DAS HERZ DER FRISCHE

SEMI-HERMETIC

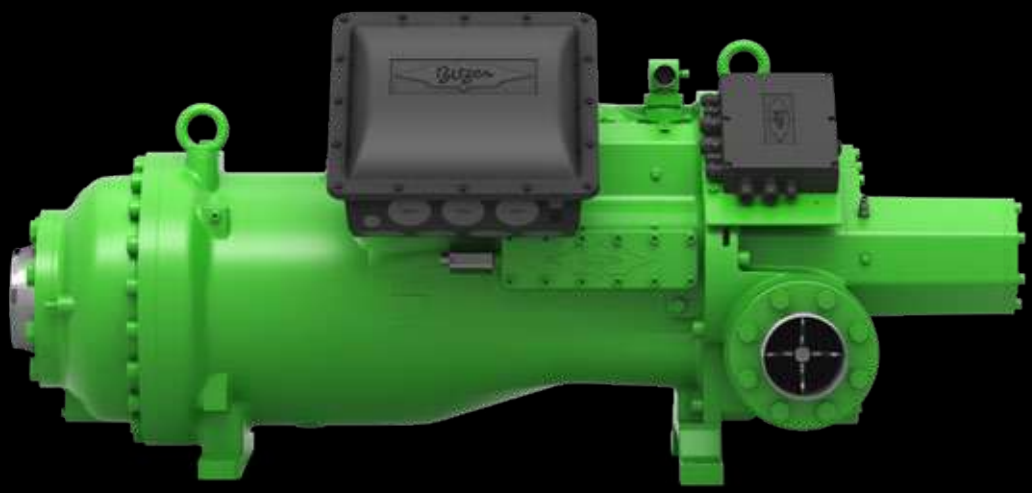
SCREW COMPRESSORS

50 Hz // SP-100-6 EN

HS.53 // HS.64 // HS.74 // HS.85 // HS.95



WITH IQ MODUL



COMMERCIAL REFRIGERATION

INDUSTRIAL REFRIGERATION

MARINE

BITZER Innovation Targets

Products for refrigerants with low greenhouse warming potential (GWP)

// For naturally appearing substances

// For new refrigerants like 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 screw compressors

HS. series

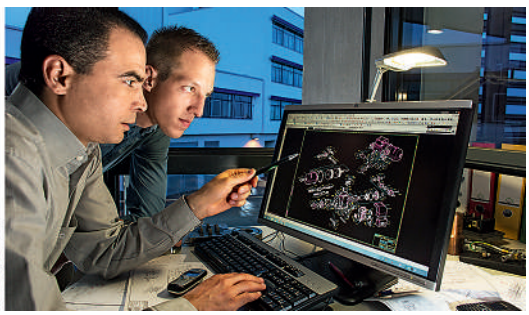
Displacements from 84 to 1015 m³/h at 50 Hz
with parallel compounding up to 4060 m³/h

Contents Page

The HSK and HSN screw compressors	3
The capacity range	3
Capacity control and V_i depending on construction size	4
Equipment and accessories	4
Booster	5
Oil management	6
Refrigeration compressor oils	7
Intelligent compressor protection and electronic oil monitoring	8
IQ MODUL CM-SW-01 for HS.95	9
BEST SOFTWARE	9
VARIPACK – External BITZER Frequency Inverters	10
New refrigerants with low warming potential	11
Application limits	12
Performance data	
BITZER SOFTWARE	15
ASERCOM certified performance data	15
Technical Data	16
Dimensional drawings	18

The semi-hermetic screw compressors of the HS. series are very versatile: they are suitable for low temperature refrigeration, for medium temperature application, for air conditioning and for heat pumps in commercial and industrial systems and in marine applications. They have been developed both for single compressor systems and for use in parallel compounding.

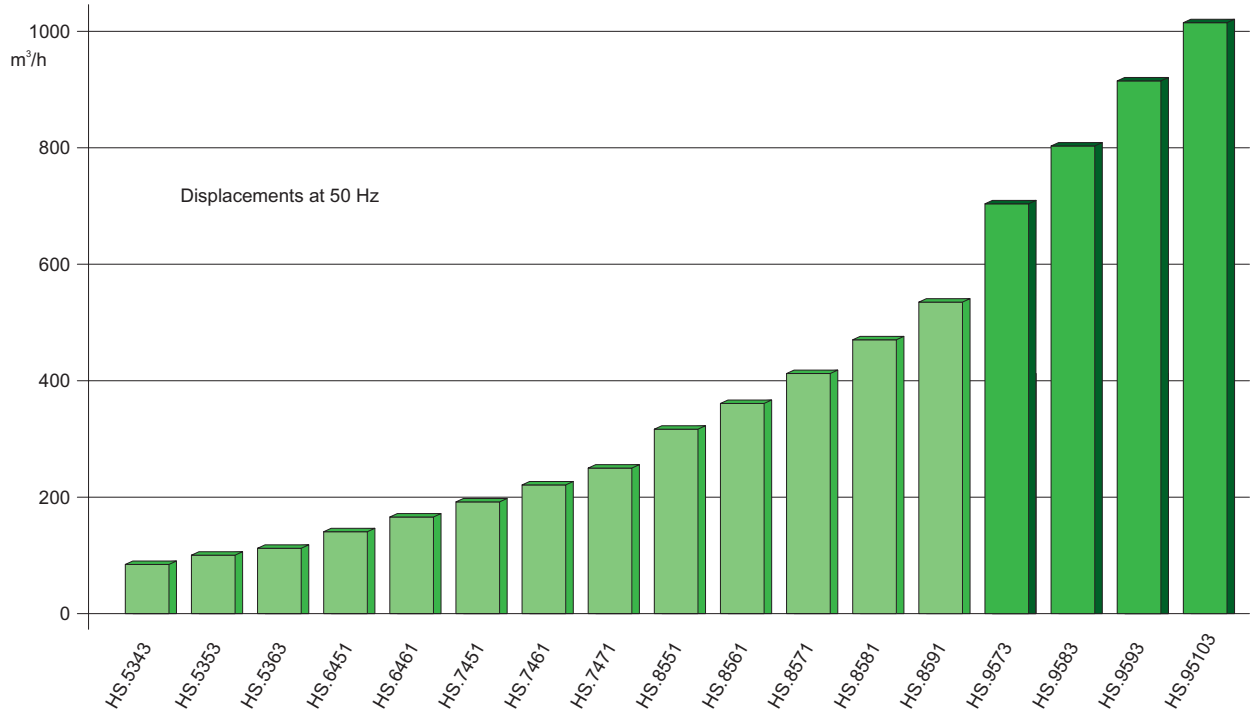




The HSK and HSN screw compressors

They set the worldwide standard for technological innovation, versatility and efficiency.

The capacity range



The special highlights

// Energy efficient
- high-efficiency profile
- high motor efficiency
- efficient capacity control
- economiser operation (ECO)

// Universal
- R1234yf, R134a, R404A, R507A, R407A, R407C, R407F, R407H, R448A, R449A, R450A, R452A, R454C, R455A, R513A
- special design for R290 and R1270
- other refrigerants upon request
- with and without Economiser (ECO)

// Robust design
- generously dimensioned bearings
- large volume motor
- automatic start unloading

// Low sound and low vibration
- steady discharge characteristics
- only rotating masses

// Capacity control
- particularly suitable for operation with frequency inverter (FI)
  core range 20 .. 60 Hz possible with any HS. compressor and matching FI
- mechanical capacity control
  stepped for HS.53 to HS.74
  stepless for HS.85 and HS.95

Versatile due to parallel compounding

// High system performance
- in parallel compounding up to 4060 m³/h at 50 Hz with four HS.95103

// Optimum capacity adjustment and lowest power consumption at full and part load
- combination of different compressor sizes possible
- part load by simply switching off compressor
- fine gradation by additional compressor capacity control or by operating a compressor with FI

Booster for compound systems

// for 2-stage compressor compound

// for low temperature cooling down to -50°C evaporation temperature

Versatile in use

// in commercial refrigeration systems

// in industrial refrigeration systems

// in marine applications

Capacity control and V_i depending on construction size

Capacity control

// HS.53 to HS.74: Multi-stage capacity control
- efficient capacity control by shifting of the suction port in two steps (75 and 50%)
- hydraulically operated control pistons – at full load operation absolutely form-fit
- both protection against liquid slugging and strong over-compression
- simple control via flanged solenoid valves

// HS.85: Dual capacity control
- infinite or 3-stage slider control with V_i-compensation (for lower pressure ratios also 4-stage) Alternative operating mode by varying control sequence only – no need for compressor modification
- easy control by flanged-on solenoid valves

// HS.95: Stepless capacity control
- efficient stepless capacity and V_i control due to an optimised slider concept
- automatic V_i control
- high efficiency in wide application limits
- intelligent compressor monitoring module with extended protection concept and slider control

Automatic start unloading

Adjusted discharge ports

// HSK models for air-conditioning and medium temperature applications

// HSN models for low temperature application

// HS.53 to HS.74: high efficiency over a wide application range due to the Duo-Port system: special port contour with additional radial outlet

// HS.85: V_i adaption by capacity control slider

// HS.95: automatic V_i control

Equipment and accessories

Complete equipment

// Capacity control

// Start unloading

// Suction gas connection: flange with brazing and welding bush, for HS.53 to HS.74: suction gas shut-off valve

// Discharge gas connection: flange with brazing and welding bush

// Check valve in the discharge gas chamber

// Integrated pressure relief valve according to EN12693 and UL60335-2-34

// Electronic compressor protection device

// Vibration dampers for HS.53, HS.64, HS.74

// Kit for oil injection

Comprehensive range of accessories

// Shut-off valves up to DN125
- Discharge gas shut-off valve
- Suction gas shut-off valve

// ECO shut-off valve, depending on size with pulsation muffler

// Connection adapter for liquid injection (LI), depending on size with integrated injection nozzle

// Oil injection valve for every size

// Vibration dampers for HS.85 and HS.95

// Compressor protection devices with extended functions for HS.53 to HS.85

// Heating element for the terminal box of HS.64 and HS.74

// Oil separators of various capacity sizes with
- oil heaters in pre-mounted heater sleeves
- oil thermostat in pre-mounted heating sleeve
- oil level switch

// Air cooled oil coolers

// Water cooled oil coolers

// Thermosiphon oil cooling depending on system design upon request

Accessories for parallel compounding of up to 6 compressors

// HS.53 to HS.85 up to 6 compressors

// HS.95 up to 4 compressors

// Selection and technical data see BITZER SOFTWARE.

