨ Additional cooling or limited suction gas superheat required

■ Additional cooling and limited suction gas superheat required

■ Suction gas superheat less than 20 K

▨ Suction gas superheat at least 10 K

Further application limits see BITZER SOFTWARE.



## Technical Data: ECOLINE single compressors

Compressor model	Housing size	Motor version	Displacement at 1450 min <sup>-1</sup> m <sup>3</sup> /h	Number of cylinders	Refrigerating capacity Q <sub>0</sub>				Oil charge dm <sup>3</sup>	Weight kg	Maximum operating current ① A	Maximum power consumption ② kW
					R1234yf		R454C					
					t <sub>0</sub> /t <sub>c</sub> 5°C / 50°C W	t <sub>0</sub> /t <sub>c</sub> -10°C / 45°C W	t <sub>0</sub> /t <sub>c</sub> -10°C / 45°C W	t <sub>0</sub> /t <sub>c</sub> -35°C / 40°C W				
										Δ / Y		
2KES-05(Y)	1	1	4.06	2	1870	1030	1500	310	1.0	46	4.9 / 2.8	1.5
2JES-07(Y)	1	1	5.21	2	2390	1320	2020	480	1.0	47	6.4 / 3.7	1.9
2HES-1(Y)	1	2	6.51	2	3160	1840	2600	640	1.0	47	6.6 / 3.8	2.0
2HES-2(Y)	1	1	6.51	2	3140	1830	2600	640	1.0	49	7.8 / 4.5	2.4
2GES-2(Y)	1	1	7.58	2	3690	2170	3060	780	1.0	49	8.7 / 5.0	2.7
2FES-2(Y)	1	2	9.54	2	4470	2590	3880	1000	1.0	49	9.2 / 5.3	2.9
2FES-3(Y)	1	1	9.54	2	4550	2690	3880	1000	1.0	50	10.6 / 6.1	3.4
2EES-2(Y)	2	2	11.4	2	5760	3340	4860	1290	1.5	74	10.4 / 6.0	3.3
2EES-3(Y)	2	1	11.4	2	5760	3340	4860	1290	1.5	77	13.0 / 7.5	3.8
2DES-2(Y)	2	2	13.4	2	6670	3890	5650	1550	1.5	73	13.0 / 7.5	4.0
2DES-3(Y)	2	1	13.4	2	6670	3890	5650	1550	1.5	77	15.0 / 8.6	4.6
2CES-3(Y)	2	2	16.2	2	8460	4980	7200	2070	1.5	76	15.8 / 9.1	5.0
2CES-4(Y)	2	1	16.2	2	8460	4980	7200	2070	1.5	76	17.4 / 10.0	5.6
4FES-3(Y)	3	2	18.1	4	8980	5140	7890	2230	2.0	90	16.5 / 9.5	5.3
4FES-5(Y)	3	1	18.1	4	8980	5140	7890	2230	2.0	95	18.0 / 10.8	5.8
4EES-4(Y)	3	2	22.7	4	11450	6800	9890	2770	2.0	93	21.1 / 12.2	6.9
4EES-6(Y)	3	1	22.7	4	11450	6800	9890	2770	2.0	95	23.7 / 13.6	7.6
4DES-5(Y)	3	2	26.8	4	13220	7650	11270	3130	2.0	94	25.5 / 14.5	8.1
4DES-7(Y)	3	1	26.8	4	13220	7650	11270	3130	2.0	100	28.7 / 16.5	8.9
4CES-6(Y)	3	2	32.5	4	16770	9790	14380	4160	2.0	99	30.8 / 17.7	9.7
4CES-9(Y)	3	1	32.5	4	16770	9790	14380	4160	2.0	99	35.1 / 20.2	11.3
4BES-9(Y)	3	2	36.1	4	18440	10760	15800	4550	2.0	99	31.3 / 18.0	12.3
											PW	
4VE(S)-7(Y)	4	2	34.7	4	17750	10240	14330	3580	2.6	142 (139)	16.6	11
4VE(S)-10(Y)	4	1	34.7	4	17470	10010	14160	3520	2.6	149 (146)	19.9	12
4TE(S)-9(Y)	4	2	41.3	4	21400	12470	17500	4560	2.6	144 (143)	19.9	13
4TE(S)-12(Y)	4	1	41.3	4	21100	12180	17230	4450	2.6	148 (147)	25.1	14
4PE(S)-12(Y)	4	2	48.5	4	24600	14080	19880	4910	2.6	147 (145)	22.7	17
4PE(S)-15(Y)	4	1	48.5	4	24200	13770	19490	4740	2.6	156 (153)	28.2	19
4NE(S)-14(Y)	4	2	56.2	4	29000	16770	23800	6210	2.6	155 (146)	26.6	17
4NE(S)-20(Y)	4	1	56.2	4	28800	16630	23500	6100	2.6	159 (157)	33.2	19
4JE-15(Y)	5	2	63.5	4	32800	19420	27600	7520	4.0	192	30.8	19
4JE-22(Y)	5	1	63.5	4	32300	18970	26500	6850	4.0	192	37.2	21
4HE-18(Y)	5	2	73.7	4	38400	23100	32400	9070	4.0	191	36.7	22
4HE-25(Y)	5	1	73.7	4	38400	22700	31400	8490	4.0	207	44.0	25
4GE-23(Y)	5	2	84.6	4	43300	25900	37600	10850	4.5	196	43.9	27
4GE-30(Y)	5	1	84.6	4	44800	26500	36100	9940	4.5	209	51.2	28
4FE-28(Y)	5	2	101.8	4	53500	31900	44500	13040	4.5	207	52.8	31
4FE-35(Y)	5	1	101.8	4	52600	31100	43500	12440	4.5	207	62.1	35
6JE-25(Y)	6	2	95.3	6	48600	28400	41100	11240	4.75	234	46.4	27
6JE-33(Y)	6	1	95.3	6	49200	28600	39200	10100	4.75	244	53.2	30
6HE-28(Y)	6	2	110.5	6	57300	33800	47600	13400	4.75	233	53.2	33
6HE-35(Y)	6	1	110.5	6	56600	33100	46100	12530	4.75	241	64.4	36
6GE-34(Y)	6	2	126.8	6	65300	38900	55600	16610	4.75	230	65.5	40
6GE-40(Y)	6	1	126.8	6	65600	38900	52600	14680	4.75	240	73.9	42
6FE-44(Y)	6	2	151.6	6	78700	47100	66800	19540	4.75	244	83.2	46
6FE-50(Y)	6	1	151.6	6	77400	45900	64300	18000	4.75	246	96.2	51
8GE-50(Y)	8	2	185	8	89600	52900			5.0	342	92.0	51
8GE-60(Y)	8	1	185	8	89600	52900	74400		5.0	352	113	63
8FE-60(Y)	8	2	221	8	105000	62500			5.0	361	113	63
8FE-70(Y)	8	1	221	8	105000	62500	88000		5.0	363	139	78

These data also apply to the corresponding design for explosion-proof areas.

Lines with 2 weight values:

first value: compressor with oil pump

value in brackets: compressor with centrifugal lubrication



## ECOLINE tandem

Compressor model	Housing size	Motor version	Displacement at 1450 min <sup>-1</sup> m <sup>3</sup> /h	Number of cylinders	Refrigerating capacity Q <sub>0</sub>				Oil charge dm <sup>3</sup>	Weight kg	Maximum operating current ① A	Maximum power consumption ② kW
					R1234yf		R454C					
					t <sub>0</sub> /t <sub>c</sub> 5°C / 50°C W	t <sub>0</sub> /t <sub>c</sub> -10°C / 45°C W	t <sub>0</sub> /t <sub>c</sub> -10°C / 45°C W	t <sub>0</sub> /t <sub>c</sub> -35°C / 40°C W				
										Δ / Y		
22EES-4(Y)	2	2	22.8	4	11510	6690	9710	2590	3.5	154	2 x 10.4/6.0	2 x 3.3
22EES-6(Y)	2	1	22.8	4	11510	6690	9710	2590	3.5	160	2 x 13.0/7.5	2 x 3.8
22DES-4(Y)	2	2	26.8	4	13340	7790	11290	3100	3.5	154	2 x 13.0/7.5	2 x 4.0
22DES-6(Y)	2	1	26.8	4	13340	7790	11290	3100	3.5	160	2 x 15.0/8.6	2 x 4.6
22CES-6(Y)	2	2	32.4	4	16910	9950	14400	4140	3.5	159	2 x 15.8/9.1	2 x 5.0
22CES-8(Y)	2	1	32.4	4	16910	9950	14400	4140	3.5	159	2 x 17.4/10.0	2 x 5.6
44FES-6(Y)	3	2	36.2	8	17970	10280	15790	4460	4.5	187	2 x 16.5/9.5	2 x 5.3
44FES-10(Y)	3	1	36.2	8	17960	10280	15790	4460	4.5	196	2 x 18.0/10.8	2 x 5.8
44EES-8(Y)	3	2	45.4	8	22900	13600	19770	5540	4.5	192	2 x 21.1/12.2	2 x 6.9
44EES-12(Y)	3	1	45.4	8	22900	13600	19770	5540	4.5	192	2 x 23.7/13.6	2 x 7.6
44DES-10(Y)	3	2	53.6	8	26400	15310	22500	6260	4.5	195	2 x 25.5/14.5	2 x 8.1
44DES-14(Y)	3	1	53.6	8	26400	15310	22500	6260	4.5	201	2 x 28.7/16.5	2 x 8.9
44CES-12(Y)	3	2	65.0	8	33500	19580	28800	8320	4.5	200	2 x 30.8/17.7	2 x 9.7
44CES-18(Y)	3	1	65.0	8	33500	19580	28800	8320	4.5	200	2 x 35.1/20.2	2 x 11.3
											PW	
44VE(S)-14(Y)	4	2	69.4	8	35500	20500	28700	7150	6.1	279 (284)	2 x 16.6	2 x 11
44VE(S)-20(Y)	4	1	69.4	8	34900	20000	28300	7050	6.1	305 (298)	2 x 19.9	2 x 12
44TE(S)-18(Y)	4	2	82.6	8	42900	24900	35000	9110	6.1	295 (291)	2 x 19.9	2 x 13
44TE(S)-24(Y)	4	1	82.6	8	42200	24400	34500	8890	6.1	313 (300)	2 x 25.1	2 x 14
44PE(S)-24(Y)	4	2	97.0	8	49100	28200	39800	9820	6.1	300 (297)	2 x 22.7	2 x 17
44PE(S)-30(Y)	4	1	97.0	8	48300	27500	39000	9490	6.1	315 (309)	2 x 28.2	2 x 19
44NE(S)-28(Y)	4	2	112.4	8	57900	33500	47600	12430	6.1	315 (298)	2 x 26.6	2 x 17
44NE(S)-40(Y)	4	1	112.4	8	57600	33300	47000	12210	6.1	321 (317)	2 x 33.2	2 x 19
44JE-30(Y)	5	2	127.0	8	65700	38800	55300	15030	8.0	385	2 x 30.8	2 x 19
44JE-44(Y)	5	1	127.0	8	64600	37900	53000	13710	8.0	385	2 x 37.2	2 x 21
44HE-36(Y)	5	2	147.4	8	76700	46200	64800	18150	8.0	382	2 x 36.7	2 x 22
44HE-50(Y)	5	1	147.4	8	76800	45300	62700	16990	8.0	403	2 x 44.0	2 x 25
44GE-46(Y)	5	2	169.2	8	86600	51900	75200	21700	9.0	388	2 x 43.9	2 x 27
44GE-60(Y)	5	1	169.2	8	89600	52900	72100	19890	9.0	408	2 x 51.2	2 x 28
44FE-56(Y)	5	2	203.6	8	107000	63900	89000	26100	9.0	404	2 x 52.8	2 x 31
44FE-70(Y)	5	1	203.6	8	105200	62300	87100	24900	9.0	404	2 x 62.1	2 x 35
66JE-50(Y)	6	2	190.6	12	97100	56800	82200	22500	9.5	469	2 x 46.4	2 x 27
66JE-66(Y)	6	1	190.6	12	98300	57300	78300	20200	9.5	489	2 x 53.2	2 x 30
66HE-56(Y)	6	2	221.0	12	114500	67600	95200	26800	9.5	465	2 x 53.2	2 x 33
66HE-70(Y)	6	1	221.0	12	113200	66200	92100	25100	9.5	475	2 x 64.4	2 x 36
66GE-68(Y)	6	2	253.6	12	130700	77800	111200	33200	9.5	460	2 x 65.5	2 x 40
66GE-80(Y)	6	1	253.6	12	131100	77700	105300	29400	9.5	489	2 x 73.9	2 x 42
66FE-88(Y)	6	2	303.2	12	157500	94100	133500	39100	9.5	482	2 x 83.2	2 x 46
66FE-100(Y)	6	1	303.2	12	154700	91700	128700	36000	9.5	485	2 x 96.2	2 x 51

① Data for star or delta motor refer 400 V/3/50 Hz at direct mains operation, as well as the data for the part winding motor at 50 Hz.

