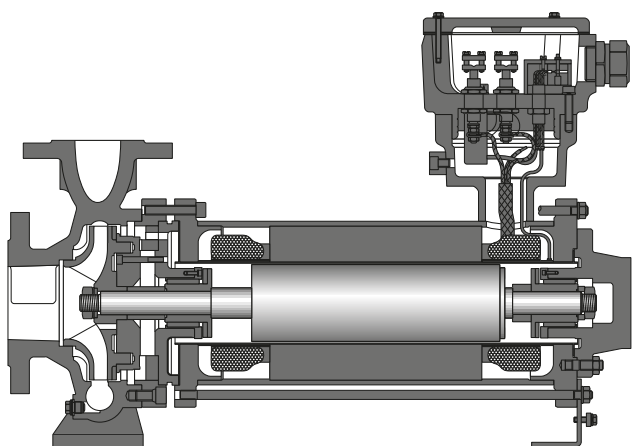


PRODUCT INFORMATION



Single-stage canned motor pumps
complying with the chemical standards
EN 22858; ISO 2858

Model series HCN / HCNF

Contents

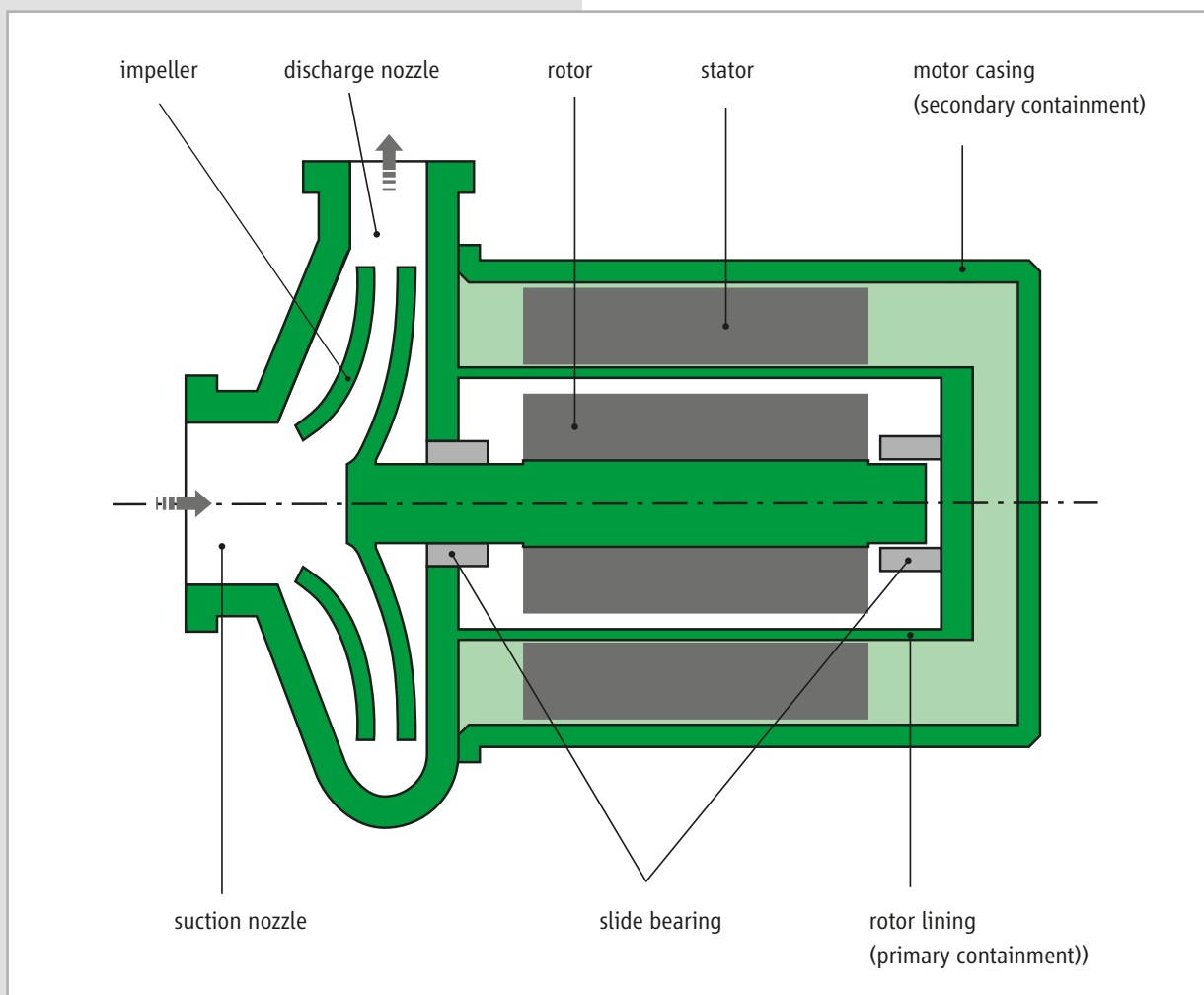
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Description