Other technical features

Optimised emergency running characteristics

// Rotors with roller bearings on both sides
  – radial and axial
// Generously sized oil supply reservoir
// Check valve in the discharge chamber as protection against reverse running at standstill
// Integrated pressure relief valve

Economiser operation (ECO)

// Increased capacity and efficiency at medium and high pressure ratios
// Close to ideal compression
// Significant increase in capacity density and system efficiency

Booster

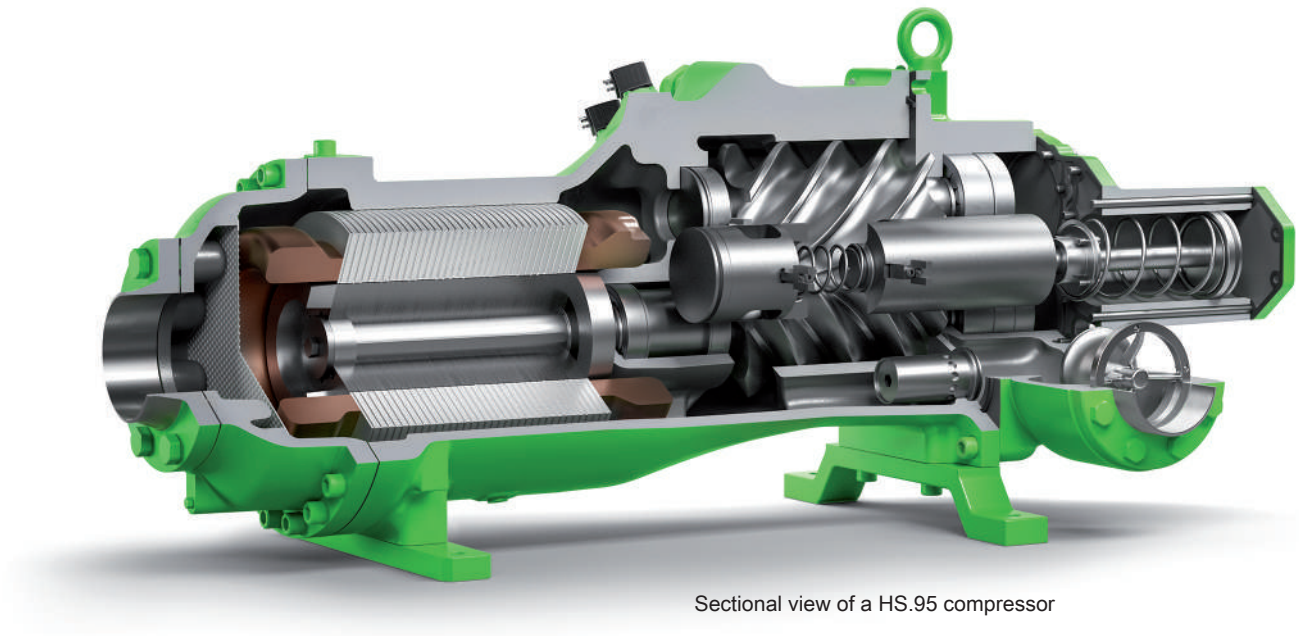
These compressors are used in 2-stage compound systems in the lower temperature range, which is characterised by a relatively low pressure difference. Boosters are approved for operation below ambient pressure. The refrigerant selection is therefore limited to the non-flammable A1 refrigerants: R404A, R507A, R407A, R407C, R407F, R407H, R448A, R449A and R452A.

HSKB53 to HSKB85

// special compressor design
// code "B" in model designation
// design adapted to the booster pressure ratios
// motor 3
selected to match the drive load

HSK95

All compressors of this series with motor 2 can be operated as boosters. This is made possible by the automatic adjustment of the V_i sliders.

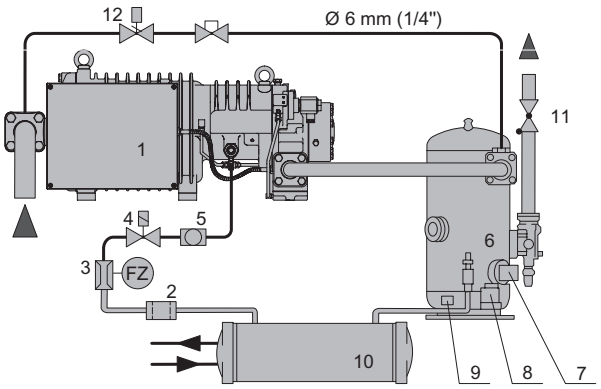


Sectional view of a HS.95 compressor

Oil management

// complete accessories for oil injection
// simple parallel compounding
// no oil pump required
// Booster
– solenoid oil valve in oil line mandatory
– external oil pump may be necessary

HS.53, HS.64 and HS.74

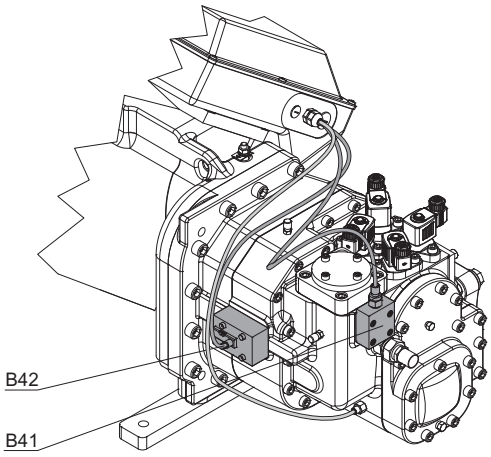


1	Compressor	**2**	Oil filter
3	Oil flow switch	**4**	Solenoid oil valve
5	Sight glass	**6**	Oil separator
7	Oil level switch	**8**	Oil thermostat
9	Oil heater	**10**	Oil cooler, only if required
11	Check valve	**12**	Solenoid valve as standstill bypass, only when required

Accessories for the oil injection line, included in the scope of delivery:

// Oil filter
// Oil flow switch
// Electronic oil monitoring
// Solenoid oil valve
// Oil sight glass

HS.85



B41	Oil filter monitoring
B42	Oil supply monitoring

Oil management system integrated in the compressor, only a few components are required in the oil line, which are included in the scope of delivery:

// Shut-off valve
// Oil sight glass
// HSKB additionally: solenoid oil valve

HS.95

Oil supply monitoring integrated in the compressor, oil line components included in the scope of delivery:

// Solenoid oil valve
// Oil filter

Related pressure equipment

BITZER offers a wide selection of pressure equipment for oil and refrigerant circuit. They are listed in the "Products" register "Heat Exchangers and Pressure Vessels" on the website www.bitzer.de.

Oil monitoring

HS.53, HS.64, HS.74

// Oil flow switch is accessory

// Electrical accessories for 2 alternative monitoring concepts

- SE-B3 and electrolytic capacitor with time relay
- included in the functionality of the optional SE-i1

HS.85

// Integrated oil management system

- automatic oil stop valve
- integrated oil filter
- monitoring of oil flow and of oil filter for contamination and pressure drop

// Electrical accessories in the switch cabinet

- SE-B3 for the integrated oil flow switch
- monitoring of the oil supply: SE-B3 and electrolytic capacitor with time relay

// or in terminal box as function of the optional SE-i1

HS.95

// Monitoring of the oil supply integrated into the IQ MODULE

For details on the protection devices see online document CT-120, for details on the function and operation of the SE-i1 see Technical Information CT-110 and for CM-SW-01 see Technical Information ST-150.

Refrigeration compressor oils

BSE170

// Viscosity: 170 cSt at 40°C

// Maximum allowable oil injection temperature: 100°C

// For all permitted refrigerants except R22

// Within the documented application limits

B150SH and B100

// Viscosity: B150SH 150 cSt, B100 100 cSt each at 40°C

// maximum allowable oil injection temperature: B150SH 100°C, B100 80°C

// for R22

// B150SH within the documented application limits from $t_o \geq -40°C$,

// B100 for low temperature application up to $t_c \leq 45°C$ and $t_o \leq -5°C$

SHC228

// viscosity: 100 cSt at 40°C

// maximum allowable oil injection temperature: 100°C

// for R290 and R1270

// within the documented application limits

Intelligent compressor protection and electronic oil monitoring

The compressor protection devices of the semi-hermetic screw compressors monitor and protect beyond the requirements of EU standards. Contained in scope of delivery:

HS.53, HS.64, HS.74
SE-E4 + SE-B3 with accessories

HS.85
SE-E4 + 2 SE-B3 with accessories

HS.95
IQ MODULE CM-SW-01

Compressor protection devices

Intelligent compressor protection	SE-E4	SE-E5	SE-i1	CM-SW-01
suitable for	HS.53 HS.64 HS.74 HS.85	HS.53 HS.64 HS.74 HS.85	HS.53 HS.64 HS.74 HS.85	HS.95
Motor voltage	200 .. 690V	83 .. 575V	200 .. 690V	83 .. 690V
Motor frequency	50/60 Hz ∿	50/60 Hz FI operation	FI operation/ soft starter	FI operation
Permitted ambient temperature	-30 .. +60°C	-30 .. +60°C	-30 .. +60°C	-30 .. +70°C
Thermal motor monitoring	✔	✔	✔	✔
Monitoring of the discharge gas temperature	✔	✔	✔	✔
Rotation direction monitoring	✔	✔	✔	✔
Phase failure monitoring	✔	✔	✔	✔
Restart delay	✔	✔	①	①
Suitable for FI operation		✔	✔	✔
Monitoring of the oil supply	additional device required	additional device required	✔	✔
Monitoring of the cycling rate			✔	✔
Monitoring of application limits			✔	✔
Low pressure cut out				✔
High pressure switch			✔	✔
Status LEDs			✔	✔
Data log			✔	✔
Early warning system			✔	✔
Communication (BEST/Modbus)			✔	✔
CE and UL approval	✔	✔	✔	✔

① Monitoring of cycling rate

SE-i1

The SE-i1 protection device offers extended motor protection functions and complete application limits monitoring with multi-level warning and alarm messages. With the help of the Modbus interface, the data can be transferred to the superior system controller or to the BEST SOFTWARE. This enables fast fault analysis and maintenance.