② Consider the maximum operating current / maximum power consumption for the selection of contactors, cables and fuses.  
Contactors: operational category AC3. Use thermal overload relays to limit max. operating current.

### Tolerances

refrigerating capacity according to EN12900  
weight ± 5%  
maximum operating current ± 5%  
maximum power consumption ± 5%



## ECOLINE for A3 refrigerants

Compressor model	Housing size	Motor version	Displacement at 1450 min <sup>-1</sup> m <sup>3</sup> /h	Number of cylinders	Refrigerating capacity Q <sub>o</sub>				Oil charge dm <sup>3</sup>	Weight kg	Maximum operating current ① A	Maximum power consumption ② kW
					R290		R1270					
					t <sub>o</sub> /t <sub>c</sub> 5°C / 50°C W	t <sub>o</sub> /t <sub>c</sub> -10°C / 45°C W	t <sub>o</sub> /t <sub>c</sub> -10°C / 45°C W	t <sub>o</sub> /t <sub>c</sub> -35°C / 40°C W				
										Δ / Y		
2KESP-05Z	1	1	4.06	2	2710	1620	1840	470	1.0	46	4.9 / 2.8	1.5
2JESP-07Z	1	1	5.21	2	3550	2190	2600	770	1.0	47	6.4 / 3.7	1.9
2HESP-1Z	1	2	6.51	2		2770	3340	1070	1.0	47	6.6 / 3.8	2.0
2HESP-2Z	1	1	6.51	2	4500	2810	3410	1110	1.0	49	7.8 / 4.5	2.4
2GESP-2Z	1	1	7.58	2	5210	3260	3820	1200	1.0	49	8.7 / 5.0	2.7
2FESP-2Z	1	2	9.54	2		4090	5000	1700	1.0	49	9.2 / 5.3	2.9
2FESP-3Z	1	1	9.54	2	6540	4100	4960	1650	1.0	50	10.6 / 6.1	3.4
2EESP-2Z	2	2	11.4	2		5030	6140	1990	1.5	74	10.4 / 6.0	3.3
2EESP-3Z	2	1	11.4	2	8260	5030	6140	1990	1.5	77	13.0 / 7.5	3.8
2DESP-2Z	2	2	13.4	2		5840	7120	2350	1.5	73	13.0 / 7.5	4.0
2DESP-3Z	2	1	13.4	2	9560	5840	7120	2350	1.5	77	15.0 / 8.6	4.6
2CESP-3Z	2	2	16.2	2		7440	9060	3070	1.5	76	15.8 / 9.1	5.0
2CESP-4Z	2	1	16.2	2	12100	7440	9060	3070	1.5	76	17.4 / 10.0	5.6
4FESP-3Z	3	2	18.1	4		7900	9640	3070	2.0	90	16.5 / 9.5	5.3
4FESP-5Z	3	1	18.1	4	13030	7900	9640	3070	2.0	95	18.0 / 10.8	5.8
4EESP-4Z	3	2	22.7	4		10070	12280	3980	2.0	93	21.1 / 12.2	6.9
4EESP-6Z	3	1	22.7	4	16540	10070	12280	3980	2.0	95	23.7 / 13.6	7.6
4DESP-5Z	3	2	26.8	4		11690	14250	4710	2.0	94	25.5 / 14.5	8.1
4DESP-7Z	3	1	26.8	4	19140	11690	14250	4710	2.0	100	28.7 / 16.5	8.9
4CESP-6Z	3	2	32.5	4		14900	18120	6160	2.0	99	30.8 / 17.7	9.7
4CESP-9Z	3	1	32.5	4	24200	14890	18120	6160	2.0	99	35.1 / 20.2	11.3
											PW	
4VESP-7Z	4	2	34.7	4		15330	20000	6820	2.6	139	16.6	11
4VESP-10Z	4	1	34.7	4	25200	15320	19370	6330	2.6	146	19.9	12
4TESP-9Z	4	2	41.3	4		18580	24000	8320	2.6	143	19.9	13
4TESP-12Z	4	1	41.3	4	30400	18580	23400	7790	2.6	145	25.1	14
4PESP-12Z	4	2	48.5	4		21100	27300	8990	2.6	145	22.7	17
4PESP-15Z	4	1	48.5	4	34900	21100	26600	8440	2.6	153	28.2	19
4NESP-14Z	4	2	56.2	4		25000	32000	10720	2.6	146	26.6	17
4NESP-20Z	4	1	56.2	4	41100	25000	31300	10180	2.6	157	33.2	19
4JEP-15Z	5	2	63.5	4		28800	35800	11870	4.0	192	30.8	19
4JEP-22Z	5	1	63.5	4	46400	28200	35200	11350	4.0	192	37.2	21
4HEP-18Z	5	2	73.7	4		34100	42600	14670	4.0	191	36.7	22
4HEP-25Z	5	1	73.7	4	54700	33500	41500	13720	4.0	207	44.0	25
4GEP-23Z	5	2	84.6	4		39300	48300	16310	4.5	196	43.9	27
4GEP-30Z	5	1	84.6	4	63300	39000	47900	16010	4.5	209	51.2	28
4FEP-28Z	5	2	101.8	4		47500	57700	19540	4.5	207	52.8	31
4FEP-35Z	5	1	101.8	4	75500	46500	56600	18600	4.5	207	62.1	35
6JEP-25Z	6	2	95.3	6		43200	53000	17240	4.75	234	46.4	27
6JEP-33Z	6	1	95.3	6	69500	42400	51900	16350	4.75	244	53.2	30
6HEP-28Z	6	2	110.5	6		51100	61600	20200	4.75	233	53.2	33
6HEP-35Z	6	1	110.5	6	82000	50300	61000	19650	4.75	241	64.4	36
6GEP-34Z	6	2	126.8	6		59000	69900	22600	4.75	230	65.5	40
6GEP-40Z	6	1	126.8	6	94700	58200	70000	22500	4.75	240	73.9	42
6FEP-44Z	6	2	151.6	6		71200	82300	26000	4.75	244	83.2	46
6FEP-50Z	6	1	151.6	6	113300	69700	83100	26400	4.75	246	96.2	51
8GEP-50Z	8	2	185	8		79500	92000		5.0	342	92.0	51
8GEP-60Z	8	1	185	8	131300	80200	95500		5.0	352	113	63
8FEP-60Z	8	2	221	8		94100	108800		5.0	361	113	63
8FEP-70Z	8	1	221	8	154100	94900	113000		5.0	363	139	78

These data also apply to the corresponding design for 2KESP-05P to 8FEP-70P compressors and the corresponding design for explosion-proof areas.

### Tolerances

refrigerating capacity according to EN12900

weight ± 5%

maximum operating current ± 5%

maximum power consumption ± 5%

## VARISPEED

Compressor model	Housing size	Motor version	Displacement at 87 Hz m <sup>3</sup> /h	Number of cylinders	Refrigerating capacity Q <sub>o</sub>				Oil charge dm <sup>3</sup>	Weight kg	Maximum operating current ① A	Maximum power consumption ② kW
					R1234yf		R454C					
					t <sub>o</sub> /t <sub>c</sub> 5°C/50°C W	t <sub>o</sub> /t <sub>c</sub> -10°C/45°C W	t <sub>o</sub> /t <sub>c</sub> -10°C/45°C W	t <sub>o</sub> /t <sub>c</sub> -35°C/40°C W				
2DES-3.F1Y	2	1	23.7	2	11230	6550	9500	2610	1.5	89	15	9
4FE-5.F1Y	3	1	32.0	4	15120	8650	13290	3750	2.0	108	20	11
4EE-6.F1Y	3	1	40.1	4	19280	11440	16640	4670	2.0	110	22	12
4DE-5.F1Y	3	2	47.3	4	22300	12880			2.0	108	22	12
4DE-7.F3Y	3	1	47.3	4	22300	12880	18970	5270	2.0	146	28	17
4CE-6.F1Y	3	2	57.4	4	28200	16480			2.0	113	22	12
4CE-9.F3Y	3	1	57.4	4	28200	16480	24200	7000	2.0	145	34	21
4VE-7.F3Y	4	2	61.3	4	29900	17230			2.6	159	23	14
4VE-10.F4Y	4	1	61.3	4	29400	16850	23800	5930	2.6	169	35	22
4TE-9.F3Y	4	2	73.0	4	36100	21000			2.6	162	26	16
4TE-12.F4Y	4	1	73.0	4	35500	20500	29000	7480	2.6	171	42	26
4PE-12.F3Y	4	2	85.6	4	41300	23700			2.6	168	30	19
4PE-15.F4Y	4	1	85.6	4	40700	23200	32800	7990	2.6	177	48	30
4NE-14.F3Y	4	2	99.2	4	48700	28200			2.6	177	34	22
4NE-20.F4Y	4	1	99.2	4	48400	28000	39600	10270	2.6	179	55	36

## OCTAGON for R410A and R32

Compressor model	Housing size	Motor version	Displacement at 1450 min <sup>-1</sup> m <sup>3</sup> /h	Number of cylinders	Refrigerating capacity Q <sub>o</sub>				Oil charge dm <sup>3</sup>	Weight kg	Maximum operating current ① A	Maximum power consumption ② kW
					R410A		R32					
					t <sub>o</sub> /t <sub>c</sub> 5°C/50°C W	t <sub>o</sub> /t <sub>c</sub> -10°C/45°C W	t <sub>o</sub> /t <sub>c</sub> 5°C/50°C W	t <sub>o</sub> /t <sub>c</sub> -10°C/45°C W				
											Δ / Y	
4FDC-5Y	3	1	12.4	4	13150	8050	14640	8940	2.0	105	18.4 / 10.6	6.4
4EDC-6Y	3	1	15.6	4	16740	10240	18640	11370	2.0	107	22.9 / 13.2	8.1
4DDC-7Y	3	1	18.4	4	19910	12150	22200	13500	2.0	107	27.7 / 16.0	9.6
4CDC-9Y	3	1	22.3	4	24000	14770	26800	16420	2.0	110	32.9 / 19.0	11.6
											PW	
4VDC-10Y	4	1	28.9	4	31600	19190	35300	21400	2.6	159	23.0	14.3
4TDC-12Y	4	1	34.4	4	37200	22800	41400	25300	2.6	158	27.0	16.5
4PDC-15Y	4	1	40.4	4	44800	27200	49800	30200	2.6	181	32.0	19.8
4NDC-20Y	4	1	46.9	4	52200	31700	58000	35200	2.6	180	37.0	23.2

## ECOLINE with single phase motors

Compressor model	Housing size	Motor version	Displacement at 1450 min <sup>-1</sup> m <sup>3</sup> /h	Number of cylinders	Refrigerating capacity Q <sub>o</sub>				Oil charge dm <sup>3</sup>	Weight kg	Maximum power consumption ④ A
					R1234yf		R454C				
					t <sub>o</sub> /t <sub>c</sub> 5°C/50°C W	t <sub>o</sub> /t <sub>c</sub> -10°C/45°C W	t <sub>o</sub> /t <sub>c</sub> -10°C/45°C W	t <sub>o</sub> /t <sub>c</sub> -35°C/40°C W			
2KES-05.EY	1	2	4.06	2	⑤	⑤	⑤		1.0	49	⑤
2JES-07.EY	1	2	5.21	2	⑤	⑤	⑤		1.0	50	⑤
2HES-1.EY	1	2	6.51	2	3160	1840	2600		1.0	50	12.5
2HES-2.EY	1	1	6.51	2	3140	1830	2600		1.0	52	13.5
2GES-2.EY	1	1	7.58	2	3690	2170	3060		1.0	52	12.5
2FES-2.EY	1	1	9.54	2	4470	2590	3880		1.0	52	15.0

① Data for star or delta motor refer 400 V/3/50 Hz at direct mains operation, as well as the data for the part winding motor at 50 Hz.

