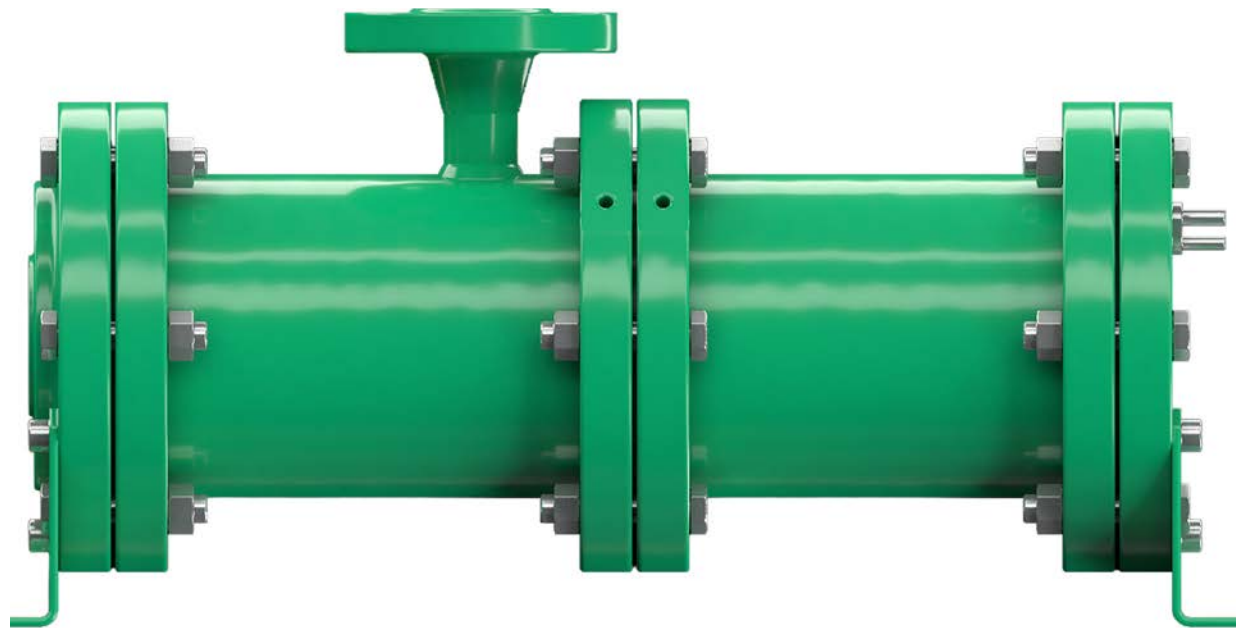


PRODUCT INFORMATION
CANNED MOTOR PUMP TYPE COTU

REFRIGERATION ENGINEERING



ZART®

simply best balance

Table of Contents

General information	3
Function	4
Operating principle	5
Bearings	5
Characteristic maps	6
2900 rpm 50 Hz	6
3600 rpm 60 Hz	7
Versions	8
Versions COTU	8
Materials / pressure stages / flanges	9
Noise expectancy values	9
List of parts	10
Dimension: 3 stages	11
Documentation and tests	12
Installation	13

Flow regulation	14
Flow regulator	14
Design software	17
Design software / services	17
Benefits of the design software	18
Contact	19



Table of Contents

General information
Function
Operating principle
Characteristic maps
Versions
List of parts
Collective measurements
Documentation and tests
Installation
Flow regulation
Design software
Contact

Information

Applications

- Food industry: Cooling and deep-freezing with natural refrigerants
- Sports and leisure facilities, such as bobsled tracks, ice rinks or ice hockey stadiums
- Cooling modules in the chemical industry
- Freeze-drying and oil-cooling systems for transformers
- CO₂ cooling for mainframes and server centres

Canned motor pump type COTU

The CAMh type is the specially adapted solution for CO₂ applications. As a high-pressure version, the COTU is optimally adapted to existing installation conditions and is suitable for 64 bar operating pressure with a test pressure of 96 bar.

Type / design

Horizontal, seal-less section-type pumps without canned motor, with radial impellers, multi-stage, single-flow.

Drive

The canned motor filled with liquid accelerates to the operating speed in seconds. It is wear-free and maintenance-free during continuous operation due to the hydrodynamic sleeve bearings. The motor is low-noise and low-vibration and is characterized by its high efficiency.