General

Canned motor pumps are characterised by a compact, integrated unit without mechanical seal. The motor and pump form a unit with the rotor and the impeller fitted onto a common shaft. The rotor is guided by two identical, medium-lubricated slide bearings. The stator on the drive motor is separated from the rotor space using a thin stator liner. The rotor cavity itself, along with the hydraulic section of the pump, create a combined cavity which needs to be filled with pumping medium before commissioning.

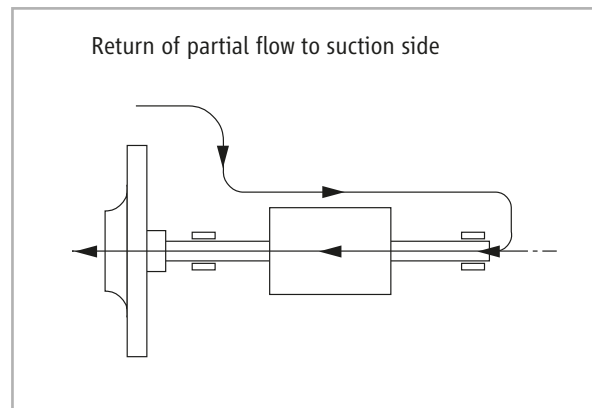
The heat loss from the motor is carried off by a partial flow between the rotor and the stator. At the same time, the partial flow lubricates both slide bearings in the rotor cavity. Both the can, which is a hermetically sealed component, and the motor casing are used as a safety containment. Because of that, canned motor pumps always ensure highest safety level when conveying dangerous, toxic, explosive and valuable media.



Function

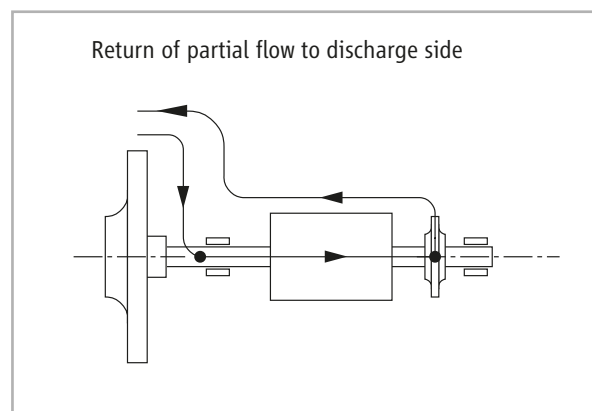
HCN

The partial flow for cooling the motor and lubricating the slide bearings will be branched off at the periphery of the impeller and, after having passed through the motor, is carried back again through the hollow shaft to the suction side of the impeller. This design is suitable for the delivery of uncritical fluids at low vapour pressure values.



HCNF

The partial flow for cooling the motor and lubricating the slide bearings will be branched off at the periphery of the impeller and, after having passed through the motor, is carried back again to the pressure side. An auxiliary impeller serves to overcome the hydraulic losses encountered along the way. The return of the partial flow towards discharge side ensures that the heated motor cooling flow has sufficient pressure reserves over the boiling point curve of the medium during its return to the pump. This model of pump can be used for liquefied petroleum gases with an extremely steep vapour pressure diagram.



Application and insertion

Application sector

HCN

For the delivery of aggressive, toxic, explosive, precious, inflammable, slightly volatile fluids, solvent, etc.

HCNF

Liquid gases, e.g. ammonia, freone, carbon dioxide, amines, propane, butane, vinyl chloride, chlorine, propylene, hydrocarbon etc.

Application ranges

HCN: -120 °C to +120 °C

HCNF: -120 °C to +120 °C

Canned motors

Power: up to 41 kW at 2900 rpm [50Hz]
up to 48 kW at 3500 rpm [60Hz]

Operation: S1 to S10

Voltage: 400 V

Heat class: H – 180

Frequency: 50 or 60 Hz
(plus frequency converter operation
on request)

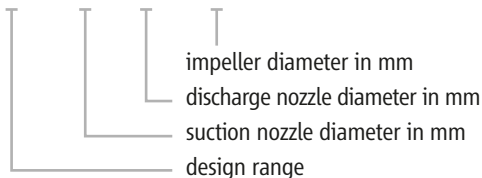
Protection: IP 65

Motor protection: thermistor KL 180

Pump and hydraulic denomination

e.g.