② Consider the maximum operating current / maximum power consumption for the selection of contactors, cables and fuses. Contactors: operational category AC3. Use thermal overload relays to limit max. operating current.

③ Data apply to the FI input. Operation on generators, emergency power generators and networks with power factor correction systems only after consultation with BITZER.

Operation with mains voltage ≥ 420 V with F3 or F4 frequency inverter: Set with BEST SOFTWARE.

④ Motor data refer to 230 V/1/50 Hz. Consider maximum power consumption for the selection of contactors, cables and fuses. To limit the maximum operating current an thermal overload relays may be used.

⑤ Data for 60 Hz operation upon request



## ECOLINE H

Compressor model	Housing size	Motor version	Displacement at 1450 min <sup>-1</sup> m <sup>3</sup> /h	Number of cylinders	Refrigerating capacity Q <sub>o</sub>				Oil charge dm <sup>3</sup>	Weight kg	Maximum operating current ① A	Maximum power consumption ② kW
					R1234yf		R515B					
					t <sub>o</sub> / t <sub>c</sub> 5°C / 50°C W	t <sub>o</sub> / t <sub>c</sub> -10°C / 45°C W	t <sub>o</sub> / t <sub>c</sub> 20°C / 45°C W	t <sub>o</sub> / t <sub>c</sub> 30°C / 85°C W				
										Δ / Y		
2EESH-2Y	2	2	11.4	2	5760	3340			1.5	74	10.4 / 6.0	3.3
2EESH-3Y	2	1	11.4	2	5760	3340	11080	6540	1.5	77	13.0 / 7.5	3.8
2DESH-2Y	2	2	13.4	2	6670	3890			1.5	73	13.0 / 7.5	4.0
2DESH-3Y	2	1	13.4	2	6670	3890	12780	7590	1.5	77	15.0 / 8.6	4.6
2CESH-3Y	2	2	16.2	2	8460	4980			1.5	76	15.8 / 9.1	5.0
2CESH-4Y	2	1	16.2	2	8460	4980	16080	9660	1.5	76	17.4 / 10.0	5.6
4FESH-3Y	3	2	18.1	4	8980	5140			2.0	90	16.5 / 9.5	5.3
4FESH-5Y	3	1	18.1	4	8980	5140	17700	10060	2.0	95	18.0 / 10.8	5.8
4EESH-4Y	3	2	22.7	4	11450	6800			2.0	93	21.1 / 12.2	6.9
4EESH-6Y	3	1	22.7	4	11450	6800	21800	12920	2.0	95	23.7 / 13.6	7.6
4DESH-5Y	3	2	26.8	4	13220	7650			2.0	94	25.5 / 14.5	8.1
4DESH-7Y	3	1	26.8	4	13220	7650	25800	14890	2.0	100	28.7 / 16.5	8.9
4CESH-6Y	3	2	32.5	4	16770	9790			2.0	99	30.8 / 17.7	9.7
4CESH-9Y	3	1	32.5	4	16770	9790	32500	18980	2.0	99	35.1 / 20.2	11.3
4BESH-9Y	3	2	36.1	4	18440	10760			2.0	99	31.3 / 18.0	12.3
											PW	
4VEH-7Y	4	2	34.7	4	17750	10240			2.6	142	16.6	11
4VEH-10Y	4	1	34.7	4	17470	10010	34300	19930	2.6	149	19.9	12
4TEH-9Y	4	2	41.3	4	21400	12470			2.6	144	19.9	13
4TEH-12Y	4	1	41.3	4	21100	12180	41100	24200	2.6	148	25.1	14
4PEH-12Y	4	2	48.5	4	24600	14080			2.6	147	22.7	17
4PEH-15Y	4	1	48.5	4	24200	13770	47600	27500	2.6	156	28.2	19
4NEH-14Y	4	2	56.2	4	29000	16770			2.6	155	26.6	17
4NEH-20Y	4	1	56.2	4	28800	16630	56000	33000	2.6	159	33.2	19
4JEH-15Y	5	2	63.5	4	32800	19420			4.0	192	30.8	19
4JEH-22Y	5	1	63.5	4	32300	18970	61600	36500	4.0	192	37.2	21
4HEH-18Y	5	2	73.7	4	38400	23100			4.0	191	36.7	22
4HEH-25Y	5	1	73.7	4	38400	22700	73000	43100	4.0	207	44.0	25
4GEH-23Y	5	2	84.6	4	43300	25900			4.5	196	43.9	27
4GEH-30Y	5	1	84.6	4	44800	26500	85200	50000	4.5	209	51.2	28
4FEH-28Y	5	2	101.8	4	53500	31900			4.5	207	52.8	31
4FEH-35Y	5	1	101.8	4	52600	31100	100000	59800	4.5	207	62.1	35
6JEH-25Y	6	2	95.3	6	48600	28400			4.75	234	46.4	27
6JEH-33Y	6	1	95.3	6	49200	28600	94600	56300	4.75	244	53.2	30
6HEH-28Y	6	2	110.5	6	57300	33800			4.75	233	53.2	33
6HEH-35Y	6	1	110.5	6	56600	33100	108200	64600	4.75	241	64.4	36
6GEH-34Y	6	2	126.8	6	65300	38900			4.75	230	65.5	40
6GEH-40Y	6	1	126.8	6	65500	38900	123400	74800	4.75	240	73.9	42
6FEH-44Y	6	2	151.6	6	78700	47100			4.75	244	83.2	46
6FEH-50Y	6	1	151.6	6	77400	45900	147800	84900	4.75	246	96.2	51

① Data for star or delta motor refer 400 V/3/50 Hz at direct mains operation, as well as the data for the part winding motor at 50 Hz.

② Consider the maximum operating current / maximum power consumption for the selection of contactors, cables and fuses. Contactors: operational category AC3. Use thermal overload relays to limit max. operating current.

### Tolerances

refrigerating capacity according to EN12900

weight ± 5%

maximum operating current ± 5%

maximum power consumption ± 5%

### Operating points

t<sub>o</sub> / t<sub>c</sub> = 5°C / 50°C

standard point for air conditioning

t<sub>o</sub> / t<sub>c</sub> = -10°C / 45°C

standard point for medium temperature application

t<sub>o</sub> / t<sub>c</sub> = 20°C / 45°C

typical for data center cooling

t<sub>o</sub> / t<sub>c</sub> = 30°C / 85°C

typical for high temperature heat pumps

## Standard motors

// Housing size 1 to 3:

- motor for direct-on-line start in star or delta wiring ( $\Delta$  / Y)
- 220 .. 240 V: start in delta wiring ( $\Delta$ ) or 380 .. 420 V: start in star wiring (Y) with 3 phases and 50 Hz
- 265 .. 290 V, start in delta wiring ( $\Delta$ ) or 440 .. 480 V, start in star wiring (Y) with 3 phases and 60 Hz

// Housing size 4 to 6:

- motor for part winding start (PW)
- 380 .. 420 V in star wiring (YY) with 3 phases and 50 Hz
- 440 .. 480 V in star wiring (YY) with 3 phases and 60 Hz
- exception: 6FE-50(Y): 380 .. 400 V in star wiring (YY) with 3 phases and 50 Hz  
440 .. 460 V in star wiring (YY) with 3 phases and 60 Hz
- winding partition 50%/50% (Y/YY)
- Select motor contactors for approx. 60% of the maximum operating current.

// Housing size 8:

- motor for part winding start (PW)
- 380 .. 420 V in delta wiring ( $\Delta\Delta$ ) with 3 phases and 50 Hz
- 440 .. 460 V in delta wiring ( $\Delta\Delta$ ) with 3 phases and 60 Hz
- winding partition 60%/40% ( $\Delta/\Delta\Delta$ )
- Select first motor contactor for approx. 70% of the maximum operating current and second motor contactor for approx. 50%.

// Housing size 4 to 8:

Special voltage motor for star-delta start (Y/ $\Delta$ ) upon request.

## Dimensional drawings

The following pages show the dimensional drawings of the compressors in their standard scope of delivery. CAD data of the compressors including all options can be found as 2D dxf drawings and 3D STP models on the website [www.bitzer.de](http://www.bitzer.de) and in the BITZER SOFTWARE.

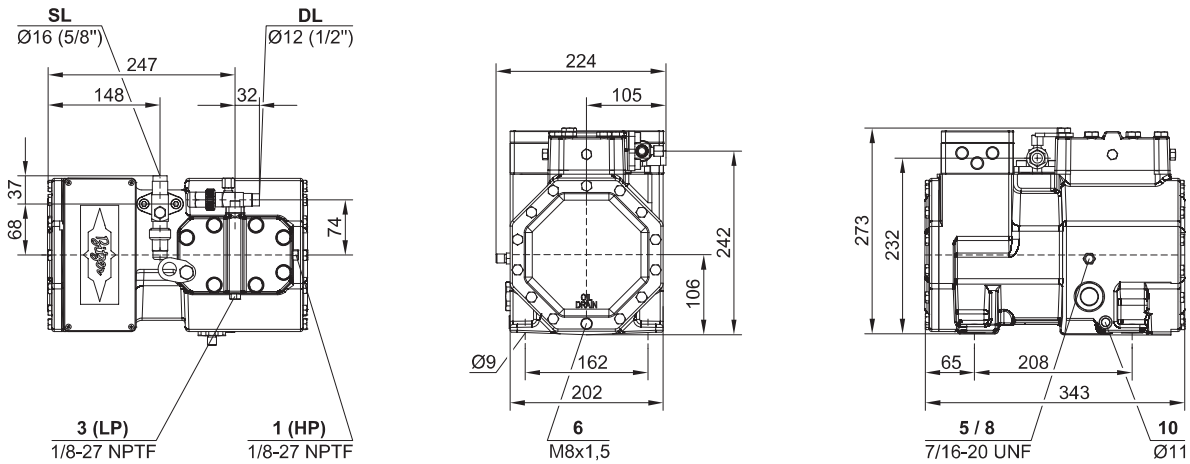
### Connection positions

1	High pressure connection (HP) Connection for high pressure switch (HP))
2	Connection for discharge gas temperature sensor (HP) (4VE(S)-6Y .. 4NE(S)-20(Y): connection for RI sensor as an alternative)
3	Low pressure connection (LP) Connection for low pressure switch (LP)
4	Connection for RI injection nozzle (LP)
5	Oil fill plug
6	Oil drain
7	Oil filter (magnetic screw)
8	Oil return (from oil separator)
9	Connection for oil and gas equalisation (parallel operation)
9a	Gas equalisation
9b	Oil equalisation
10	Connection for oil heater
11	Oil pressure connection +
12	Oil pressure connection –
16	Connection for oil monitoring (opto-electronic oil monitoring "OLC-K1" or differential oil pressure switch "Delta-PII")
SL	Suction gas line
DL	Discharge gas line

Dimensions may have tolerances according to EN ISO 13920-B.