Operating data

Temperature

Application conditions	−50 °C to +5 °C
Standstill	−50 °C to +25 °C

Canned motors

Output	up to 3 kW
Speed	2800 rpm or 3500 rpm (frequency control possible – with frequency converter from 1500 rpm to 3500 rpm)
Voltage	230, 400, 480, 500, 575, 690 Volt
Frequency	50 or 60 Hz
Type of protection	IP 55

Pump and hydraulics designations

COTU 2 / 3 AGX 3.0

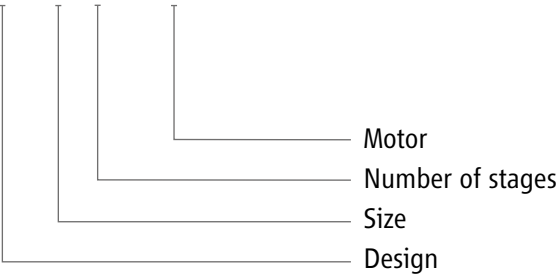


Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

Flow regulation

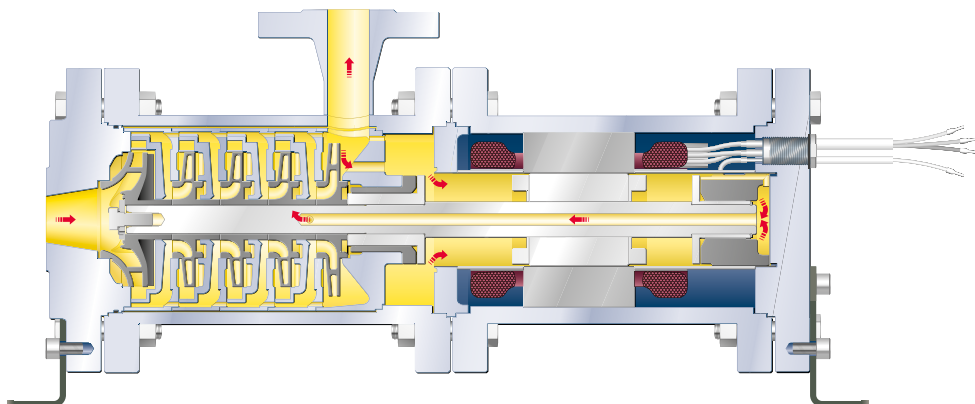
Design software

Contact

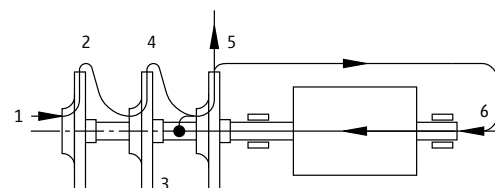


Function COTU

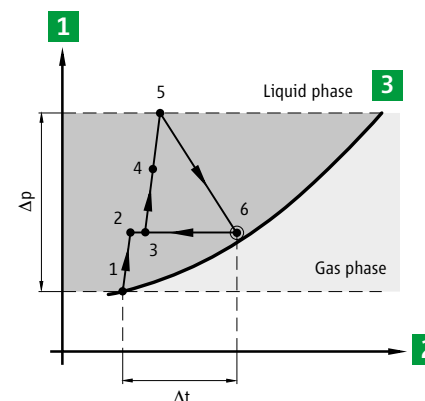
The partial flow for cooling the motor and lubricating the bearing is taken from the pressure side after the last impeller and passed through the motor chamber. The entire motor is immersed in the pumped liquid. The partial flow is not returned to the suction side of the pump through the hollow shaft, but rather between two impellers to an area with an increased pressure. Therefore, point 3 in the pressure-temperature diagram that corresponds to the greatest heating has sufficient distance from the vapour pressure curve to prevent gasification within the pump.



Partial flow return between the stages



Pressure-temperature diagram



- 1 Pressure
- 2 Temperature
- 3 Vapour pressure curve

[Table of Contents](#)

[General information](#)

Function

[Operating principle](#)

[Characteristic maps](#)

[Versions](#)

[List of parts](#)

[Collective measurements](#)

[Documentation and tests](#)

[Installation](#)

[Flow regulation](#)

[Design software](#)

[Contact](#)