// motor protection
  – all basic functions of SE-E4

// data log
  – alarm events
  – temperature
  – pressure values and statistical data on the running time and load profile of the compressor

// application limits monitoring
  – adapted to the HS. compressors

// monitoring of oil circuit

// integrated communication
  – modbus communication with BEST SOFTWARE via BEST interface converterr

// for FI operation

// for softstarter operation

// simplified system installation
  – less cables between compressor and system control

// warnings
  – An early warning system reports critical operating conditions.

// The SE-i1 basis sensor kit includes the monitoring of motor temperature, discharge gas temperature (cut-off), oil supply, rotation direction and phase failure, cycling rate, maximum and minimum motor speed and one optional temperature.

// The full sensor kit additionally monitors the discharge gas temperature (measurement and cut-off) and the application limits.



ELECTRONIC COMPONENTS

IQ MODULE CM-SW-01 for HS.95

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

The new, extended protection concept

// Intelligent activation to improve system efficiency
- start unloading
- V_i control
- capacity control

// Monitored compressor parameters
- motor and discharge gas temperature
- oil monitoring with oil pressure transmitter and oil level switch in the compressor
- rotation direction
- high 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 analog inputs and outputs
- history of alarm and warning messages
- operating time and load statistics

// Communication
- via Modbus (standardised interface)
- via Bluetooth
- configuration and operational monitoring via the BEST SOFTWARE
- status LEDs for fast initial diagnosis



IQ INTELLIGENT PRODUCTS

BEST SOFTWARE

Via PC, a lot of BITZER IQ products may be configured with the BEST SOFTWARE. With its intuitive user interface displays a complete operating status overview including data log for easy maintenance and service. This is completely in line with our innovation targets.

Easy configuration

// Easy device parameterisation

// Storage and installation 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 analog inputs and outputs

// Current operating point in the application limit

// 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

Communication

// Via BEST interface converter and Bluetooth



WIRELESS LOCAL AREA NETWORK

VARIPACK – External BITZER Frequency Inverters

For easy and safe capacity control, the BITZER VARIPACK series is a new generation of intelligent frequency inverters that can be used with all semi-hermetic screw compressors.

The new VARIPACK frequency inverter series was specially developed for refrigeration and the operation of BITZER refrigeration compressors. The focus of development was the ease of operation, reliability and high performance of the frequency inverters.

Selection and assignment

The VARIPACK frequency inverters are fully integrated into the BITZER SOFTWARE and can be found under the "Accessories" button. The operation is permitted within these frequency ranges:

// HS.53 .. HS.85: 20 .. 75 Hz

// HSNP74 and HSNP85: 20 .. 70 Hz

// HS.95: 20 .. 60 Hz

// Booster applications upon request

Further information see online document ST-420. Detailed application limits are documented in the BITZER SOFTWARE. The visualisation of the resulting application limits allows to create an efficient, reliably operating and cost-effective system design, even without extensive special knowledge on frequency inverters and manual calculation steps.

Operation

Communication with the VARIPACK frequency inverters for configuration, monitoring and reading out of fault messages can be done out with the BEST SOFTWARE.

Enclosure class

The VARIPACK are available in IP20, IP55 and IP66:



F.Y IP66 | **F.U** IP20 | **F.W** IP55

Further information see brochure CP-110.

Approvals

BITZER offers ex-works approvals that stand for high quality of the compressors and the manufacturing processes. The respective approval of a legal area naturally includes all design and manufacturing-related legal acts of the respective legal area.

// CE: EU area

// UKCA: United Kingdom

// UL/CSA: USA/Canada and Saudi Arabia

The basic construction of the compressors is designed for the conditions of the CE legal area. Any other product marking may require a special design or equipment and must be known when the order is received. The respective compressor is individually marked. The design of the compressors according to the British product marking UKCA will be offered by BITZER from January 2023.

Special approvals

// BV (Bureau Veritas)

// DNV (Det Norske Veritas)

// LR (Lloyds Register of Shipping)

// RMRS (Russian Maritime Register of Shipping)

// further approvals upon request

BITZER works with a wide variety of international certification bodies, in particular ship classification societies. These approvals usually require an inspection of the compressor at the factory by a representative of the certifying body. The desired special approval must therefore be known at the latest when the order is received. Subsequent approval confirmations are not possible.

Special type approval certificates are summarised in the online document AU-100.

New refrigerants with low warming potential

The semi-hermetic screw compressors can be used with new low global warming potential (GWP) refrigerants. These refrigerants are important tools to reach the emission reductions of the EU Regulation 517/2014 and similar scenarios clearly decided worldwide. This application is part of our innovation targets.

The unsaturated fluorinated hydrocarbon (HFO) R1234yf, a variant of tetrafluoropropene, plays a central role in this. It can be used as pure substance or as a component of blends – see also the application limits.

The pure substance R1234yf is classified as flammable in A2L according to ISO817. For the environmentally friendly refrigerants R290 propane and R1270 propene, special compressor models HSNP are available. As R290 and R1270 are classified flammable in A3, the compressor protection device is not mounted in the terminal box, but placed separately. For flammable refrigerants, a risk assessment for the system has to be made reflecting the flammability. 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 HS. compressors are not applicable. Consultation with BITZER is absolutely necessary.

Performance data for the entire application range are available in the BITZER SOFTWARE.

HFO READY

NATURAL REFRIGERANTS

Model designation

Example

HSK 8581 - 160 - 40P

Semi-hermetic screw compressor

HS**K** 8581 - 160 - 40P

Application range
K = Air conditioning and medium temperature application
N = Low temperature application

HSK **B** 8581 - 90 - 40P

Booster design

HSN **P** 8591 - 160 - 40P

Special design for R290 and R1270

HSK **85**81 - 160 - 40P

Housing size

HSK 858**8** - 160 - 40P

Displacement

HSK 8581 **1** - 160 - 40P

Compressor execution

HSK 8581 - **160** - 40P

Motor size and design

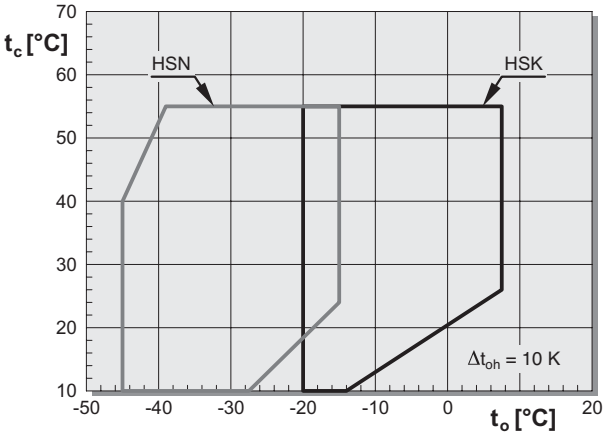
HSK 8581 - 160 - **40P**

Motor code

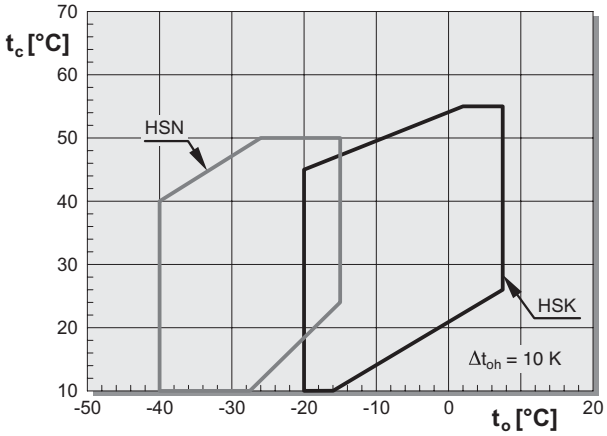
Application limits

HS.53 .. HS.85

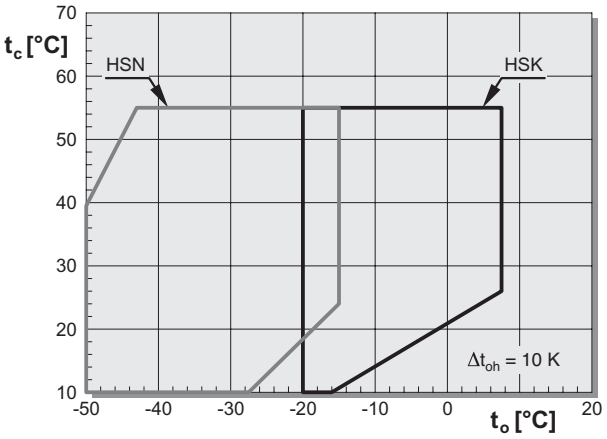
R448A ▮ R449A ▮ R407A ▮ R407F CR100%



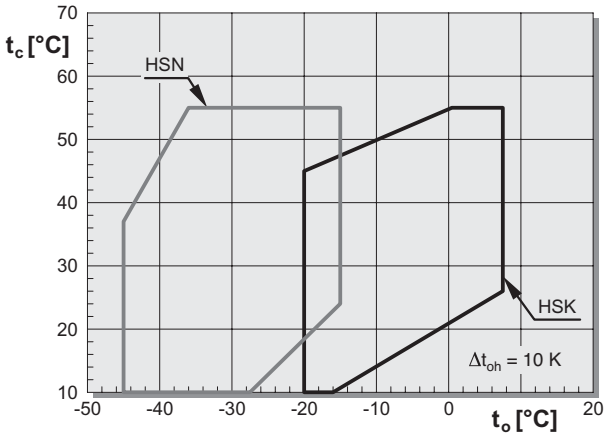
R448A ▮ R449A ▮ R407A ▮ R407F CR75% ▮ CR50%