## Dimensional drawings

### Housing size 1



#### Compressor models

standard design:

2KES-05(Y), 2JES-07(Y), 2HES-1(Y), 2HES-2(Y), 2GES-2(Y), 2FES-2(Y), 2FES-3(Y)

for A3 refrigerants:

2KESP-05Z, 2JESP-07Z, 2HESP-1Z, 2HESP-2Z, 2GES-2Z, 2FESP-2Z, 2FESP-3Z and  
2KESP-05P, 2JESP-07P, 2HESP-1P, 2HESP-2P, 2GES-2P, 2FESP-2P, 2FESP-3P

with single phase motors:

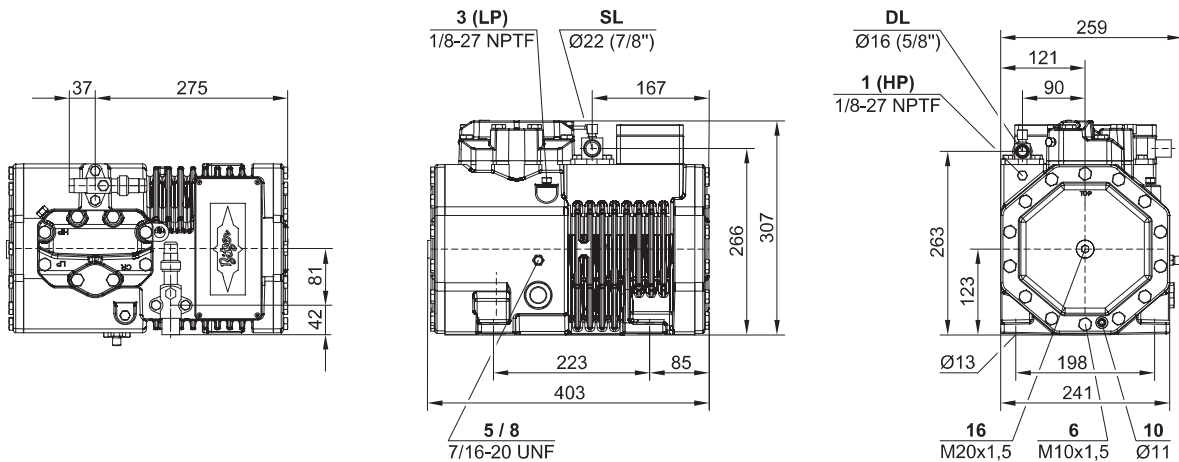
2KES-05.EY, 2JES-07.EY, 2HES-1.EY, 2HES-2.EY, 2GES-2.EY, 2FES-2.EY

special design for explosion-proof areas:

2KES-05EXY, 2JES-07EXY, 2HES-1EXY, 2HES-2EXY, 2GES-2EXY, 2FES-2EXY, 2FES-3EXY,  
also 2KESP-05EXZ .. 2FESP-3EXZ and 2KESP-05EXP .. 2FESP-3EXP

Figure similar, terminal box is larger.

### Housing size 2



#### Compressor models

standard design:

2EES-2(Y), 2EES-3(Y), DES-2(Y), 2DES-3(Y), 2CES-3(Y), 2CES-4(Y)

for A3 refrigerants:

2EESP-2Z, 2EESP-3Z, 2DESP-2Z, 2DESP-3Z, 2CESP-3Z, 2CESP-4Z and 2EESP-2P, 2EESP-3P,  
2DESP-2P, 2DESP-3Z, 2CESP-3P, 2CE-SP-4P

ECOLINE H:

2EESH-2Y, 2EESH-3Y, 2DESH-2Y, 2DESH-3Y, 2CESH-3Y, 2CESH-4Y

special design for explosion-proof areas:

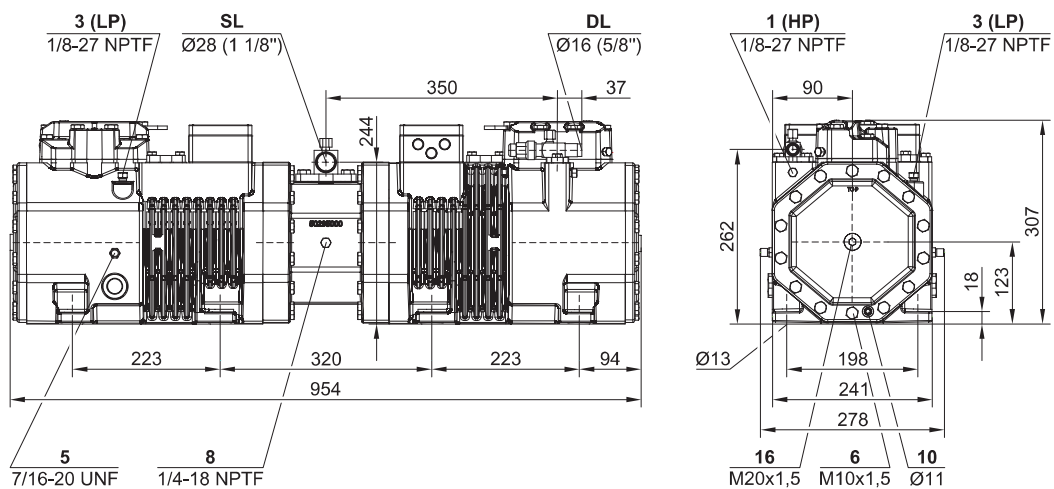
2EES-2EXY, 2EES-3EXY, 2DES-2EXY, 2DES-3EXY, 2CES-3EXY, 2CES-4EXY,  
also 2EESP-2EXZ .. 2CESP-4EXZ and 2EESP-2EXP .. 2CESP-4EXP

Figure similar, terminal box is larger.

Connection positions see page 29.

## Dimensional drawings

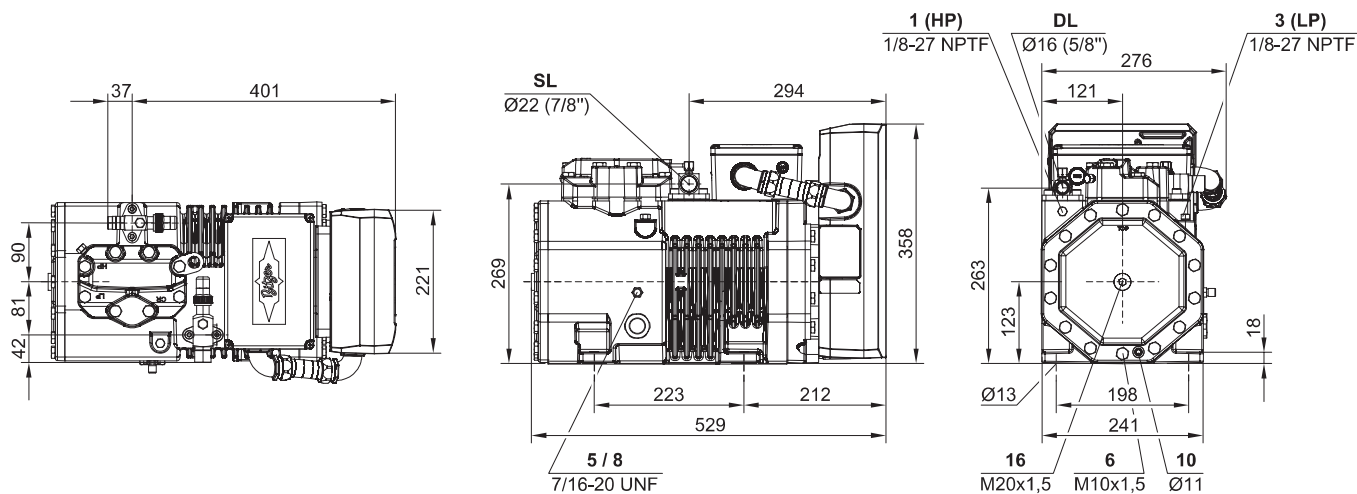
### Tandem



### Compressor models

22EES-4(Y), 22EES-6(Y), 22DES-4(Y), 22DES-6(Y), 22CES-6(Y), 22CES-8(Y)

### VARISPEED



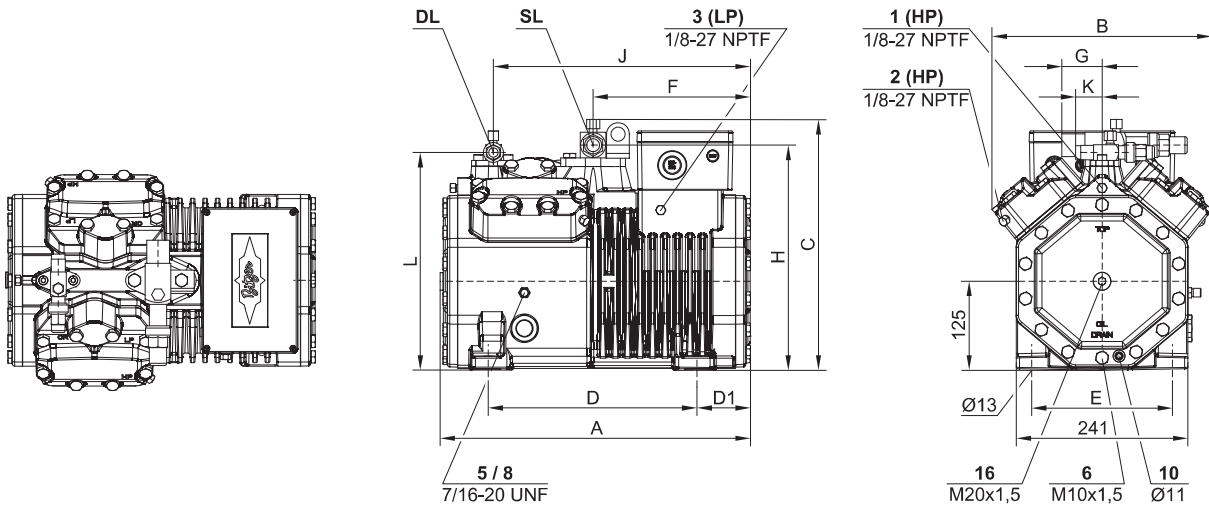
### Compressor model

2DES-3.F1Y

Connection positions see page 29.

## Dimensional drawings

### Housing size 3



#### Compressor models

standard design:

4FES-3(Y), 4FES-5(Y), 4EES-4(Y), 4EES-6(Y), 4DES-5(Y), 4DES-7(Y), 4CES-6(Y), 4CES-9(Y), 4BES-9(Y)

for A3 refrigerants:

4FESP-3Z, 4FESP-5Z, 4EESP-4Z, 4EESP-6Z, 4DESP-5Z, 4DESP-7Z, 4CESP-6Z, 4CESP-9Z and  
4FESP-3P, 4FESP-5P, 4EESP-4P, 4EESP-6P, 4DESP-5P, 4DESP-7P, 4CESP-6P, 4CESP-9P

ECOLINE H:

4FESH-3Y, 4FESH-5Y, 4EESH-4Y, 4EESH-6Y, 4DESH-5Y, 4DESH-7Y, 4CESH-6Y, 4CESH-9Y, 4BESH-9Y

Figure similar with OCTAGON

for R410A and R32:

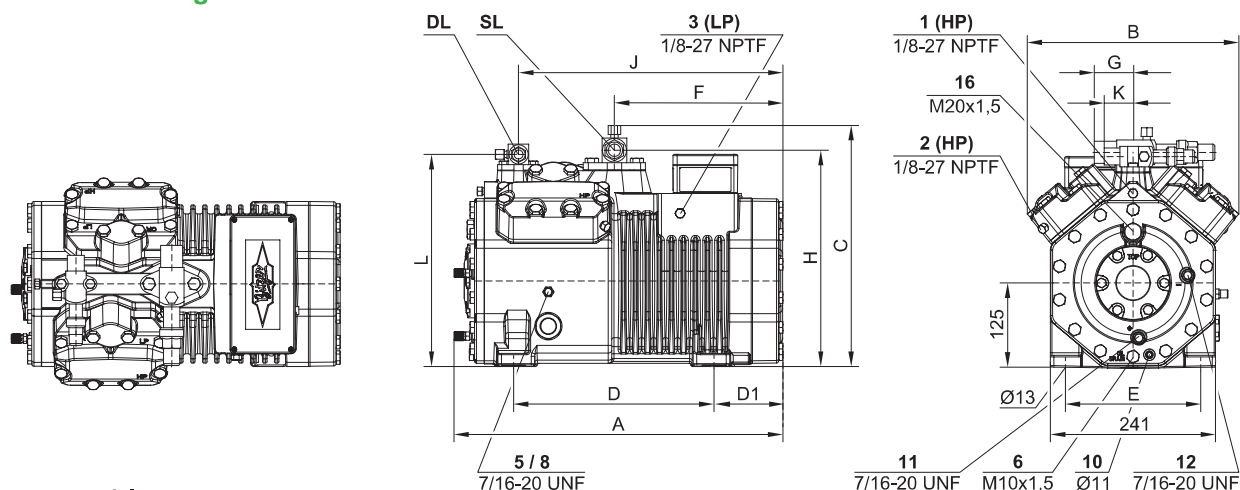
4FDC-5Y, 4EDC-6Y, 4DDC-7Y, 4CDC-9Y

Compressor models	A	B	C	D	D1	E	F	G	H	J	K	L	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
4FES-3(Y), 4FES-5(Y), 4FESP-3Z, 4FESP-5Z, 4FESP-3P, 4FESP-5P, 4FESH-3Y, 4FESH-5Y	436	309	348	293	75	198	221	42	313	361	37	306	16	5/8	22	7/8
4FDC-5Y	464	312	373	293	101	198	247	57	316	387	37	306	16	5/8	22	7/8
4EES-4(Y), 4EES-6(Y), 4EESP-4Z, 4EESP-6Z, 4EESP-4P, 4EESP-6P, 4EESH-4Y, 4EESH-6Y	436	309	352	293	75	198	221	56	316	361	37	306	16	5/8	28	1 1/8
4EDC-6Y	464	312	373	293	101	198	247	57	316	387	37	306	22	7/8	28	1 1/8
4DES-5(Y), 4DESP-5Z, 4DESP-5P, 4DESH-5Y	436	309	352	293	75	198	221	56	316	361	42	310	22	7/8	28	1 1/8
4DES-7(Y), 4CES-6(Y), 4CES-9(Y), 4BES-9(Y), 4DESP-7Z, 4CESP-6Z, 4CESP-9Z, 4DESP-7P, 4CESP-6P, 4CESP-9P, 4DESH-7Y, 4CESH-6Y, 4CESH-9Y, 4BESH-9Y	461	309	352	293	101	198	246	56	316	386	42	310	22	7/8	28	1 1/8
4DDC-7Y	464	312	373	293	101	198	247	57	316	387	42	310	22	7/8	28	1 1/8
4CDC-9Y	497	312	373	293	134	198	280	57	316	420	42	310	22	7/8	28	1 1/8

Connection positions see page 29.