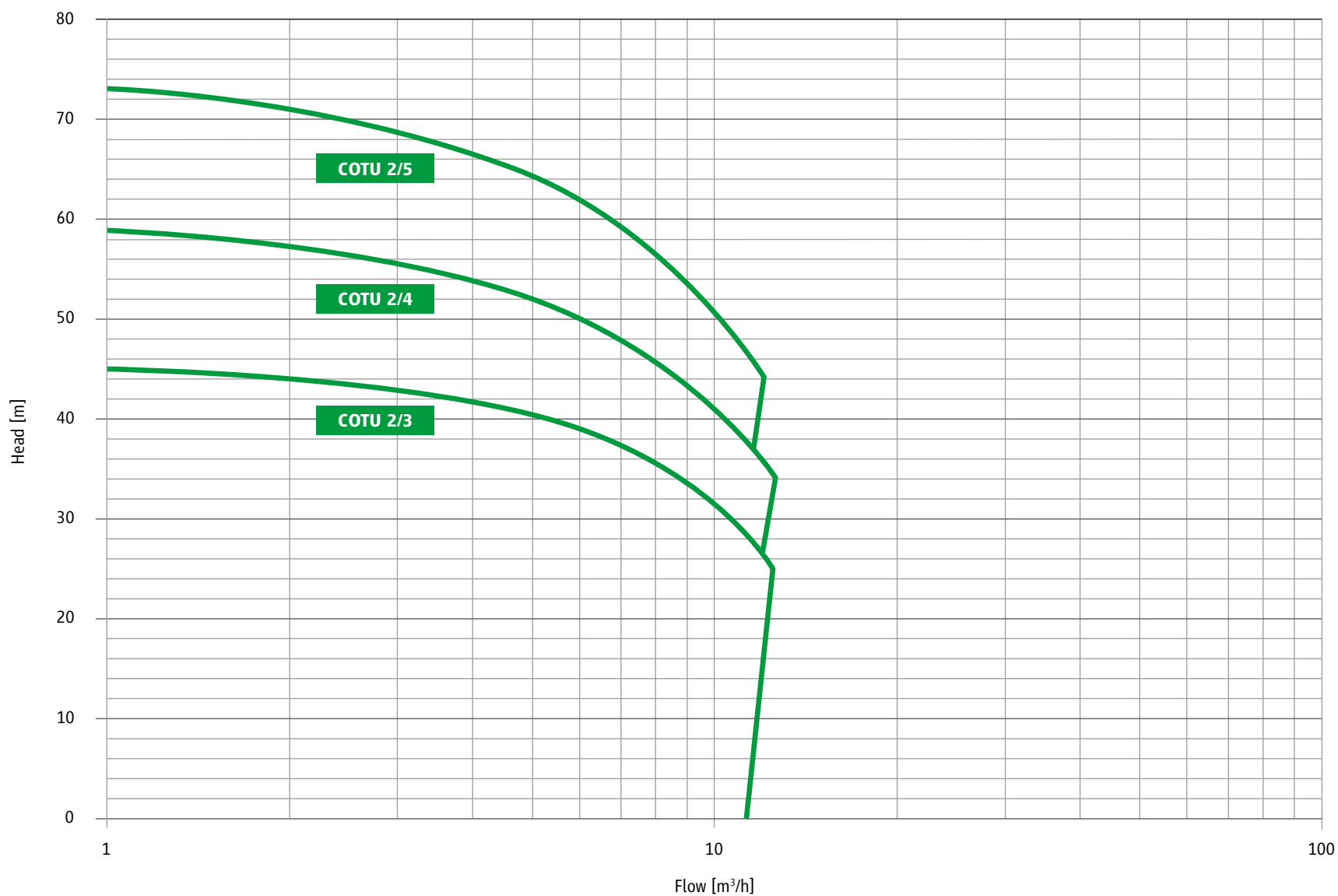
Bearings

The hermetically sealed design requires the arrangement of bearings in the pumped liquid. Therefore, only hydrodynamic plain bearings are used in HERMETIC pumps. With correct operational mode, these bearings have the advantage that there is no contact between the bearing sliding surfaces. As a result, they are wear-free and maintenance-free in continuous operation. A service life of 20 years is common for hermetically sealed pumps.

In refrigeration engineering, carbon graphite is used as the bearing bush material that can withstand particularly high radial and axial loads. In addition, the material has a high resistance to elevated and low temperatures and high fatigue strength.

[Table of Contents](#)[General information](#)[Function](#)[Operating principle](#)[Characteristic maps](#)[Versions](#)[List of parts](#)[Collective measurements](#)[Documentation and tests](#)[Installation](#)[Flow regulation](#)[Design software](#)[Contact](#)

2900 rpm 50 Hz



[Table of Contents](#)

[General information](#)

[Function](#)

[Operating principle](#)

[Characteristic maps](#)

[Versions](#)

[List of parts](#)

[Collective measurements](#)

[Documentation and tests](#)

[Installation](#)