HCN 40 – 25 – 200



Explosion protection

according to EC design test certificate in line with Directive 94/9/EC (ATEX) Ⓜ II 2 G Ex de IIC T3 to T6

Documentation according to HERMETIC-Standard

- operating instructions incl. instructions for commissioning, operation and maintenance
- technical specification
- standard sectional drawing with position numbers
- standard dimensional collection drawing
- spare part list with order numbers
- test certificate
- test performance curve
- EC Declaration of Conformity

Inspections and guarantees

Standard inspections

Hydraulic inspection:

- each pump is subject to a test run and the operating point is guaranteed according to ISO 9906 – class 2 (5 measuring points)
- pressure test
- axial thrust measurement
- leak test

Painting

Painting according to HERMETIC-Standard : thickness 120 ym, 2-layer-coating

Colour: Pantone 355 C (green)

Additional options

- Vapour pressure \geq 5 bar (external by-pass)
- Temperature control via T30 or PT100
- Voltage 690 V star or 500 V delta
- Base plate

Materials and construction size matrix

Materials

VDMA-no.	description	model range HCN / HCNF
		material C
		pressure rating PN 16
wetted parts		
102	valuta casing	1.4408
160	adaptor disc	1.4571
161	distance disc	1.4571
230.01	impeller	1.4408
230.03	auxiliary impeller ⁽¹⁾	1.4581
360	bearing cover	1.4571
381.01	bearing support	1.4571
472.01/02	slide ring	PTFE/K
513	wear ring insert	1.4571
520	reinforcing sleeve	1.4571
525.01	distance sleeve	1.4571
529.01/02	bearing sleeve	1.4571/W5 ⁽²⁾
545.01/02	bearing bush	1.4571/SiC30
816	stator can	Hastelloy C4
817	rotor lining	1.4571
819	motor shaft	1.4571
921/922	shaft nut / impeller nut	1.4571
non-wetted parts		
811	motor casing	1.0037
812	motor casing cover	1.0460