## Dimensional drawings



### Compressor models

special design:

4FE-3(Y), 4FE-5(Y), 4EE-4(Y), 4EE-6(Y), 4DE-5(Y), 4DE-7(Y), 4CE-6(Y), 4CE-9(Y), 4BE-9(Y)

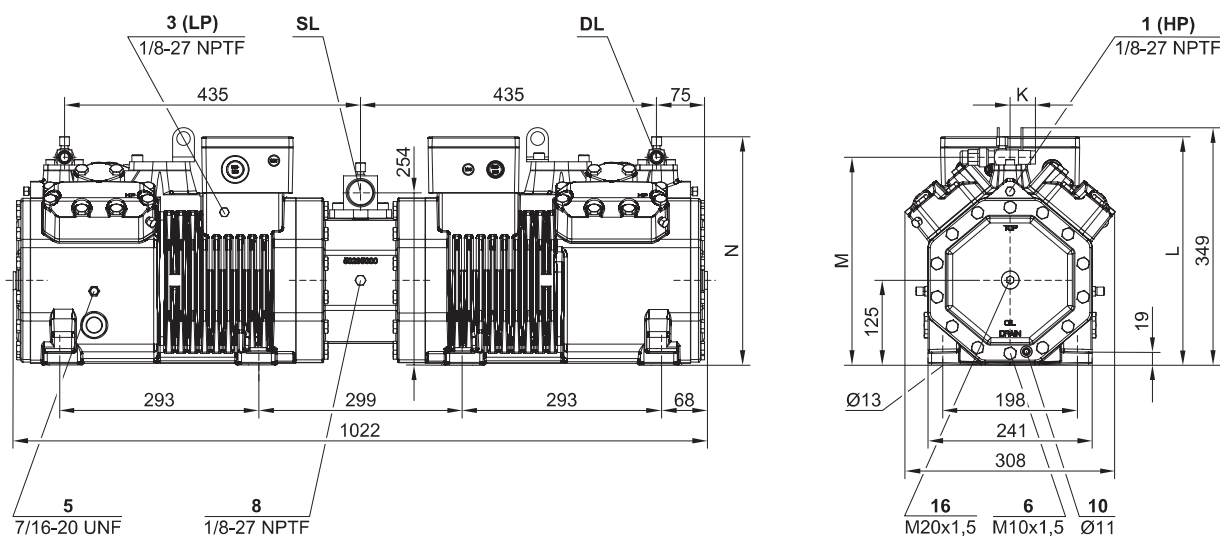
special design for explosion-proof areas:

4FE-3EXY, 4FE-5EXY, 4EE-4EXY, 4EE-6EXY, 4DE-5EXY, 4DE-7EXY, 4CE-6EXY, 4CE-9EXY, 4BE-9EXY, also 4FESP-3EXZ .. 4CESP-9EXZ and 4FESP-3EXP .. 4CESP-9EXP

Figure similar, terminal box is larger.

Compressor models	A	B	C	D	D1	E	F	G	H	J	K	L	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
4FE-3(Y), 4FE-5(Y)	458	309	348	293	75	198	221	42	313	361	37	306	16	5/8	22	7/8
4EE-4(Y), 4EE-6(Y)	458	309	352	293	75	198	221	56	316	361	37	306	16	5/8	28	1 1/8
4DE-5(Y)	458	309	352	293	75	198	221	56	316	361	42	310	22	7/8	28	1 1/8
4DE-7(Y), 4CE-6(Y), 4CE-9(Y), 4BE-9(Y)	483	309	352	293	101	198	246	56	316	386	42	310	22	7/8	28	1 1/8

### Tandem



### Compressor models

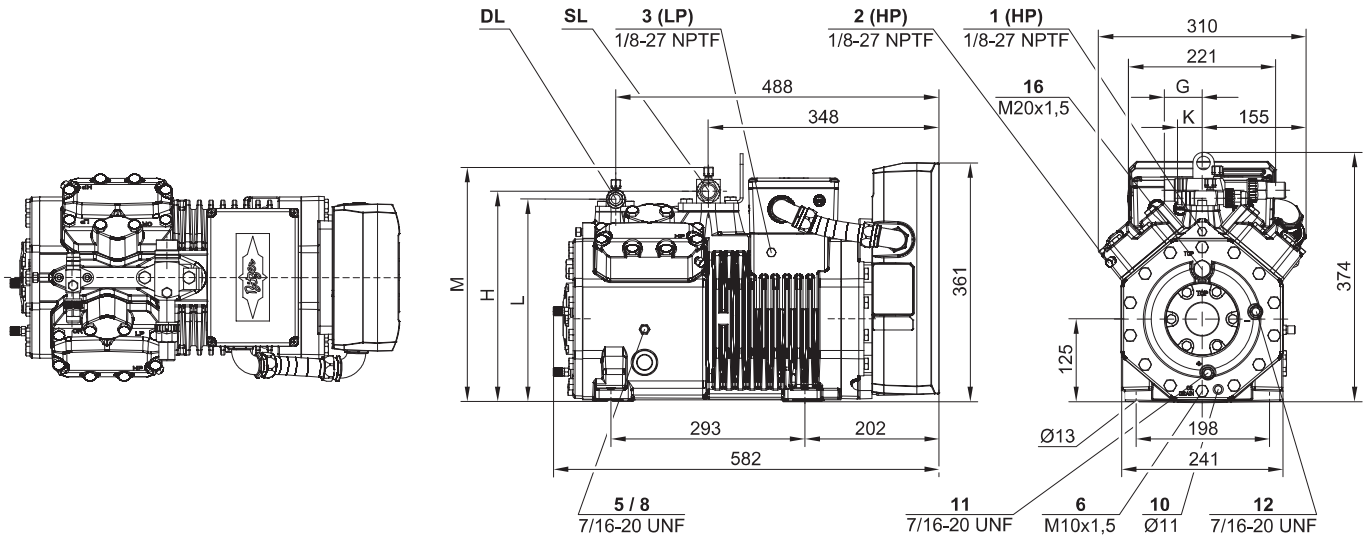
44FES-6(Y), 44FES-10(Y), 44EES-8(Y), 44EES-12(Y), 44DES-10(Y), 44DES-14(Y), 44CES-12(Y), 44CES-18(Y)

Compressor models	K	L	M	DL	DL	SL	SL
	mm	mm	mm	mm	inch	mm	inch
44FES-6(Y), 44FES-10(Y), 44EES-8(Y), 44EES-12(Y)	37	336	306	2x16	2x5/8	35	1 3/8
44DES-10(Y), 44DES-14(Y), 44CES-12(Y), 44CES-18(Y)	42	336	310	2x22	2x7/8	35	1 3/8

Connection positions see page 29.

## Dimensional drawings

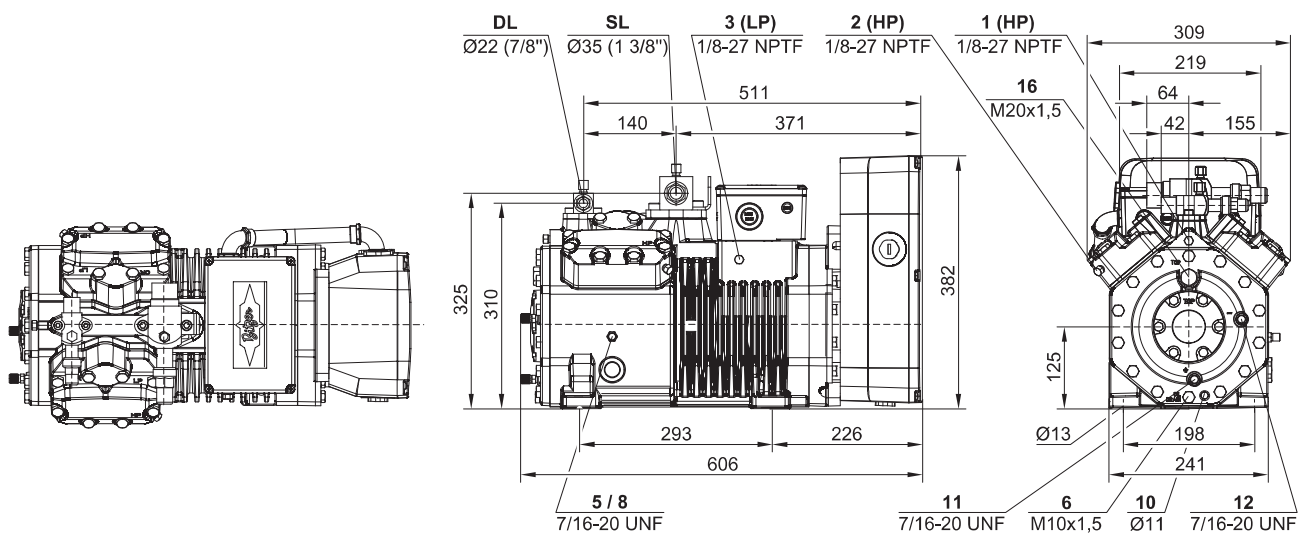
### VARISPEED



#### Compressor models

4FE-5.F1Y, 4EE-6.F1Y, 4DE-5.F1Y, 4CE-6.F1Y

Compressor models	G	H	K	L	M	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	inch	mm	inch
4FE-5.F1Y, 4EE-6.F1Y	56	317	37	306	353	16	5/8	28	1 1/8
4DE-5.F1Y, 4CE-6.F1Y	64	325	42	310	369	22	7/8	35	1 3/8



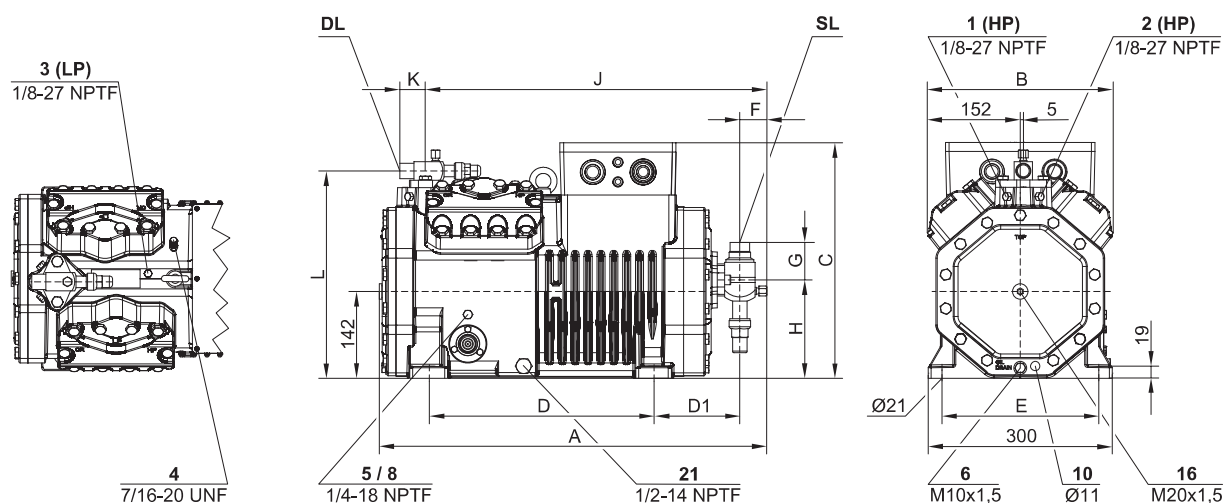
#### Compressor models

4DE-7.F3Y, 4CE-9.F3Y

Connection positions see page 29.