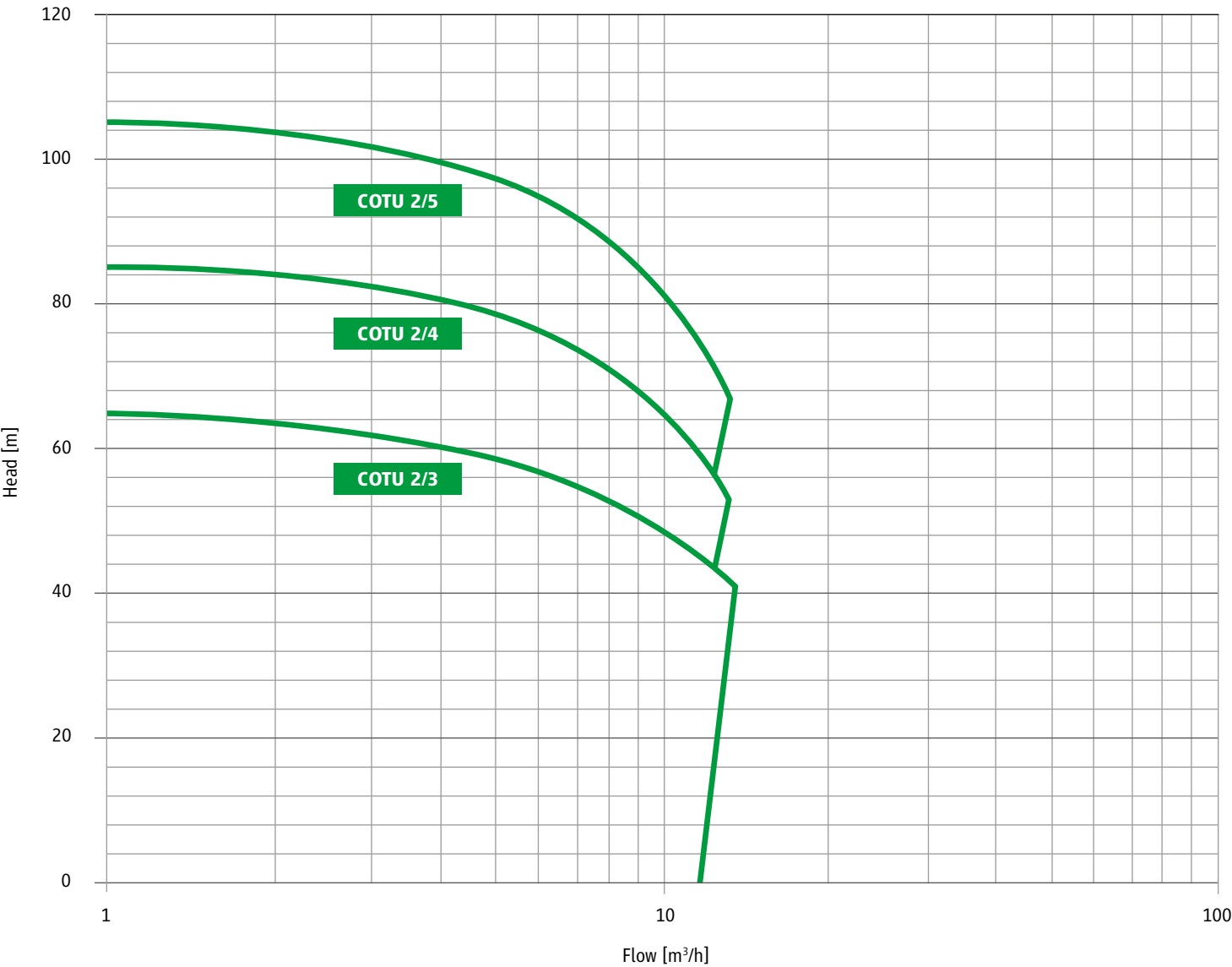
[Flow regulation](#)

[Design software](#)

[Contact](#)



3600 rpm 60 Hz



- Table of Contents
- General information
- Function
- Operating principle
- Characteristic maps**
- Versions
- List of parts
- Collective measurements
- Documentation and tests
- Installation
- Flow regulation
- Design software
- Contact



Versions COTU

Type	Motor	Pump data		Motor data 50 Hz / 60 Hz		Weight kg (approx.)	PN
		Q _{min} m³/h	Q _{max} m³/h	Output kW [P2]	Rated current at 400 V / 480 V		
COTU 2/3	AGX 3.0	1,5	14,0	3,0 / 3,4	7,1	132	64
COTU 2/4	AGX 3.0	1,5	14,0	3,0 / 3,4	7,1	134	64
COTU 2/5	AGX 3.0	1,5	14,0	3,0 / 3,4	7,1	136	64

Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

Flow regulation

Design software

Contact



Materials / pressure stages / flanges

Housing	P355N
Suction cover	S 355J2+N
Stage casing	1.0460
Diffuser	JL 1030
Impellers	JL 1030
Slide bearing	1.4021 / Coal
Shaft	1.4021
Seals	EPDM
Pressure rating	PN 64*
Flanges	according to DIN EN 1092-1; PN 64 type D (with groove)

* test pressure 96 bar

Noise expectancy values

Motors	AGX 3.0
Output power [P2 at 50 Hz]	3.0 kW
max. expected sound pressure level dB(A) at 50 Hz	52
Output power [P2 at 60 Hz]	3.4 kW
max. expected sound pressure level dB(A) at 60 Hz	52

Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

Flow regulation

Design software

Contact



List of parts COTU

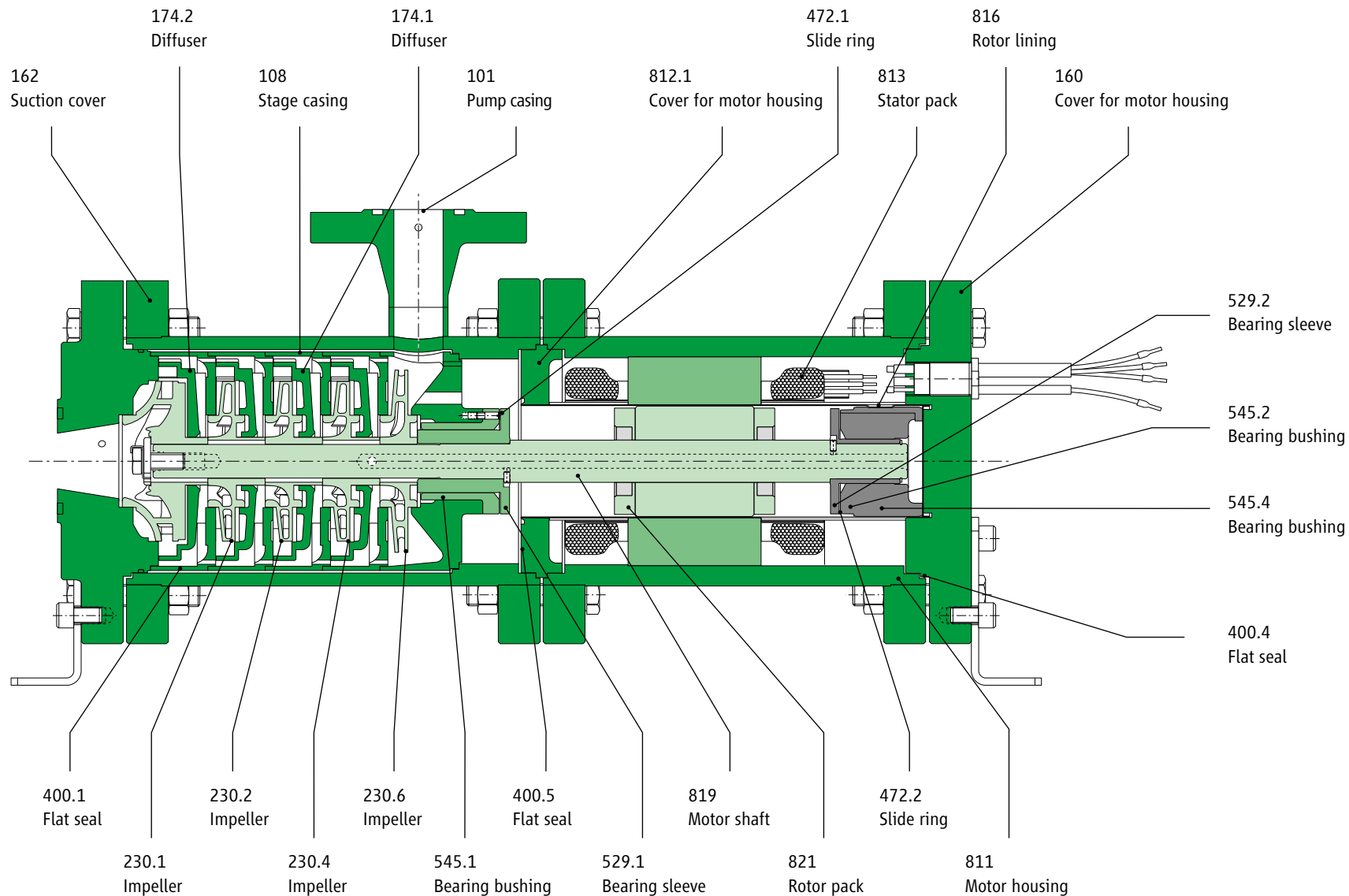


Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

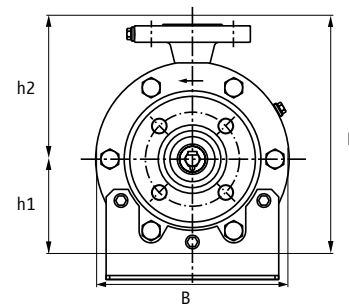
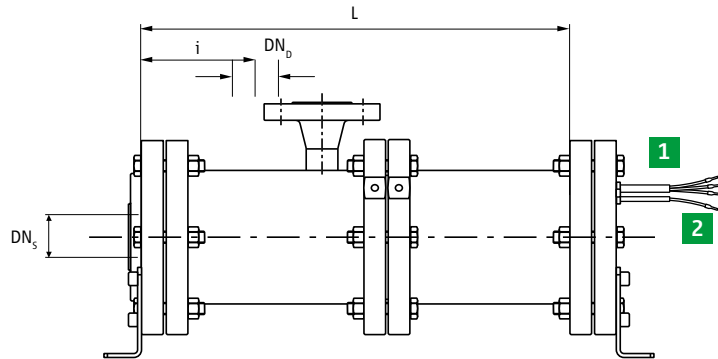
Flow regulation

Design software

Contact



Dimension: 3 stages



1 Cable U1, V1, W1 +
protective conductor $\oplus$
AGX 3.0: 4 x 1.5 mm²

2 Cable for PTC thermistor
2 x 1.0 mm²
Cable length 2.5 m

[Table of Contents](#)

[General information](#)

[Function](#)

[Operating principle](#)

[Characteristic maps](#)

[Versions](#)

[List of parts](#)

Collective measurements

[Documentation and tests](#)

[Installation](#)

[Flow regulation](#)

[Design software](#)

[Contact](#)



Documentation and tests

Documentation according to HERMETIC Standard consisting of:

- Operating manual for the HERMETIC pump
- Technical specifications
- Characteristic curve of the pump
- Sectional drawing
- Bills of materials
- Dimensional drawing
- Cable connection diagram
- Plain bearing play
- EU Declaration of Conformity

Warranty

30 months from delivery

Standard tests

- Hydrostatic pressure test with 1.5x nominal pressure
- Balancing of shaft and impeller according to DIN ISO 1940, 6.3
- Leak test of the complete pump