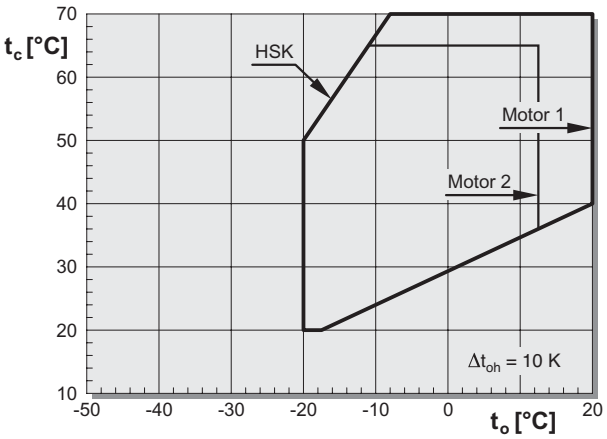
R404A ▮ R507A CR100%



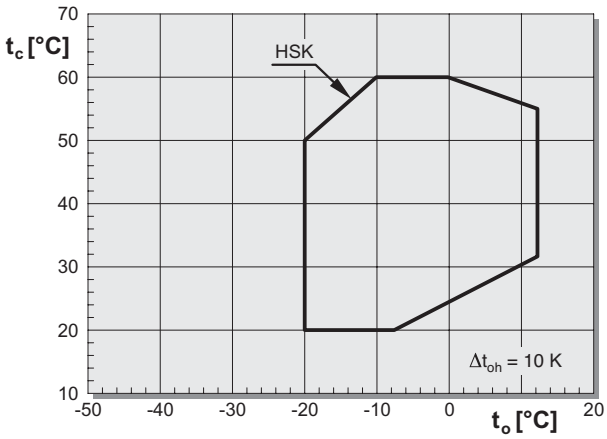
R404A ▮ R507A CR75% ▮ CR50%



R1234yf ▮ R134a ▮ R513A ▮ R450A



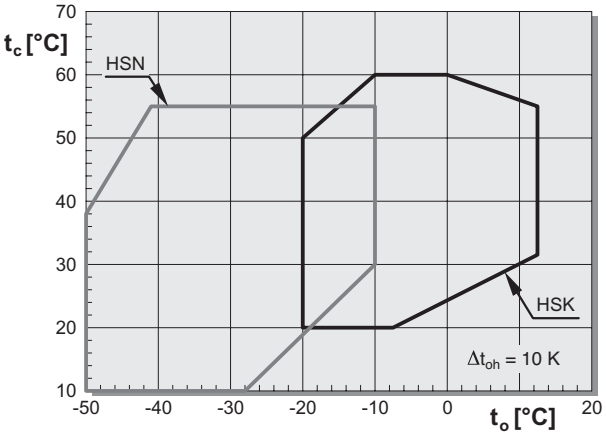
R407C



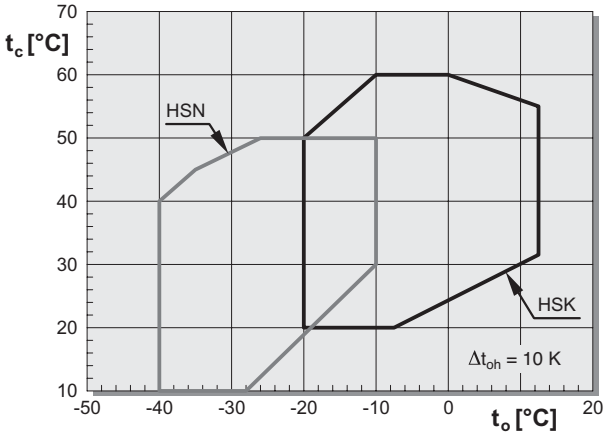
Application limits

HS.53 .. HS.85

R22 CR100%

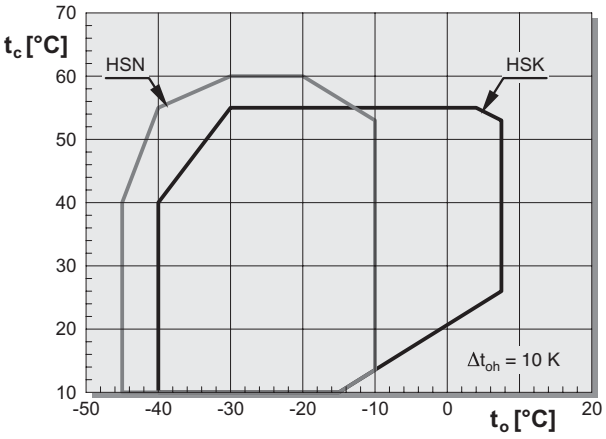


R22 CR75% ∎ CR50%

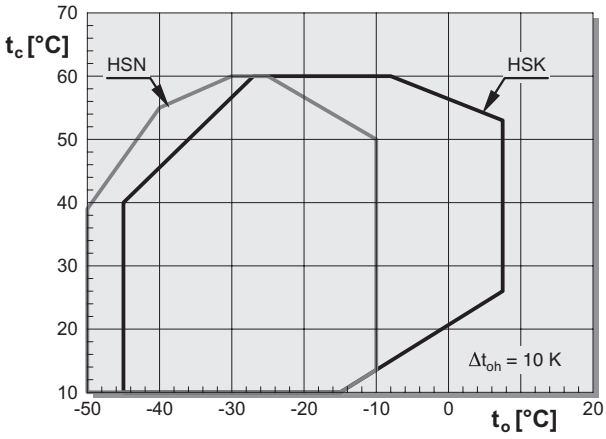


HS.95

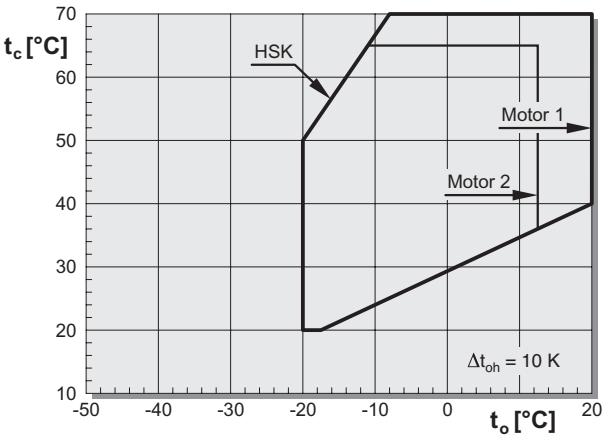
R448A ∎ R449A ∎ R407A ∎ R407F



R404A ∎ R507A



R1234yf ∎ R134a ∎ R513A ∎ R450A



Legend

t_o Evaporation temperatur (°C)
t_c Condensing temperature (°C)
Δt_{oh} Suction gas superheat (K)

Oil cooling

For ranges in which oil cooling becomes necessary see BITZER SOFTWARE. Here, the required oil cooler capacity can be determined.

ECO operation

Maximum condensing temperature may be limited. For ECO application limits, see BITZER SOFTWARE.
With HS.53 to HS.74 in ECO operation, the capacity control is limited to one regulation step (CR 75%). Exceptions are possible depending on the operating conditions. This requires individual coordination with BITZER. Use both regulation steps for start unloading only.

FI operation

Depending on the frequency range, the maximum condensing temperature may be limited, see BITZER SOFTWARE.