## Dimensional drawings

### Housing size 4



### Compressor models

standard design:

4VES-7(Y), 4VES-10(Y), 4TES-9(Y), 4TES-12(Y), 4PES-12(Y), 4PES-15(Y), 4NES-14(Y), 4NES-20(Y)

for A3 refrigerants:

4VESP-7Z, 4VESP-10Z, 4TESP-9Z, 4TESP-12Z, 4PESP-12Z, 4PESP-15Z, 4NESP-14Z, 4NESP-20Z and 4VESP-7P, 4VESP-10P, 4TESP-9P, 4TESP-12P, 4PESP-12P, 4PESP-15P, 4NESP-14P, 4NESP-20P

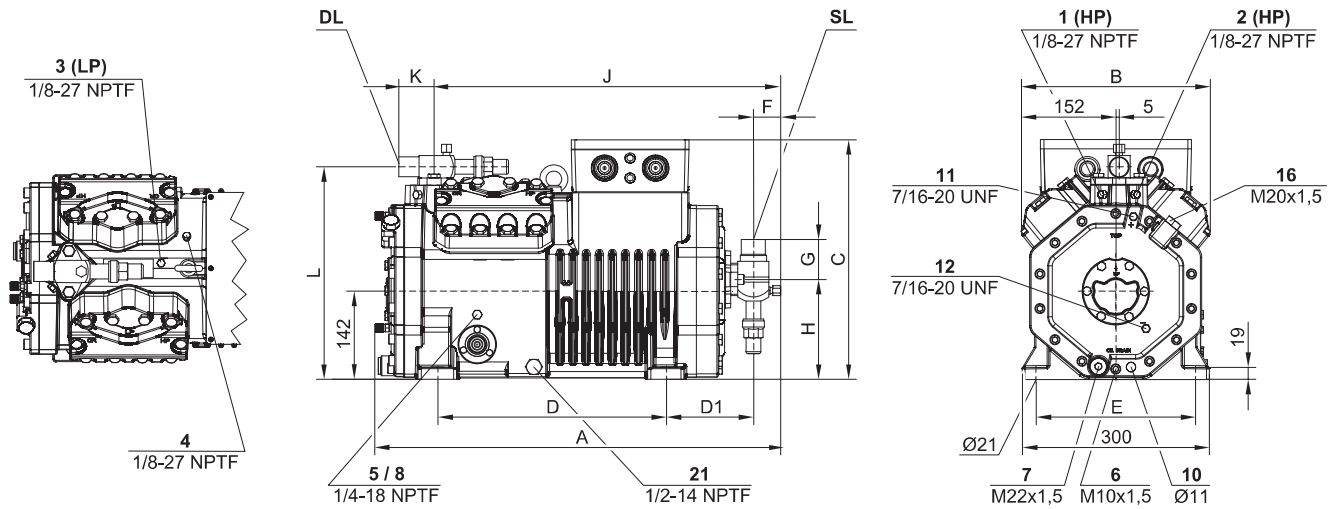
Figure similar with OCTAGON for R410A and R32:

4VDC-10Y, 4TDC-12Y, 4PDC-15Y, 4NDC-20Y

Compressor models	A	B	C	D	D1	E	F	G	H	J	K	L	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
4VES-7(Y), 4VES-10(Y), 4VESP-7Z, 4VESP-10Z, 4VESP-7P, 4VESP-10P	634	303	385	367	142	256	44	62	160	558	42	339	22	7/8	28	1 1/8
4VDC-10Y	619	304	385	367	170	256	18	56	173	526	42	339	22	7/8	28	1 1/8
4TES-9(Y), 4TES-12(Y), 4TESP-9Z, 4TESP-12Z, 4TESP-9P, 4TESP-12Z	634	303	385	367	142	256	44	64	161	558	56	342	28	1 1/8	35	1 3/8
4TDC-12Y	619	304	385	367	170	256	25	64	173	533	56	342	28	1 1/8	35	1 3/8
4PES-12(Y), 4PES)-12Z, 4PESP-12P	634	303	385	367	142	256	44	64	161	558	56	342	28	1 1/8	35	1 3/8
4PES-15(Y), PES-15Z, PESP-15Z	658	303	385	367	162	256	48	112	173	582	56	342	28	1 1/8	42	1 5/8
4PDC-15Y, 4NDC-20Y	633	304	385	367	184	256	62	112	346	495	56	342	28	1 1/8	35	1 3/8
4NES-14(Y), 4NESP-14Z, 4NESP-14P	634	303	385	367	142	256	44	64	161	558	56	342	28	1 1/8	35	1 3/8
4NES-20(Y), 4NESP-20Z, 4NESP-20P	658	303	385	367	162	256	48	112	173	582	56	342	28	1 1/8	42	1 5/8

Connection positions see page 29.

## Dimensional drawings



### Compressor models

ECOLINE H:

special design:

special design for explosion-proof areas:

4VEH-7Y, 4VEH-10Y, 4TEH-9Y, 4TEH-12Y, 4PEH-12Y, 4PEH-15Y, 4NEH-14Y, 4NEH-20Y

4VE-7(Y), 4VE-10(Y), 4TE-9(Y), 4TE-12(Y), 4PE-12(Y), 4PE-15(Y), 4NE-14(Y), 4NE-20(Y)

4VE-7EXY, 4VE-10EXY, 4TE-9EXY, 4TE-12EXY, 4PE-12EXY, 4PE-15EXY, 4NE-14EXY,

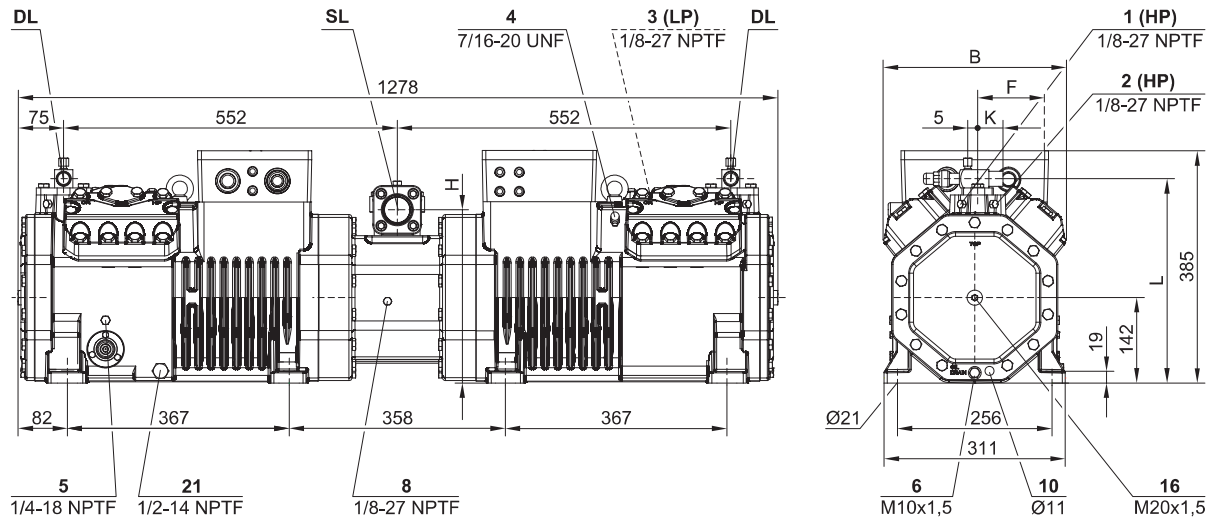
4NE-20EXY, also 4VESP-7EXZ .. 4NESP-20EXZ and 4VESP-7EXP .. 4NESP-20EXP

Figure similar, terminal box is larger.

Compressor models	A	B	C	D	D1	E	F	G	H	J	K	L	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
44VEH-7Y, 4VEH-10Y, 4VE-7(Y), 4VE-10(Y)	653	303	385	367	142	256	44	61	161	558	42	339	22	7/8	28	1 1/8
4TEH-9Y, 4TEH-12Y, 4TE-9(Y), 4TE-12(Y)	653	303	385	367	142	256	44	64	160	558	56	342	28	1 1/8	35	1 3/8
4PEH-12Y, 4PE-12(Y)	653	303	385	367	142	256	44	64	160	558	56	342	28	1 1/8	35	1 3/8
4PESH15Y, 4PE-15(Y)	677	303	385	367	209	256	48	112	173	582	56	342	28	1 1/8	42	1 5/8
4NEH-14Y, 4NE-14(Y)	653	303	385	367	142	256	44	64	160	558	56	342	28	1 1/8	35	1 3/8
4NEH-20Y, 4NE-20(Y)	677	303	385	209	162	256	48	112	173	582	56	342	28	1 1/8	42	1 5/8

## Dimensional drawings

### Tandem

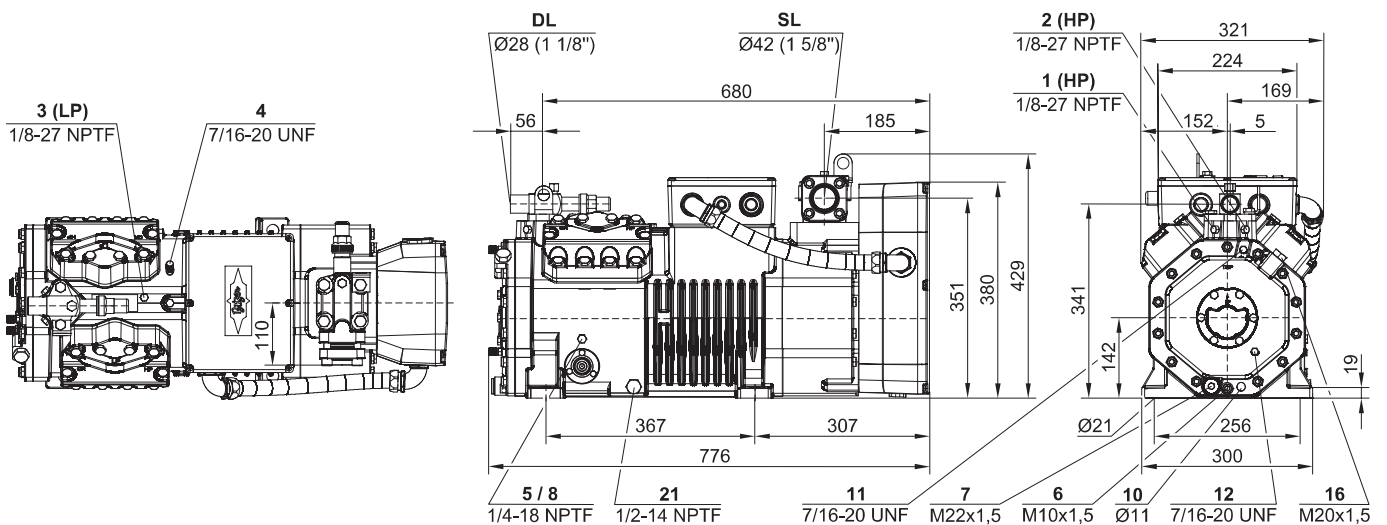


### Compressor models

44VES-14(Y), 44VES-20(Y), 44TES-18(Y), 44TES-24(Y), 44PES-24(Y), 44PES-30(Y), 44NES-28(Y), 44NES-40(Y)

Compressor models	B mm	F mm	H mm	K mm	L mm	DL mm	DL inch	SL mm	SL inch
44VES-14(Y), 44VES-20(Y)	303	110	287	42	338	2x22	2x7/8	42	1 5/8
44TES-18(Y), 44TES-24(Y), 44PES-24(Y), 44PES-30(Y), 44NES-28(Y), 44NES-40(Y)	330	127	302	56	342	2x28	2x1 1/8	54	2 1/8