Additional test

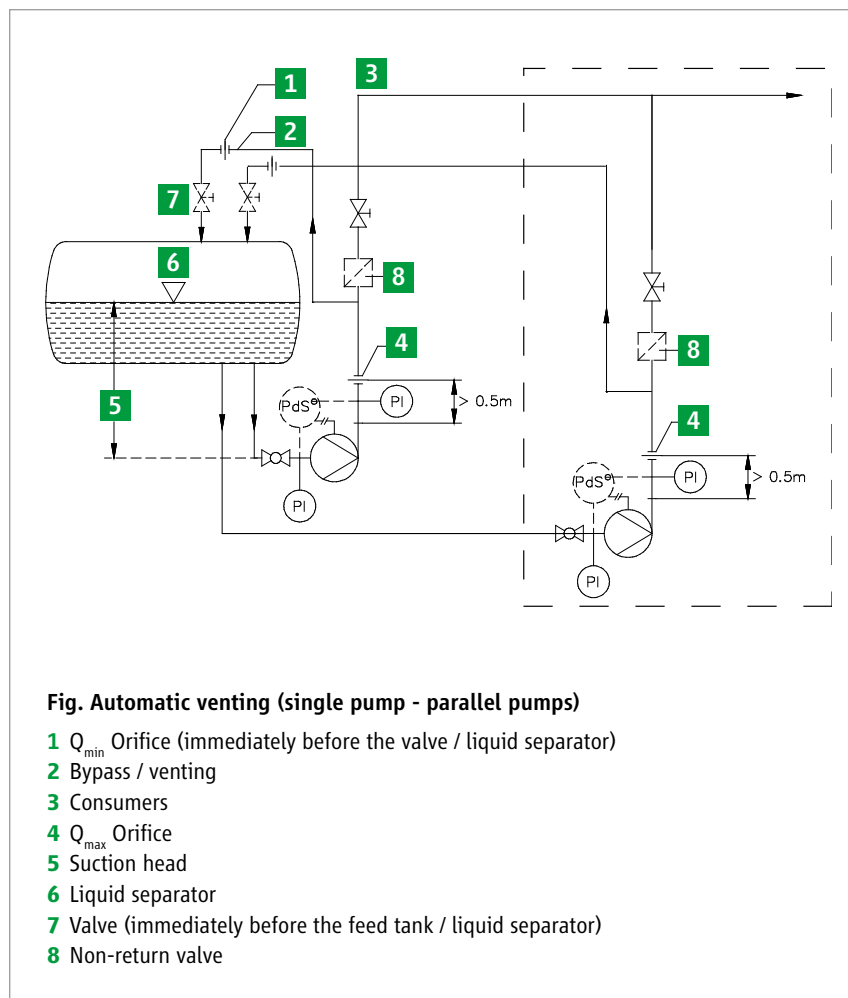
- Factory certificate according to EN 10204 / 3.1 for counter flanges
- Factory certificate according to EN 10204 / 2.2 for impeller and pump shaft
- EUR.1 movement certificate (after examination)

- Table of Contents
- General information
- Function
- Operating principle
- Characteristic maps
- Versions
- List of parts
- Collective measurements
- Documentation and tests
- Installation
- Flow regulation
- Design software
- Contact



Automatic venting

1. Use a non-return valve between the discharge nozzle and gate valve to ensure that the medium does not flow back after switching off the pump.
2. To allow venting, provide a bypass pipe:
 - Ahead of the non-return valve.
 - Please note: do not provide non-return valves in the bypass pipe.
3. For parallel operation:
 - Separate supplies for the pumps
 - Separate bypass pipes



- Table of Contents
- General information
- Function
- Operating principle
- Characteristic maps
- Versions
- List of parts
- Collective measurements
- Documentation and tests
- Installation**
- Flow regulation
- Design software
- Contact



Flow regulator

General information

The flow regulator was specially developed for refrigerant systems. This type of valve allows the safe operation of pumps in a range normally not possible for pumps with $Q_{\max}$ orifice. The adjacent graph shows the added operating range obtained by using a flow regulator instead of a $Q_{\max}$ orifice. Often, a smaller, less expensive pump can be used.

Operation

The flow regulator must be filled with liquid during operation. The operation of the valve depends on the material data of the pumped medium. When ordering the valve, it is therefore important that complete information on the characteristics of the pumped medium in the operating range to be regulated is available. The density of the pumped medium is the most important characteristic for the correct design of a valve.

Maintenance

The flow regulator requires no regular maintenance or readjustment. The valve inserts can be reordered if necessary.

Area of application

The flow regulator is mounted on the discharge branch of the pump. The flow regulator limits the maximum flow rate of the pump. However, in contrast to the $Q_{\max}$ orifice, the flow rate $< Q_{\max}$ is almost equal to the full delivery pressure of the pump behind the valve. The flow regulator regulates the delivery rate to ensure that the maximum pump capacity is not exceeded. This protects the pump from overload and keeps the delivery rate within the optimum NPSH range of the pump.