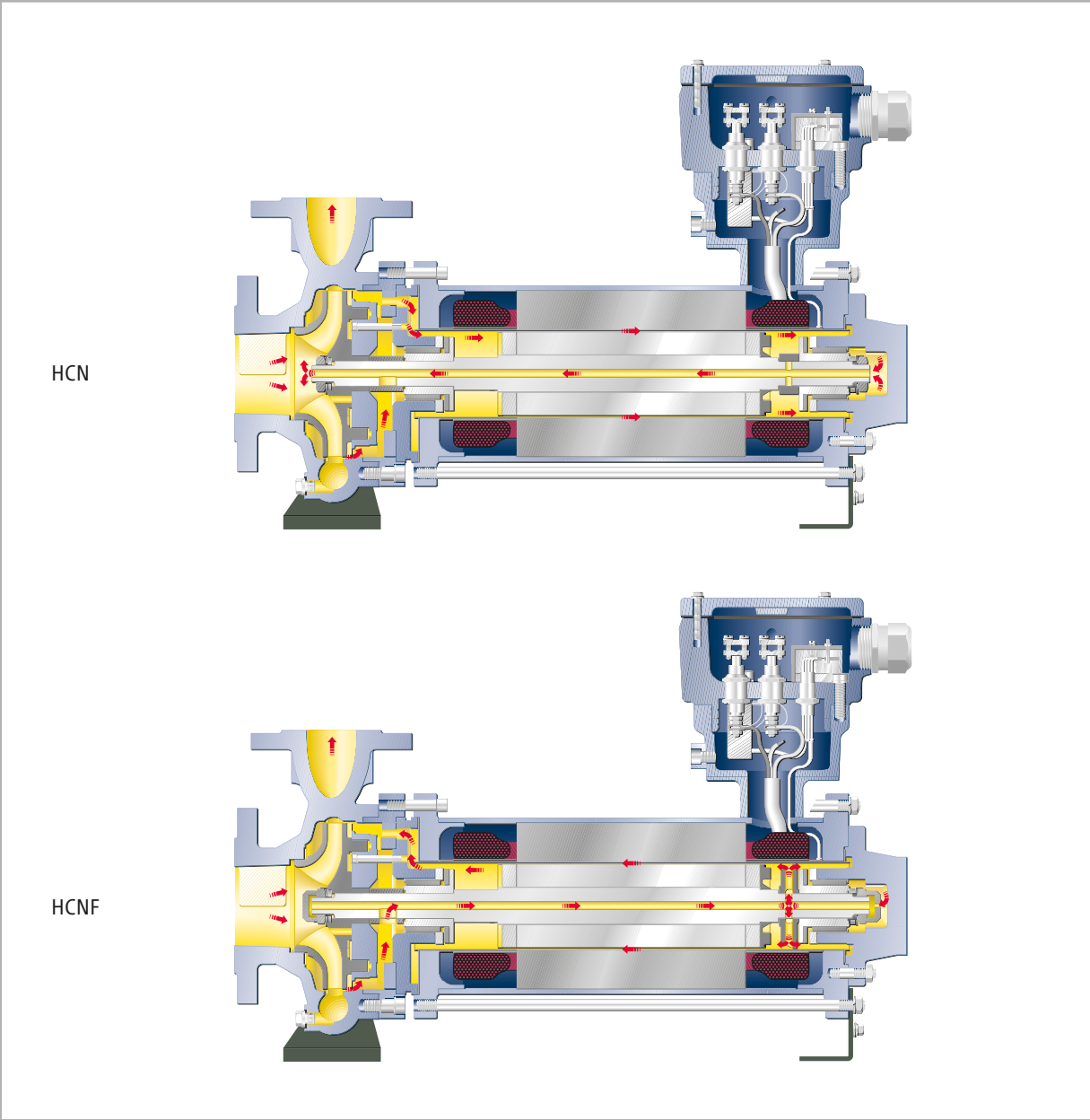
(1) parts only for HCNF

(2) denotes Tungsten carbide coating

Construction size matrix

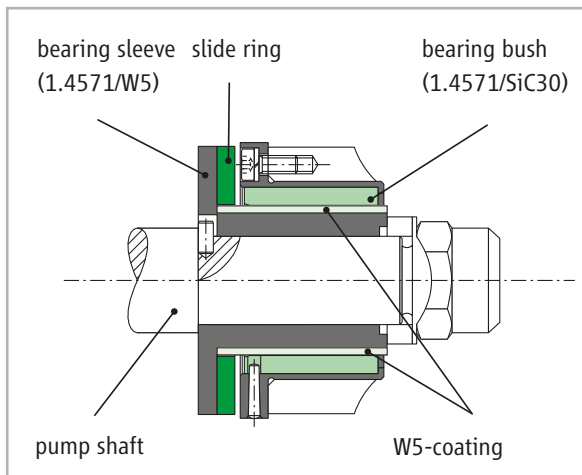
Hydraulic	Motors 400 V delta				
	N24N-2	N34L-2	N34XL-2	N54XL-2	N64XL-2
HCN / HCNF	max. 6,0 kW	max. 8,0 kW	max. 14,8 kW	max. 24,0 kW	max. 41,0 kW
40-25-200					
65-40-160					
65-40-200					
80-50-160					
80-50-200					
80-50-250					
100-65-200					
100-65-250					
125-80-200					

Functional principle



Bearing arrangement

The bearing in hermetically designed pumps must be located and immersed in the operating liquid. Therefore, in most cases, only the use of hydrodynamic slide bearings is required. The correct operating method ensures the advantage that no contact may be created between the bearing lining. Thus, they are constantly running free from wear and maintenance. Service life of 8 to 10 years can be easily achieved by using HERMETIC pumps.

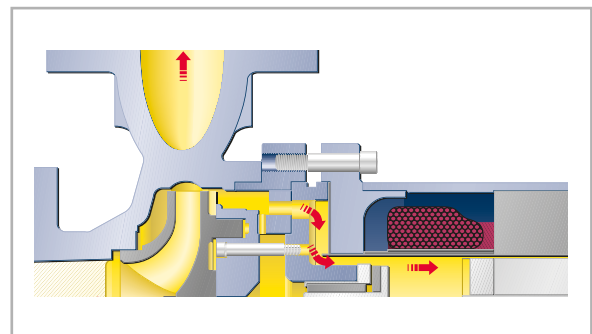


The almost universal bearing combination based on tungsten carbide (W5) and silicon carbide (SiC30) has to be proved to be the best choice. These combinations consist of metallic shaft sleeves made of stainless steel (1.4571) and coated by tungsten carbide according to the "High Velocity Oxygen Fuel Procedure". Furthermore, they consist of a firm bearing bush made of ceramic material (SiC30) that is surrounded by a sleeve made of stainless steel. SiC30 is a mixed material of silicon carbide and graphite, combining the product advantages of both materials. Conditions of mixed friction, as they may arise for example during start-up and stopping phase of pumps, can be easily handled with SiC30. Moreover, this material is deemed to be thermal shock resistant (high resistance against changes in temperature), as well as chemically stable and blister resistant (no formation of bubbles at material surface) and abrasion resistant.