### VARISPEED



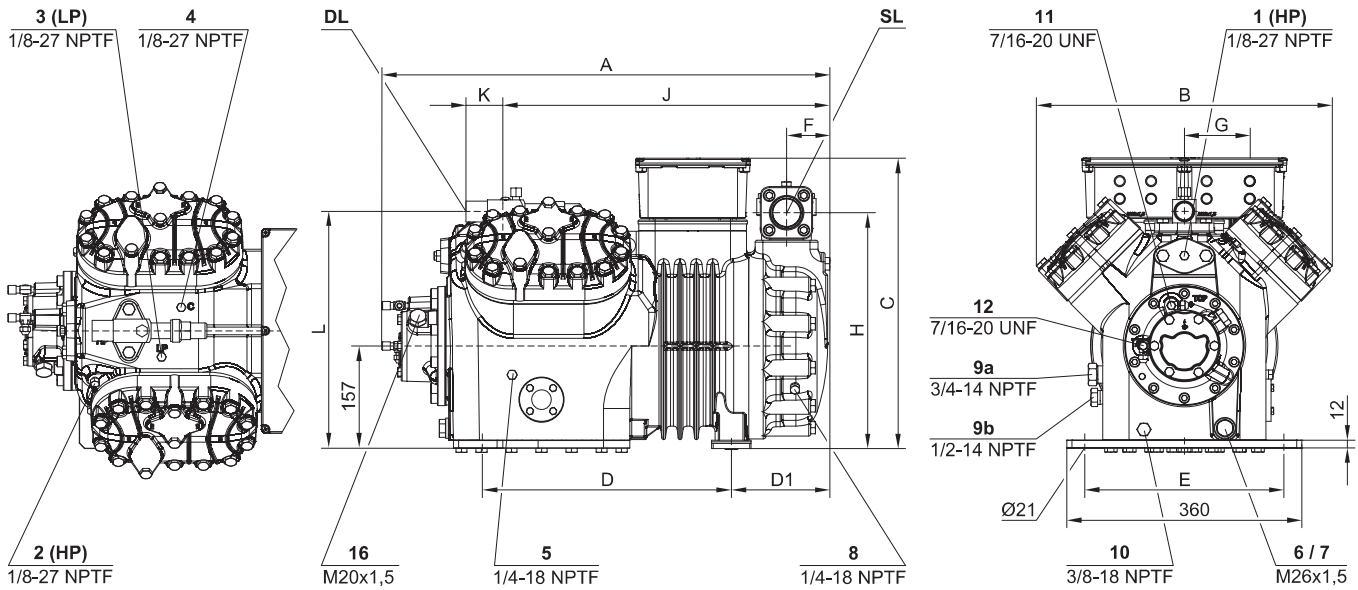
### Compressor models

4VE-7.F3Y, 4VE-10.F4Y, 4TE-9.F3Y, 4TE-12.F4Y, 4PE-12.F3Y, 4PE-15.F4Y, 4NE-14.F3Y, 4NE-20.F4Y

Connection positions see page 29.

## Dimensional drawings

### Housing size 5



### Compressor models

Standard design:

for A3 refrigerants:

4JE-15(Y), 4JE-22(Y), 4HE-18(Y), 4HE-25(Y), 4GE-23(Y), 4GE-30(Y), 4FE-28(Y), 4FE-35(Y)  
 4JEP-15Z, 4JEP-22Z, 4HEP-18Z, 4HEP-25Z, 4GEP-23Z, 4GEP-30Z, 4FEP-28Z, 4FEP-35Z and  
 4JEP-15P, 4JEP-22P, 4HEP-18P, 4HEP-25P, 4GEP-23P, 4GEP-30P, 4FEP-28P, 4FEP-35P

ECOLINE H:

4JEH-15Y, 4JEH-22Y, 4HEH-18Y, 4HEH-25Y, 4GEH-23Y, 4GEH-30Y, 4FEH-28Y, 4FEH-35Y

special design for explosion-proof areas:

4JE-15EXY, 4JE-22EXY, 4HE-18EXY, 4HE-25EXY, 4GE-23EXY, 4GE-30EXY, 4FE-28EXY,  
 4FE-35EXY, also 4JEP-15EXZ .. 4FEP-35EXZ and 4JEP-15EXP .. 4FEP-35EXP

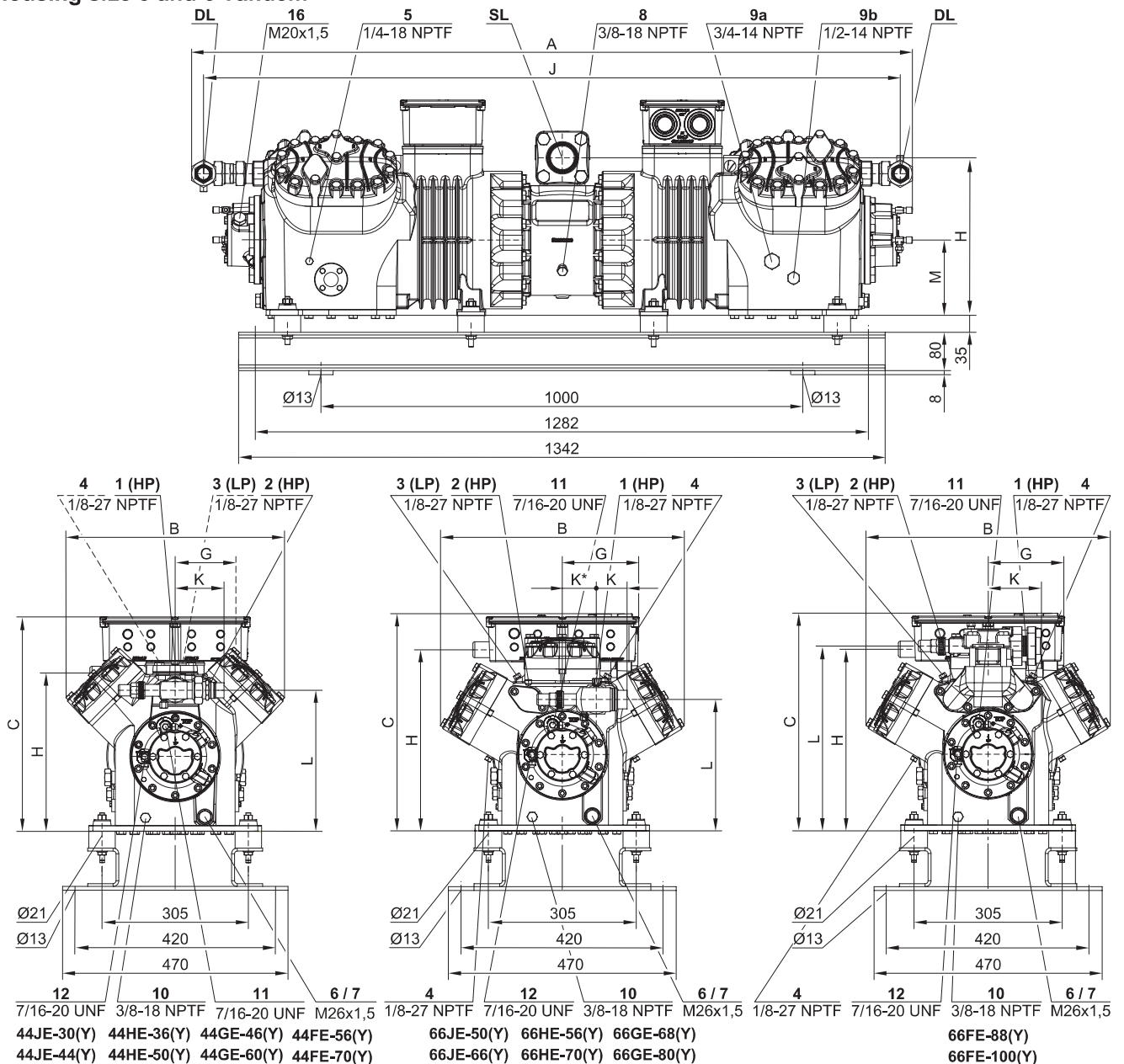
Figure similar, terminal box is larger.

Compressor models	A	B	C	D	D1	E	F	G	H	J	K	L	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
4JE-15(Y), 4JE-22(Y), 4JEP-15Z, 4JEP-22Z, 4JEP-15P, 4JEP-22P, 4JEH-15Y, 4JEH-22Y	686	453	445	381	151	305	66	110	361	501	56	362	28	1 1/8	42	1 5/8
4HE-18(Y), 4HEP-18Z, 4HEP-18P, 4HEH-18Y	686	453	445	381	151	305	66	110	361	501	56	362	28	1 1/8	42	1 5/8
4HE-25(Y), 4HEP-25Z, 4HEP-25P, 4HEH-25Y	735	453	445	381	200	305	87	127	377	549	56	362	28	1 1/8	54	2 1/8
4GE-23(Y), 4GEP-23Z, 4GEP-23P, 4GEH-23Y	704	453	445	381	169	305	76	127	377	519	56	362	28	1 1/8	54	2 1/8
4GE-30(Y), 4GEP-30Z, 4GEP-30P, 4GEH-30Y	735	453	445	381	200	305	87	127	377	549	56	362	28	1 1/8	54	2 1/8
4FE-28(Y), 4FE-35(Y), 4FEP-28Z, 4FEP-35Z, 4FEP-28P, 4FEP-35P, 4FEH-28Y, 4FEH-35Y	735	453	445	381	200	305	87	127	377	549	56	362	28	1 1/8	54	2 1/8

Connection positions see page 29.

## Dimensional drawings

### Housing size 5 and 6 Tandem



#### Compressor models

housing size 5: 44JE-30(Y), 44JE-44(Y), 44HE-36(Y), 44HE-50(Y), 44GE-46(Y), 44GE-60(Y), 44FE-56(Y), 44FE-70(Y)

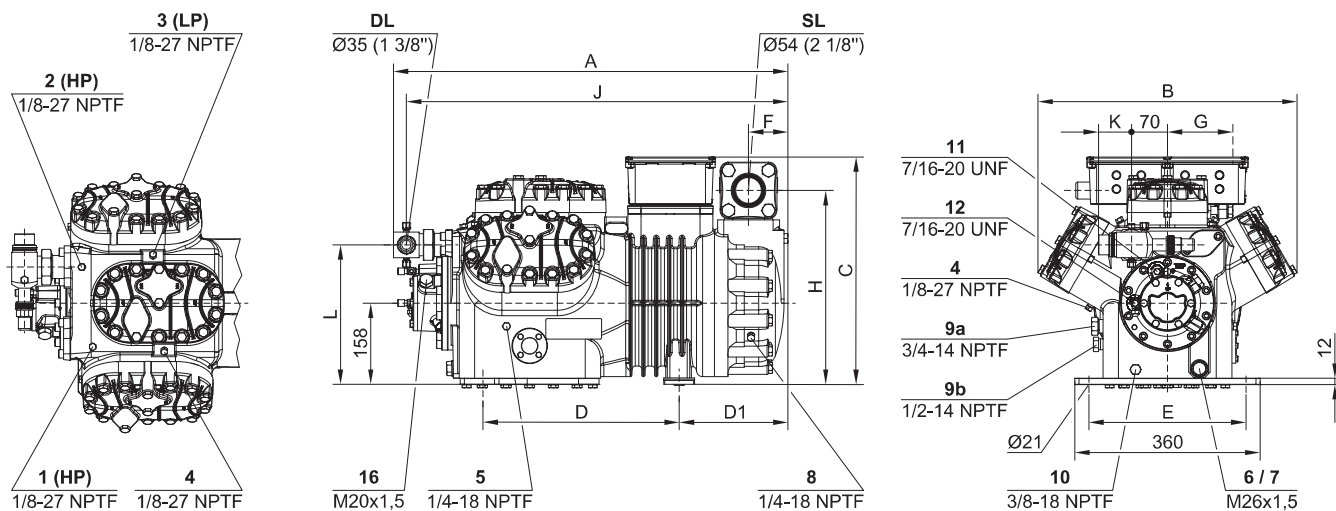
housing size 6: 66JE-50(Y), 66JE-66(Y), 66HE-56(Y), 66HE-70(Y), 66GE-68(Y), 66GE-80(Y), 66FE-88(Y), 66FE-100(Y)

Compressor models	A	B	C	G	H	J	K	K*	L	M	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
44JE-30(Y)	1496	453	444	127	328	1446	101	-	294	156	2x28	2x1 1/8	54	2 1/8
44JE-44(Y)	1553	453	444	158	372	1503	101	-	294	156	2x28	2x1 1/8	76	3 1/8
44HE-36(Y)	1496	453	444	127	328	1446	101	-	294	156	2x28	2x1 1/8	54	2 1/8
44HE-50(Y)	1553	453	444	158	372	1503	101	-	294	156	2x28	2x1 1/8	76	3 1/8
44GE-46(Y), 44GE-60(Y), 44FE-56(Y), 44FE-70(Y)	1553	453	444	158	372	1503	101	-	294	156	2x28	2x1 1/8	76	3 1/8
66JE-50(Y), 66JE-66(Y), 66HE-56(Y), 66HE-70(Y), 66GE-68(Y), 66GE-80(Y)	1664	503	447	158	374	1614	64	70	271	158	2x35	2x1 3/8	76	3 1/8
66FE-88(Y), 66FE-100(Y)	1616	503	447	158	374	1496	111	-	381	158	2x42	2x1 5/8	76	3 1/8

Connection positions see page 29.