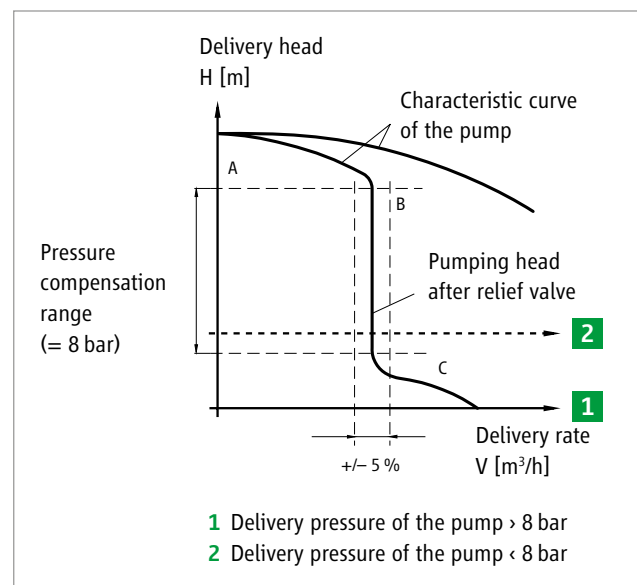


Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

Flow regulation

Design software

Contact



Flow regulator

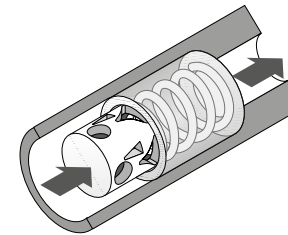
Working principle

The flow restriction is achieved by specially shaped openings in a spring-loaded, movable piston. The pressure difference in front of and behind the piston moves it. This ensures that only the appropriate amount flows through the openings. It follows that with increasing pressure difference, the spring is compressed. This means that the specially shaped openings are only partially released. When the pressure difference in front of and behind the valve decreases, the spring pushes the piston back in line with the changing pressure difference releasing a larger part of the opening. If the pressure difference exceeds the specified maximum value (pressure compensation range, generally 8 bar), the spring is compressed up to the stop, and the valve then works like a fixed orifice. The same applies when the required minimum pressure is not reached.

Functional schematic of the valve

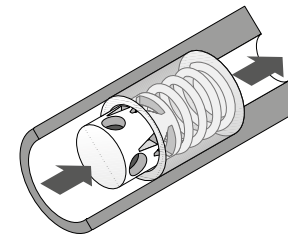
Position A

In position A, the insert works as an orifice. As a result, little pressure is relieved at the valve.



Position B

In the pressure compensation range, the insert limits the maximum volumetric flow rate as a function of the differential pressure with an accuracy of $\pm 5\%$.



Position C

Behind the pressure compensation area, the insert is completely compressed and acts as an orifice.