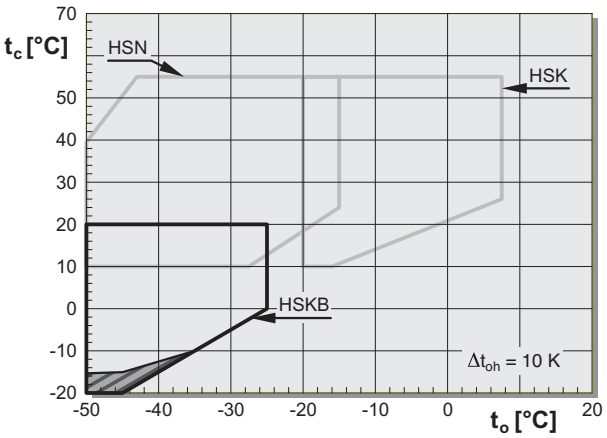
Application limits for HS.95:
Tentative data

Application limits

Booster

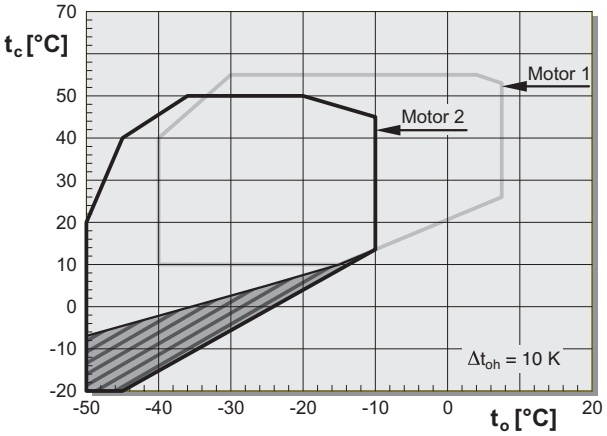
HS.53 .. HS85

R448A ▮ R449A ▮ R404A ▮ R507A

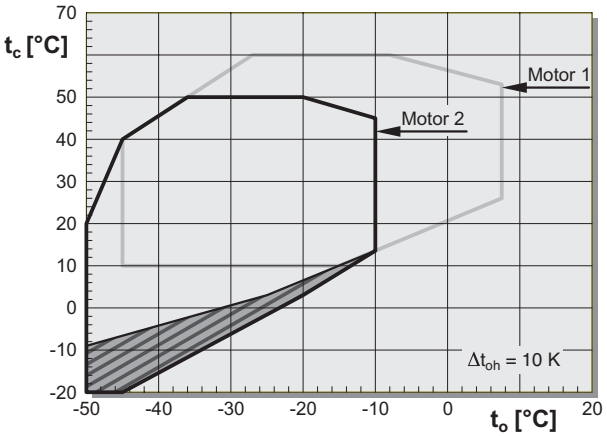


HS.95

R448A ▮ R449A



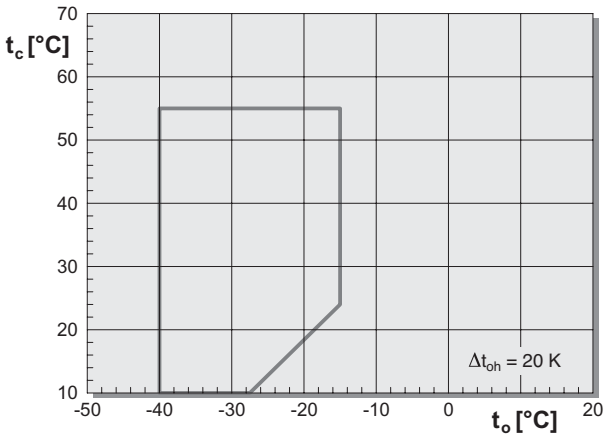
R404A ▮ R507A



Compressors for R290 and R1270

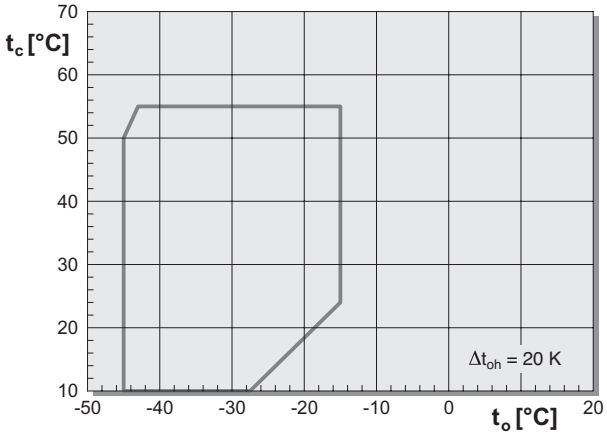
HSNP74 .. HSNP85

R290



HSNP74 .. HSNP85

R1270



Legende

t_o Evaporation temperature (°C)
t_c Condensing temperature (°C))
Δt_{oh} Suction gas superheat (K)
External oil pump required

Oil cooling

Ranges in which oil cooling becomes necessary upon request.

ECO operation

Data upon request.

FI operation

Depending on the frequency range, the maximum condensing temperature may be limited. This requires individual coordination with BITZER.

Application limits shown here are tentative data.

Performance data

BITZER SOFTWARE

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

// Calculation results and individually defined performance tables for compressors

// Seasonal calculation

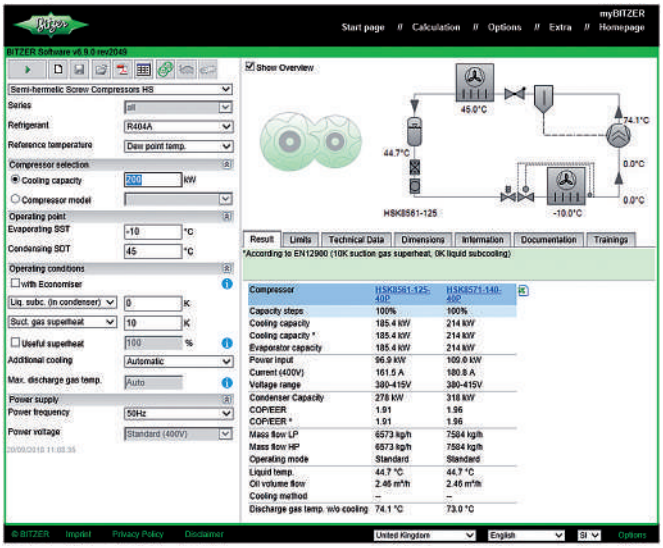
// Compound connection

// Available accessories and their selection

// All relevant technical documents

// Further BITZER products

bitzer-software.com



ASERCOM certified performance data

The Association of European Refrigeration Component Manufacturers (ASERCOM) has implemented a procedure of certifying compressor performance data.

The high standard of this certification is guaranteed by

// plausibility checks of data carried out by experts

// regular random tests at indepen-dent 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 yet.

Performance data of compressors which meet the strict requirements may carry the label "ASERCOM certified product". All certified compressors and further information are listed on the ASERCOM web site (www.ASERCOM.org).

CERTIFIED PRODUCT ASERCOM

In the BITZER SOFTWARE the appropriate compressors are marked with this label.

Performance data

Performance data based on European standard EN12900 and 50 Hz operation. Evaporation and condensing temperatures correspond to "dew point" conditions (saturated vapor).

Standard conditions

With standard conditions, no liquid subcooling is considered according to EN12900. Therefore the rated cooling capacity and efficiency (COP) show lower values in comparison to data based on 5 or 8.3 K of subcooling.

Economiser operation (ECO)

Data for economiser operation inherently include liquid subcooling. The liquid temperature is defined as 5 K above saturated temperature according to EN12900 at economiser inlet ($t_{cu} = t_{ms} + 5$ K).

Technical data

Model	Motor version ①	Displacement 50/60 Hz ② m³/h	Cooling capacity Q_o R1234yf t_o / t_c 5°C/45°C kW	R448A R449A t_o / t_c -10°C/45°C kW	R448A R449A t_o / t_c -35°C/40°C with ECO kW	R1270 t_o / t_c -35°C/40°C with ECO kW	Capacity steps nominal ③ %	Weight ⑤ kg	Motor connection ⑥	Max. operating current ⑦ A	Max. power consumption ⑦ kW
HSK5343-30	1	84/101	46.9	40.8	–	–	100/90/70	170	400V±10%Δ/ΔΔ-3-50 Hz 460V±10%Δ/ΔΔ-3-60 Hz Part winding	52	33
HSN5343-20	1		–	–	21.7	–	100/90/55	166		48	29
HSK5353-35	1	100/121	57.3	49.3	–	–	100/85/60	178		58	37
HSN5353-25	1		–	–	25.6	–	100/80/50	169		52	33
HSK5363-40	1	118/142	67.7	58.7	–	–	100/80/55	183		66	42
HSN5363-30	1		–	–	29.9	–	100/75/45	174		58	37
HSK6451-40	2	140/168	82.0	–	–	–	100/85/60	234		65	35
HSK6451-50	1		82.0	71.5	–	–	100/85/60	238		79	50
HSN6451-40	1		–	–	36.0	–	100/75/50	234		65	42
HSK6461-40	2	165/198	97.8	–	–	–	100/80/55	238		65	42
HSK6461-60	1		97.8	86.0	–	–	100/80/55	246		98	65
HSN6461-50	1		–	–	42.2	–	100/75/45	238		79	52
HSK7451-50	2	192/232	118.7	–	–	–	100/75/45	297		79	51
HSK7451-70	1		118.7	104.0	–	–	100/75/45	305		124	75
HSN7451-60	1		–	–	50.6	–	100/80/65	297		98	65
HSNP7451-60	1	192/232	–	–	–	66.4	100/80/65	297		98	65
HSK7461-60	2	220/266	136.2	–	–	–	100/70/40	310		98	56
HSK7461-80	1		136.2	119.2	–	–	100/70/40	314		144	85
HSN7461-70	1		–	–	58.3	–	100/75/60	310		124	75
HSNP7461-70	1	220/266	–	–	–	75.9	100/75/60	310		124	75
HSK7471-70	2	250/302	148.0	–	–	–	100/60/40	326		124	61
HSK7471-90	1		148.0	130.5	–	–	100/60/40	336		162	92
HSN7471-75	1		–	–	62.5	–	100/75/55	326		144	85
HSNP7471-75	1	250/302	–	–	–	81.3	100/75/55	326		144	85
HSK8551-80	2	315/380	181.8	–	–	–	100 ⇔ 50 oder 100/75/50 ④	550		144	88
HSK8551-110	1		181.8	161.5	–	–		565		180	110
HSK8561-90	2	359/433	207	–	–	–		560		155	96
HSK8561-125	1		207	184.6	–	–		575		226	132
HSN8561-110	1		–	–	81.0	–		565		217	126
HSNP8561-110	1	359/433	–	–	–	117.4		565		217	126
HSK8571-110	2	410/495	238	–	–	–		565		182	110
HSK8571-140	1		238	213	–	–		580		246	150
HSN8571-125	1		–	–	103.9	–		575		226	132
HSNP8571-125	1	410/495	–	–	–	137.1		575		226	132
HSK8581-125	2	470/567	263	–	–	–		585		215	118
HSK8581-160	1		263	248	–	–		605		277	162
HSK8591-140	2	535/646	303	–	–	–		590		246	135
HSK8591-180	1		303	277	–	–		620		330	181
HSN8591-160	1		–	–	129.0	–		610		305	177
HSNP8591-160	1	535/646	–	–	–	169.3		610		305	177
HSK9573-180	2	700/845	409	–	–	–	100 ⇔ 25	970	400V±10%Δ-3-50 Hz 460V±10%Δ-3-60 Hz Y/Δ	⑧	⑧
HSK9573-240	1		409	364	–	–		1010		410	242
HSK9583-210	2	805/972	472	–	–	–		990		⑧	⑧
HSK9583-280	1		472	431	–	–		1030		444	263
HSN9583-240	1		–	–	209	–		1020		⑧	⑧
HSK9593-240	2	910/1098	535	–	–	–		1070		⑧	⑧
HSK9593-300	1		535	486	–	–		1100		490	306
HSK95103-280	2	1015/1225	598	–	–	–		1100		⑧	⑧
HSK95103-320	1		598	547	–	–		1120		566	334
HSN95103-280	1		–	–	261	–		1100		⑧	⑧