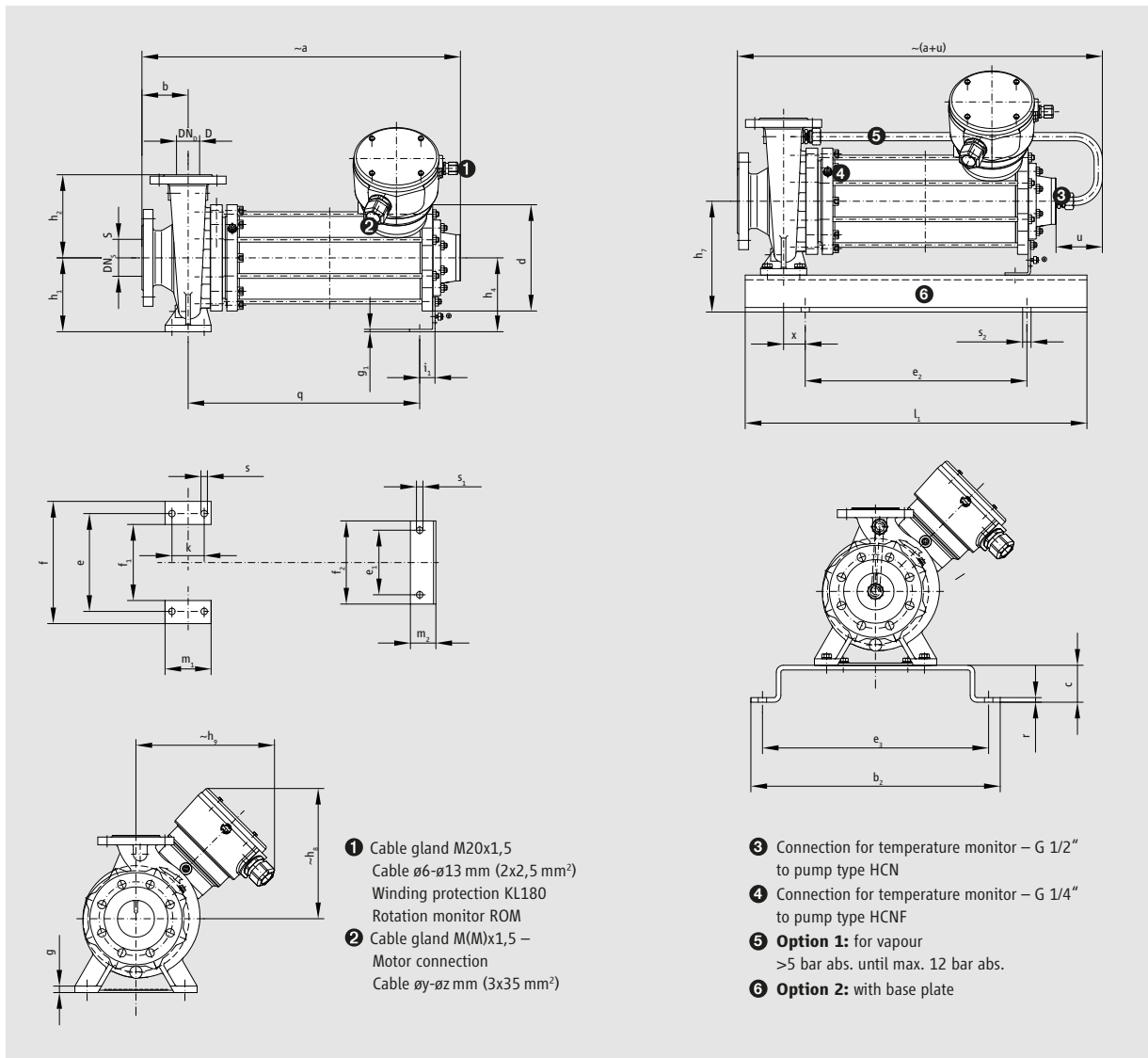
Axial thrust balancing

The development of HERMETIC pump systems depended on the solution of a central problem, namely the elimination of axial thrust at the rotor equipment. The various fluid properties exclude the possibility of using mechanical axial bearings. The only generally valid solution to this problem thus lay in hydraulic balance of the rotor.