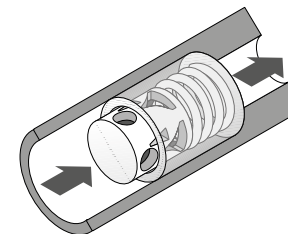


Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

Flow regulation

Design software

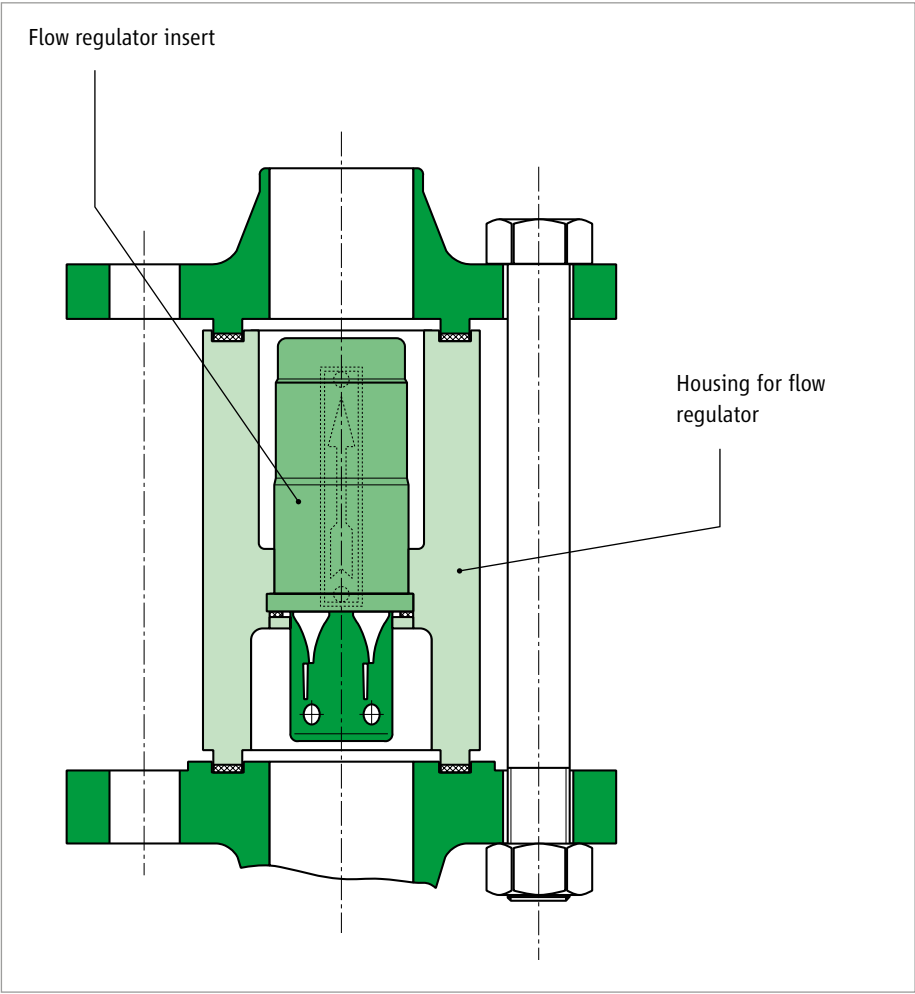
Contact



Flow regulator and list of parts

The valve is available for the following flow rates

Model	Pressure rating	NW	max. flow rate for H ₂ O
32-63-40-10	63 bar	32	10,00 m ³ /h



- Table of Contents
- General information
- Function
- Operating principle
- Characteristic maps
- Versions
- List of parts
- Collective measurements
- Documentation and tests
- Installation
- Flow regulation**
- Design software
- Contact

Design software / services

Online design

The user-oriented design software simplifies the selection of the right refrigerant pump. It is also possible to calculate the energy-saving options with the software. The software-based design for frequency-controlled operation is easily possible. Minimum and maximum speeds and the appropriate operating range are displayed.

Quick registration

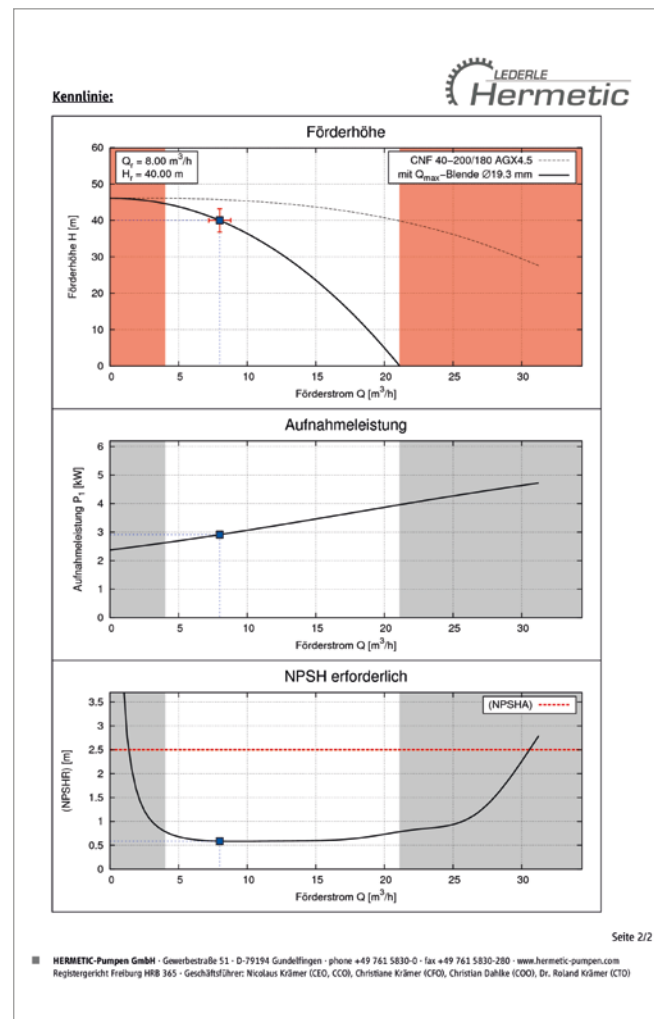
Do you want to know more about the many benefits of our new design software?

Simply register as a new user on our homepage
www.hermetic-pumpen.com

After registration and receiving the access data, you can test the design software free of charge. Registered users simply log in using their access data – a new registration is not required.

Other online services

We provide free 3D CAD models for your planning and your design office.



Example view after pump selection

Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

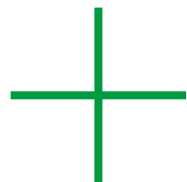
Flow regulation

Design software

Contact



Benefits of the design software



Direct entry of the required refrigeration capacity

Dynamic selection according to power consumption, NPSH

The database contains all common refrigerants

Integration of different pump protection systems, such as $Q_{\max}$ orifice or flow regulator

Design for variable-speed drives

Table of Contents

General information

Function

Operating principle

Characteristic maps

Versions

List of parts

Collective measurements

Documentation and tests

Installation

Flow regulation

Design software

Contact



PRODUCT INFORMATION

Contact

sales-support@hermetic-pumpen.com

www.hermetic-pumpen.com

YouTube | LinkedIn | Expert tool