Technical data

Booster compressors

Model	Motor-version	Displace-ment 50/60 Hz ② m³/h	Cooling capacity Q_o R448A R449A t_o / t_c -45°C/-10°C kW	Capacity steps nominal ③ %	Weight ⑤ kg	Motor connection ⑥	Max. operating current ⑦ A	Max. power consumption ⑦ kW
HSKB5343-15	3	84/101	13.8	100/90/70	168	400V±10%Δ/ΔΔ-3-50 Hz 460V±10%Δ/ΔΔ-3-60 Hz Part winding	23	11
HSKB5353-20	3	100/121	16.4	100/85/60	176		30	16
HSKB5363-25	3	118/142	19.5	100/80/55	181		38	23
HSKB6451-40	3	140/168	23.4	100/85/60	234		47	23
HSKB6461-40	3	165/198	27.6	100/80/55	234		52	27
HSKB7451-40	3	192/232	33.7	100/75/45	285		60	32
HSKB7461-40	3	220/266	38.3	100/70/40	290		68	38
HSKB7471-50	3	250/302	41.1	100/60/40	310		69	39
HSKB8551-60	3	315/380	51.8	100 ⇔ 50 oder 100/75/50 ④	550		84	50
HSKB8561-70	3	359/433	59.2		550		96	58
HSKB8571-80	3	410/495	68.0		550		104	63
HSKB8581-90	3	470/567	77.6		580		124	76
HSKB8591-110	3	535/646	88.7		585		135	83
HSK9573-180	2	700/845	130.4	100 ⇔ 25	970	400V±10%Δ-3-50 Hz 460V±10%Δ-3-60 Hz Y/Δ	⑧	⑧
HSK9583-210	2	805/972	153.0		990		⑧	⑧
HSK9593-240	2	910/1098	172.4		1070		⑧	⑧
HSK95103-280	2	1015/1225	192.2		1100		⑧	⑧

① Motor 2: Compressor is optimised for air conditioning and medium temperature application and low pressure refrigerants such as R1234yf and R134a.

② 50 Hz: at 2900 min^{-1}, 60 Hz at 3500 min^{-1}

③ Effective capacity steps depend on operating conditions.
K models -10/45°C (without ECO)
N models -35/40°C (without ECO)

④ 25%: integrated start unloading or HSK with low pressure ratio

⑤ Weight according to standard delivery condition:
HS.53 to HS.74 with suction gas shut-off valve and discharge gas flange, HS.85 and HS.95 with suction gas and discharge gas flange, each with brazed bush. Additional weight of the optional shut-off valves:
Ø42 mm (1 5/8"): 3 kg
Ø54 mm (2 1/8"): 5 kg
Ø64 mm (2 5/8"): 10 kg
Ø76 mm (3 1/8"): 10 kg
DN100: 20 kg
DN125: 50 kg

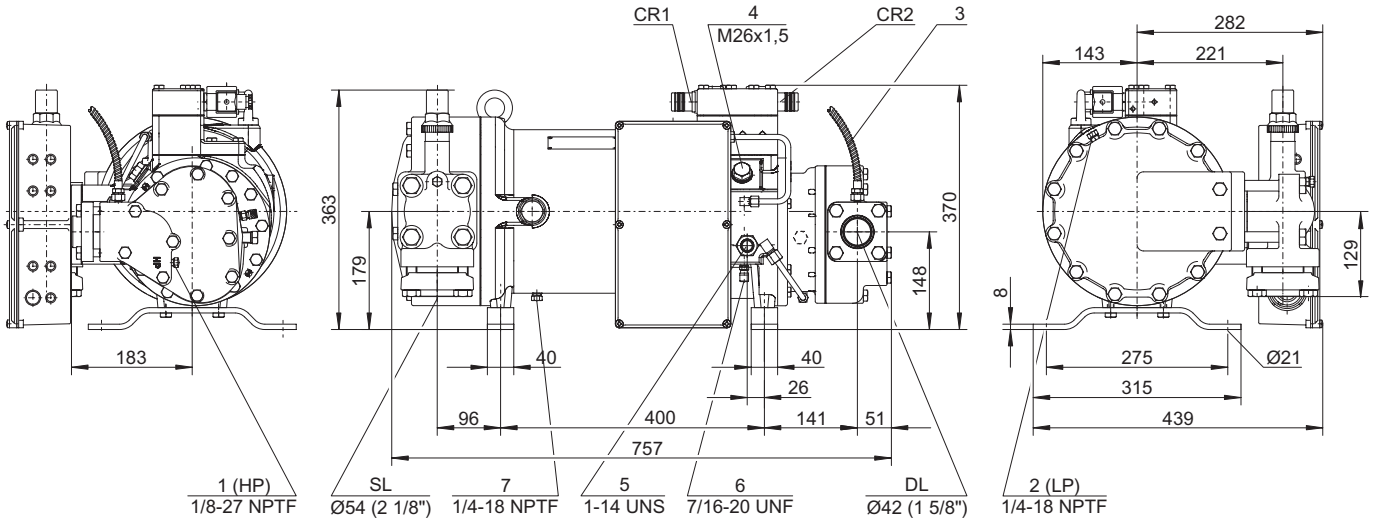
⑥ Other voltages and currents upon request.

⑦ Data valid for 50 Hz operation. For the selection of contactors, cables and fuses the max. operating current/max. power consumption must be considered.
Contactors: Operational category AC3

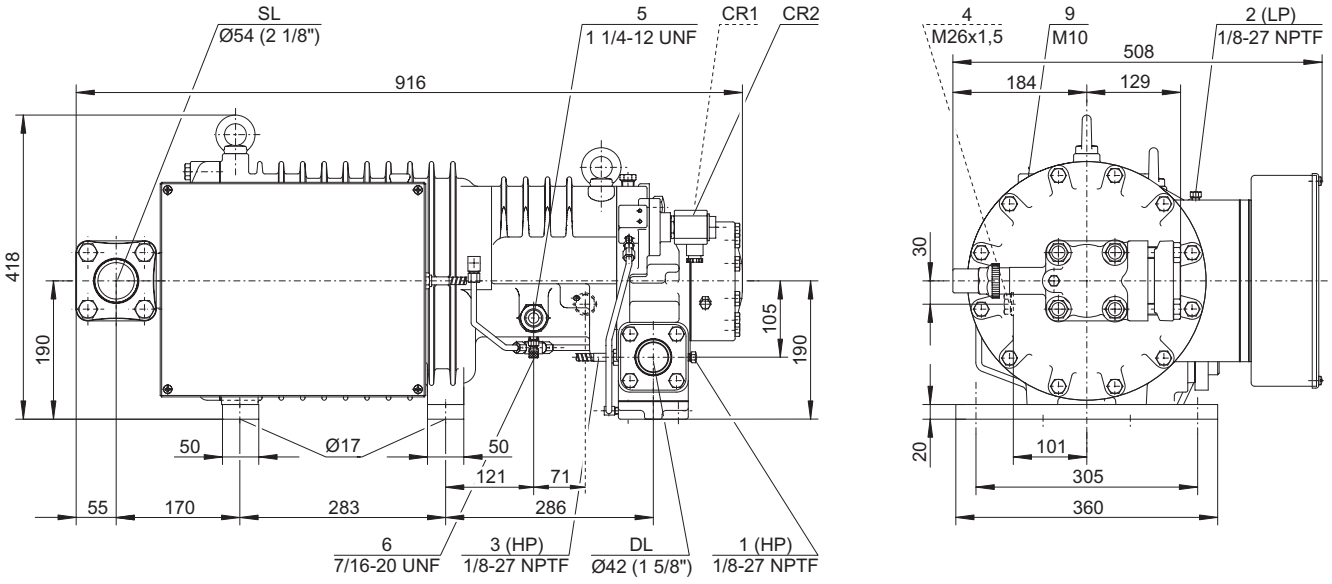
⑧ Data upon request

Dimensional drawings

HS.53..