## Dimensional drawings

### Housing size 6



### Compressor models

standard design:

6JE-25(Y), 6JE-33(Y), 6HE-28(Y), 6HE-35(Y), 6GE-34(Y), 6GE-40(Y)

for A3 refrigerants:

6JEP-25Z, 6JEP-33Z, 6HEP-28Z, 6HEP-35Z, 6GEP-34Z, 6GEP-40Z and 6JEP-25P, 6JEP-33P, 6HEP-28P, 6HEP-35P, 6GEP-34P, 6GEP-40P

ECOLINE H:

6JEH-25Y, 6JEH-33Y, 6HEH-28Y, 6HEH-35Y, 6GEH-34Y, 6GEH-40Y

special design for explosion-proof areas: 6JE-25EXY, 6JE-33EXY, 6HE-28EXY, 6HE-35EXY, 6GE-34EXY, 6GE-40EXY also

6JEP-25EXZ ..6GEP-40EXZ and 6JEP-25EXP .. 6GEP-50EXP

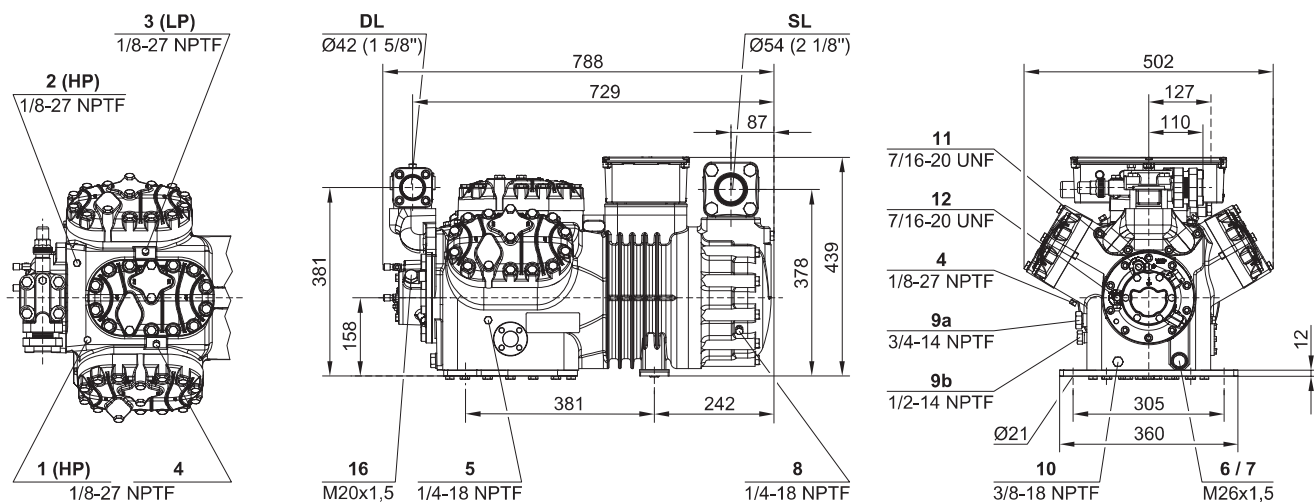
Figure similar, terminal box is larger.

Compressor models	A	B	C	D	D1	E	F	G	H	J	K	L	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
6JE-25(Y), 6JEP-25Z, 6JEP-25P, 6JEH-25Y	765	502	439	381	211	305	76	127	378	740	64	271	35	1 3/8	54	2 1/8
6JE-33(Y), 6JEP-33Z, 6JEP-33P, 6JEH-33Y	796	502	439	381	242	305	87	127	378	771	64	271	35	1 3/8	54	2 1/8
6HE-28(Y), 6HEP-28Z, 6HEP-28P, 6HEH-28Y	765	502	439	381	211	305	76	127	378	740	64	271	35	1 3/8	54	2 1/8
6HE-35(Y), 6HEP-35Z, 6HEP-35P, 6HEH-35Y	796	502	439	381	242	305	87	127	378	771	64	271	35	1 3/8	54	2 1/8
6GE-34(Y), 6GEP-34Z, 6GEP-34P, 6GEH-34Y	765	502	439	381	211	305	76	127	378	740	64	271	35	1 3/8	54	2 1/8
6GE-40(Y), 6GEP-40Z, 6GEP-40P, 6GEH-40Y	796	502	439	381	242	305	87	127	378	771	64	271	35	1 3/8	54	2 1/8

Connection positions see page 29.



## Dimensional drawings



### Compressor models

standard design:

6FE-44(Y), 6FE-50(Y)

for A3 refrigerants::

6FEP-44Z, 6FEP-50Z and 6FEP-44P, 6FEP-50P

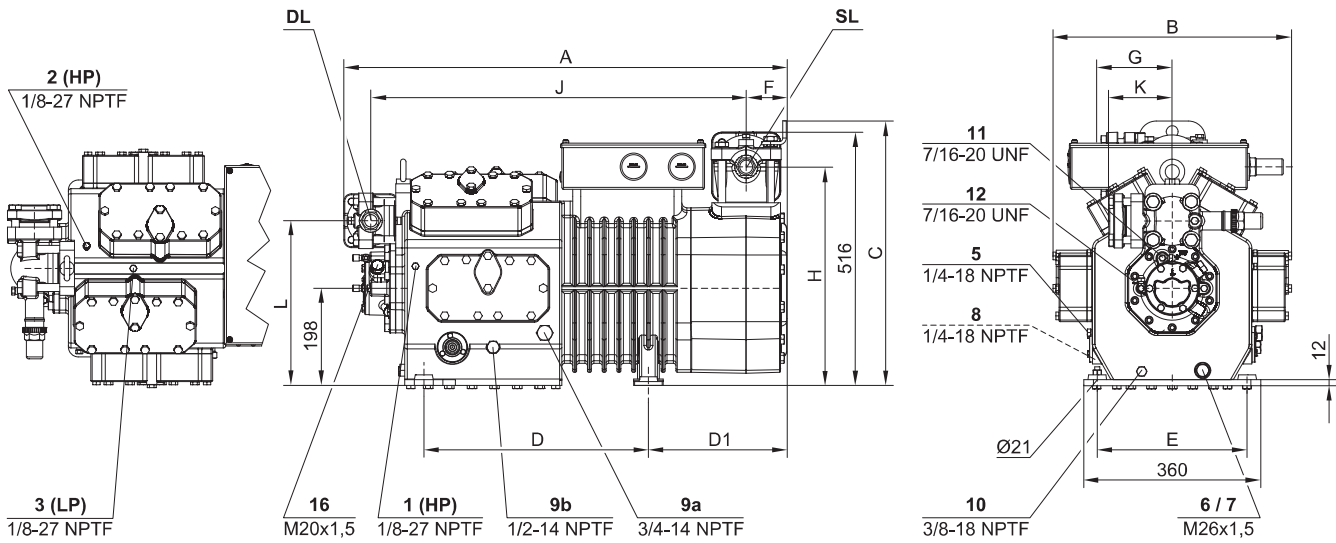
ECOLINE H:

6FEH-44Y, 6FEH-50Y

special design for explosion-proof areas: 6FE-44EXY, 6FE-50EXY, also 6FEP-44EXZ, 6FEP-50EXZ and 6FEP-44EXP, 6FEP-50EXP  
Figure similar, terminal box is larger.

## Dimensional drawings

### Housing size 8



### Compressor models

standard design:

8GE-50(Y), 8GE-60(Y), 8FE-60(Y), 8FE-70(Y)

for A3 refrigerants:

8GEP-50Z, 8GEP-60Z, 8FEP-60Z, 8FEP-70Z and 8GEP-50P, 8GEP-60P, 8FEP-60P, 8FEP-70P

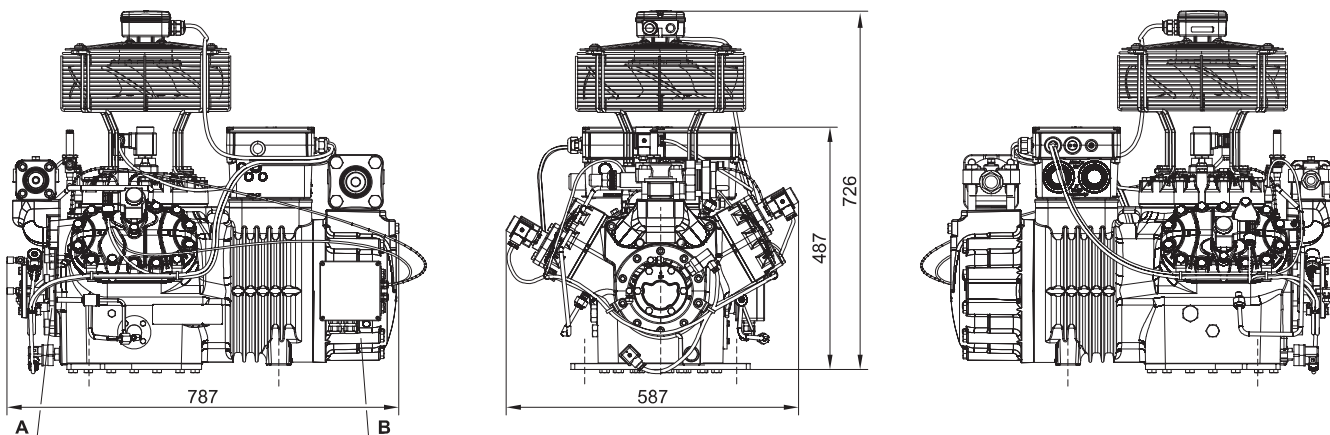
special design for explosion-proof areas: 8GE-50EXY, 8GE-60EXY, 8FE-60EXY, 8FE-70EXY, also 8GEP-50EXZ .. 8FEP-70EXZ and 8GEP-50EXP .. 8FEP-70EXP

Figure similar, terminal box is larger.

Compressor models	A	B	C	D	D1	E	F	G	H	J	K	L	DL	DL	SL	SL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	inch	mm	inch
8GE-50(Y), 8GE-60(Y), 8GEP-50Z, 8GEP-60Z, 8GEP-50P, 8GEP-60P	886	485	538	457	281	305	82	158	444	757	110	306	42	1 5/8	76	3 1/8
8FE-60(Y), 8FE-70(Y), 8FEP-60Z, 8FEP-70Z, 8FEP-60P, 8FEP-70P	902	485	538	457	281	305	82	158	444	764	129	306	54	2 1/8	76	3 1/8

Connection positions see page 29.

### Dimensional drawing with accessories



Example: fully equipped 6FE-50Y

A: Bearing cover end

B: Motor cover end

By installing some accessories the outer contour of the compressor becomes larger. The table lists the additional space required in millimetres, although the installation tolerance may exceed one millimetre. Therefore, the dimensions are rounded up, they refer to the compressor housing at the mounting position.

The fans are much higher, the values given indicate the increase in the total height of the compressor, whereby the fan guard also protrudes on one or more sides depending on the size of the housing. The alternatively available fans for single phase AC on the housing sizes 5 and 6 are additionally about 30 mm higher.

Housing size	1	2	3	4	5	6	8
Oil heater	20	20	20	20	55	55	55
Solenoid valves on cylinder heads			85	85	85	85	85
opto-electronical oil level monitoring		65	65	65			
Oil pressure monitoring (Delta-PII)				95	95	95	95
IQ MODULE (CM-RC-01)			55	45	45	45	0
OLM-AS			110	110	110	110	
Additional fan	205	195	205	190	235	260	



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Subject to change // 80105001 // 09.2020