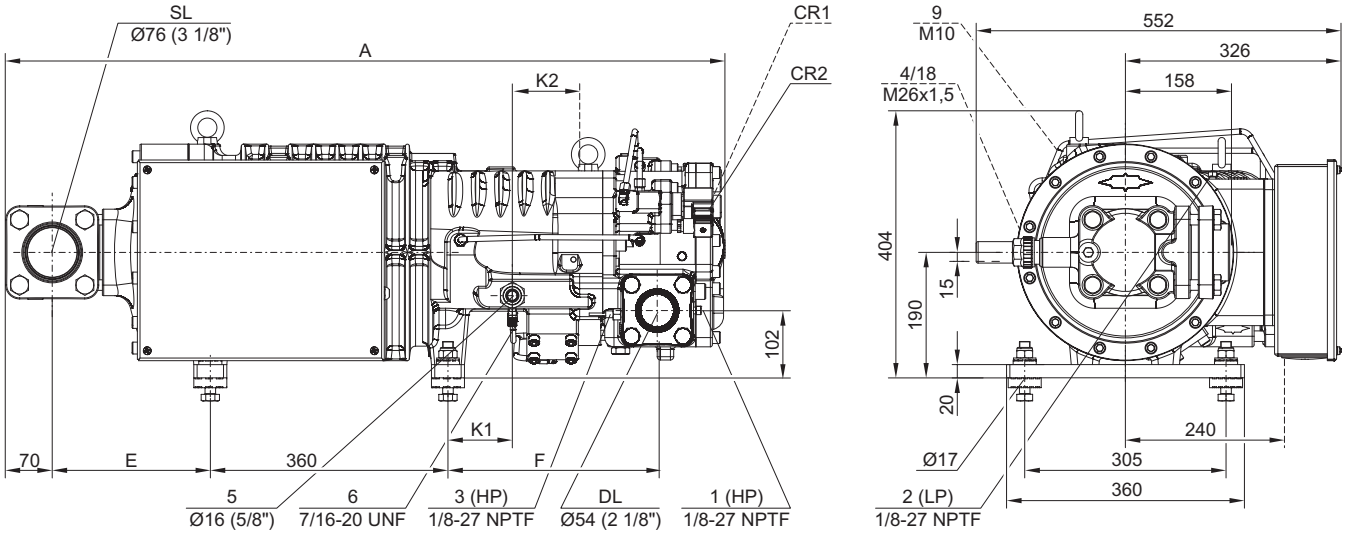
HS.64..



Connection positions see page 19.

Dimensional drawing

HS.74..



Model	A	E	F	K1	K2
	mm	mm	mm	mm	mm
HS.7451, HS.7461	1021	186	295	76	109
HSK7471-70, HSN7471-75	1034	186	318	98	97
HSK7471-90	1087	238	318	98	97

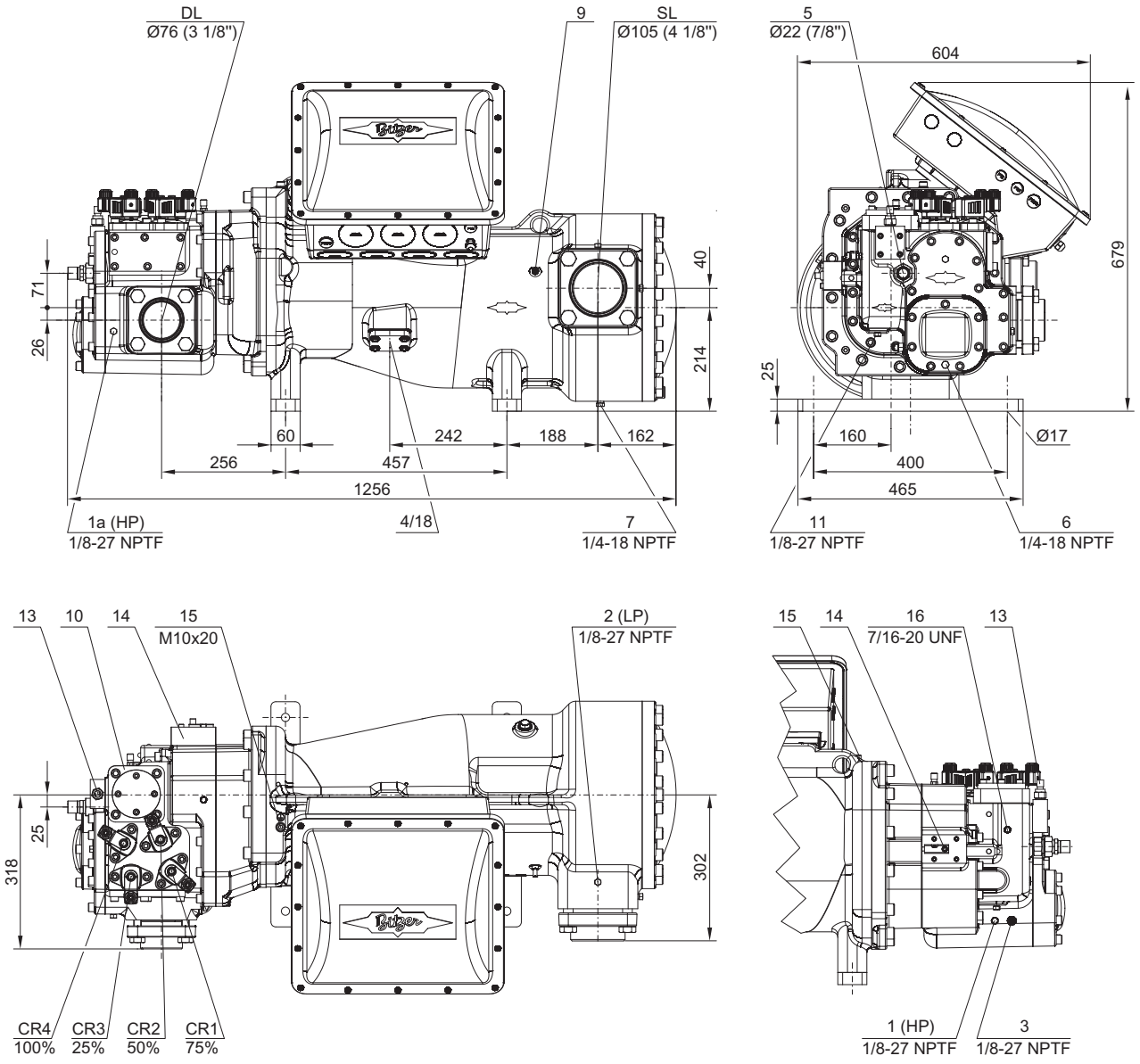
Connection positions

1 High pressure connection (HP)
Connection for high pressure switch (HP)
1a Additional high pressure connection (HP)
Not suitable for pressure switch or pressure transmitter!
1b Connection for high pressure transmitter (HP)
2 Low pressure connection (LP)
Connection for low pressure switch
2a Additional low pressure connection (LP)
2b Connection for low pressure transmitter (LP)
2c Low pressure connection for the minimum pressure differential control valve
3 Connection for discharge gas temperature sensor (HP)
4 Connection for economiser (ECO)
HS.85: ECO valve with connection line (option)
HS.95: ECO valve (option)
5 Connection/valve for oil injection
6 Oil pressure connection
7 Oil drain (compressor or motor housing)
9 Threaded bore for pipe fixture (ECO and LI lines)
10 Maintenance connection for oil filter
11 Oil drain (oil filter)
13 Oil filter monitoring
14 Oil flow switch
15 Earth screw for housing
16 Pressure blow-off (oil filter chamber)
18 Liquid injection (LI)
19 Compressor module
20 Slider position indicator
21 Oil level switch
22 Oil pressure transmitter
23 Connection for oil and gas return (for systems with flooded evaporator adaptor optional))
24 Access to oil circulation restrictor

SL Suction gas line
DL Discharge gas line

Dimensional drawing

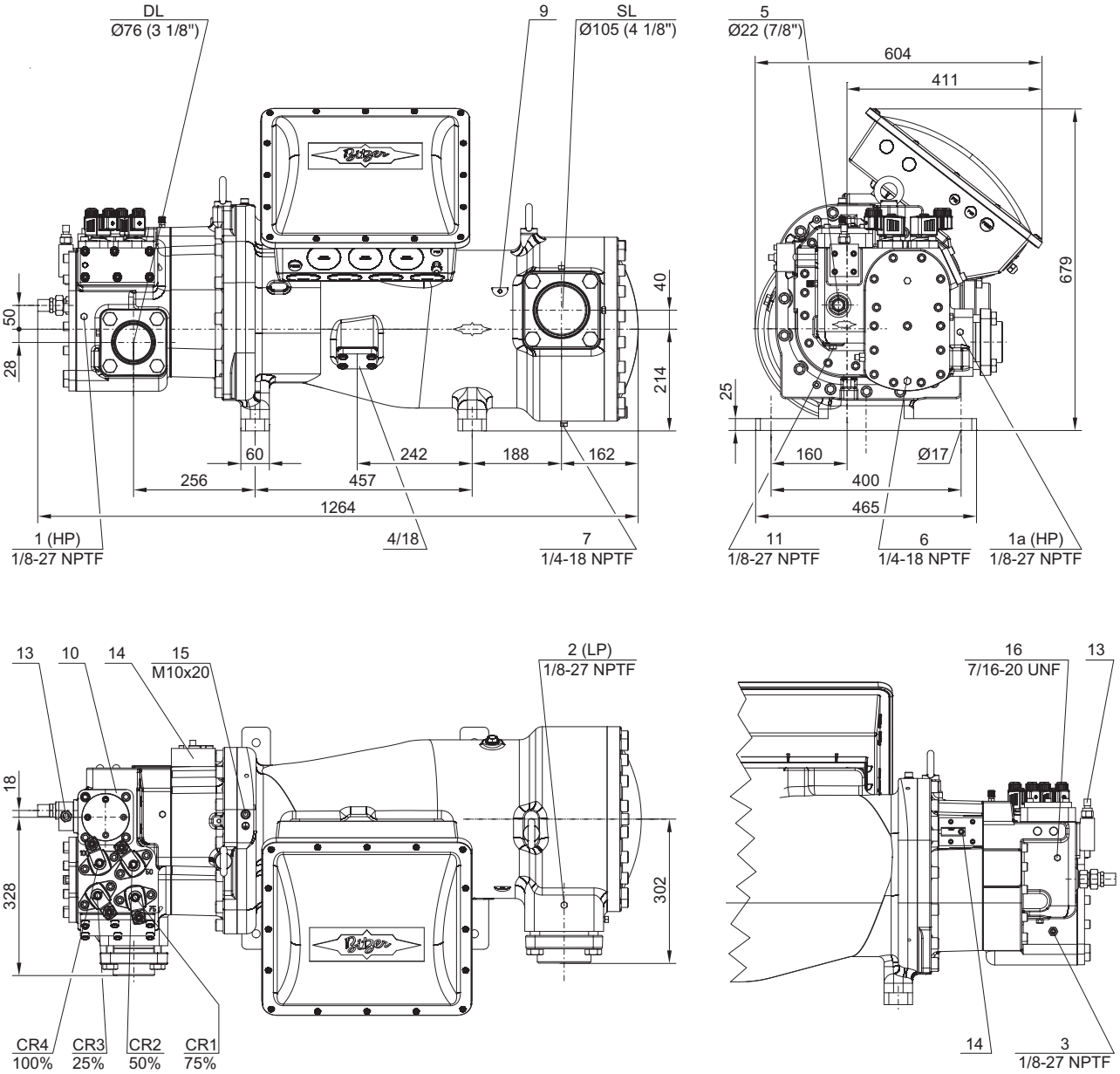
HS.8551 .. HS.8571



Connection positions see page 23.

Dimensional drawing

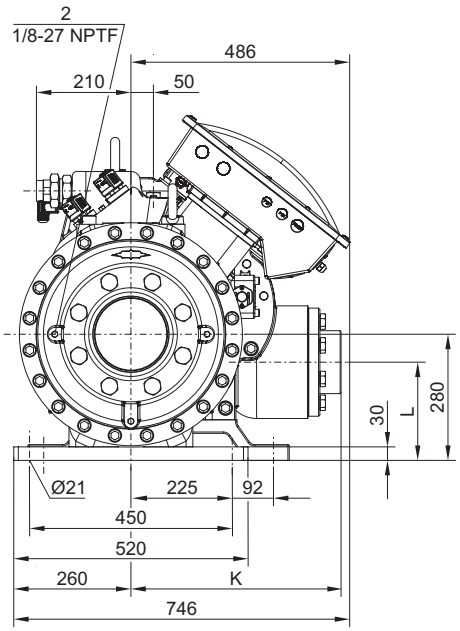
HS.8581, HS.8591

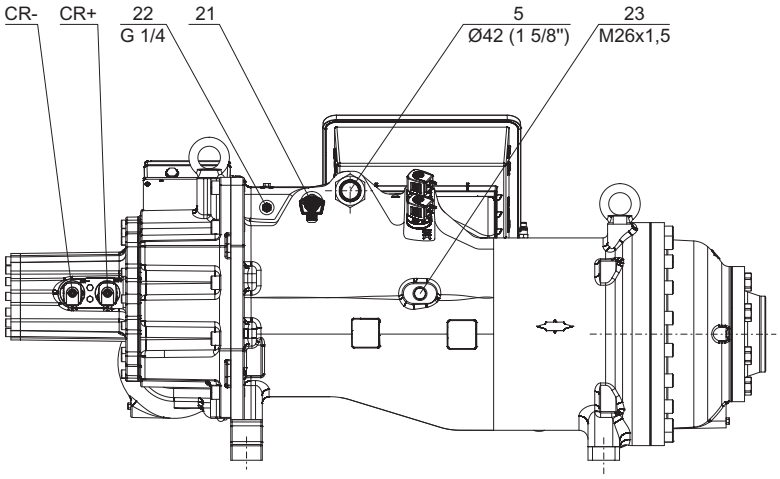


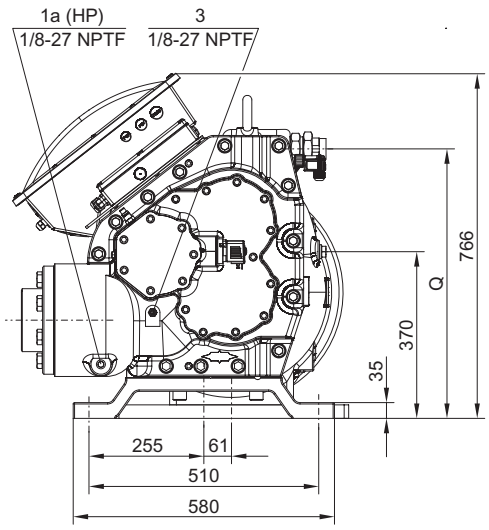
Connection positions see page 23.

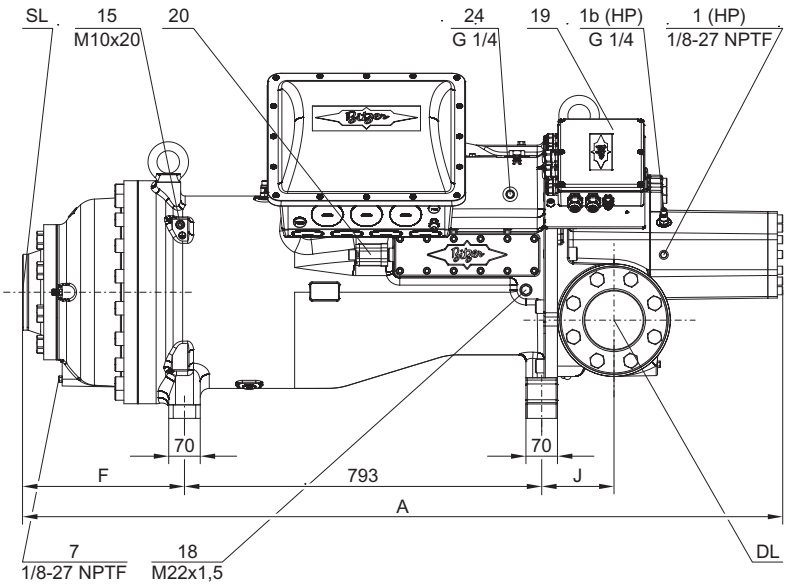
Dimensional drawing

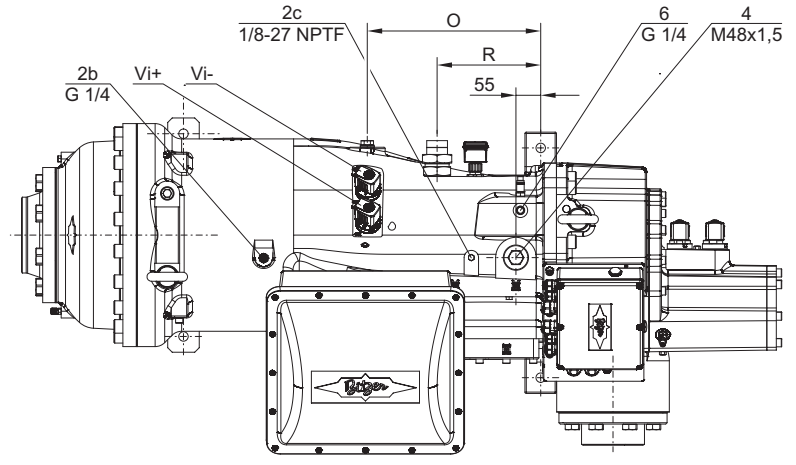
HS.95..











Connection positions see page 23.

Model	A	F	J	K	L	O	Q	R	SL	DL
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
HSK9573-180, HSK9573-240, HSK9583-210	1605	282	163	434	206	361	583	205	DN125	DN100
HSK9583-280	1632	309	163	434	206	361	583	205	DN125	DN100
HSN9583-240	1605	282	163	434	206	361	583	205	DN125	DN100
HSK9593-240, HSK9593-300, HSK95103-280, HSK95103-320, HSN95103-280	1688	360	160	466	218	385	598	230	DN150	DN125

Connection positions

1 High pressure connection (HP)
Connection for high pressure switch (HP)
1a Additional high pressure connection (HP)
Not suitable for pressure switch or pressure transmitter!
1b Connection for high pressure transmitter (HP)
2 Low pressure connection (LP)
Connection for low pressure switch
2a Additional low pressure connection (LP)
2b Connection for low pressure transmitter (LP)
2c Low pressure connection for the minimum pressure differential control valve
3 Connection for discharge gas temperature sensor (HP)
4 Connection for economiser (ECO)
HS.85: ECO valve with connection line (option)
HS.95: ECO valve (option)
5 Connection/valve for oil injection
6 Oil pressure connection
7 Oil drain (compressor or motor housing)
9 Threaded bore for pipe fixture (ECO and LI lines)
10 Maintenance connection for oil filter
11 Oil drain (oil filter)
13 Oil filter monitoring
14 Oil flow switch
15 Earth screw for housing
16 Pressure blow-off (oil filter chamber)
18 Liquid injection (LI)
19 Compressor module
20 Slider position indicator
21 Oil level switch
22 Oil pressure transmitter
23 Connection for oil and gas return (for systems with flooded evaporator adaptor optional))
24 Access to oil circulation restrictor

SL Suction gas line
DL Discharge gas line

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