The functional principle of the hydraulic balancing device of range HCN / HCNF is based on the combination of a firm throttling device (labyrinth clearance) to the outer diameter of the impeller and a variable throttle in the range of the impeller hub. According to the axial position of the rotor, the pressure within the pressure compensation chamber is changed due to the valve effect of the variable throttling clearance. Therefore, it works against the axial thrust of the impeller. The pressure on backside of the impeller consequently changes due to the axial position of the rotor. The axial position of the pump shaft is automatically regulated during operation in order that a balanced condition is created by itself and thus, there are no effects by axial forces on the axial bearing collar.



Dimensional drawings



Dimensions of pump														Weight
Model	DN _s	DN _o	b	e	f	f ₁	g	h ₁	h ₂	i	k	m ₁	s	kg
40-25-200	40	25	80	190	240	140	14	160	180	35	70	100	14	28
65-40-160	65	40	80	190	240	140	14	132	160	35	70	100	14	26
65-40-200			100	212	265	165	14	160	180	35	70	100	14	31
80-50-160	80	50	100	212	265	165	14	160	180	35	70	100	14	26
80-50-200			100	212	265	165	14	160	200	35	70	100	14	33
80-50-250			125	250	320	190	16	180	225	47,5	95	125	14	50
100-65-200	100	65	100	250	320	190	16	180	225	47,5	95	125	14	42
100-65-250			125	280	360	200	18	200	250	60	120	160	18	53
125-80-200	125	80	125	280	345	215	16	180	250	47,5	95	125	14	52

Dimensions of motor										Weight
Motor type	d \varnothing	e ₁	f ₂	g ₁	h ₈	h ₉	s ₁	M	Cable \varnothing y- \varnothing z	kg
N 24 N	230	140	180	5	240	265	11.5	25x1.5	12-17	60
N 34 L	230	140	180	5	240	265	11.5	25x1.5	12-17	82
N 34 XL	230	140	180	5	285	300	11.5	40x1.5	17-28	123
N 54 XL	270	170	210	6	295	310	13.5	40x1.5	17-28	204
N 64 XL	320	210	250	6	320	330	13.5	40x1.5	17-28	290

Dimensions of base plate										Material RSt 37-2	Weight
Motor type	b ₂	c	e ₂	e ₃	x	l ₁	r	s ₂	u	Model-no.	kg
N 24 N	450	80	420	400	40	660	10	18	75	660x450x80	30
N 34 L	450	80	420	400	–	660	10	18	75	660x450x80	30
N 34 XL	540	80	480	490	–	740	10	18	75	740x540x80	38
N 54 XL	540	80	540	490	27	800	10	18	100	800x540x80	42
N 64 XL	540	80	640	600	25	900	10	18	100	900x540x80	48

Additional dimensions depending on motor size																			
Model	N 24 N						N 34 L						N 34 XL						
	a	h ₄	h ₇	i ₁	m ₂	q	a	h ₄	h ₇	i ₁	m ₂	q	a	h ₄	h ₇	i ₁	m ₂	q	
40-25-200	554	160	240	33	55	366													
65-40-160							575	132	212	33	50	407	670	132	212	33	50	502	
65-40-200							595	160	240	33	55	407	690	160	240	33	55	502	
80-50-160							595	160	240	33	55	407	690	160	240	33	55	502	
80-50-200							595	160	240	33	55	407	690	160	240	33	55	502	
80-50-250																			
100-65-200																			
100-65-250																			
125-80-200																			
Model	N 54 XL						N 64 XL												
	a	h ₄	h ₇	i ₁	m ₂	q	a	h ₄	h ₇	i ₁	m ₂	q							
40-25-200																			
65-40-160																			
65-40-200																			
80-50-160																			
80-50-200	821	160	240	30	50	609													
80-50-250	856	180	260	33	60	617													
100-65-200	831	180	260	33	60	617													
100-65-250							932	200	280	35	55	690							
125-80-200							932	180	260	35	55	690							

Monitoring systems

The most part of HERMETIC pumps are designed according to explosion protection requirements. The pumps comply with the requirements of the electrical as well as mechanical explosion protection.

Level monitoring

On condition that the rotor cavity as part of the process system is steadily filled with liquid, no explosive atmosphere may arise. In this case, no accepted explosion protection is required for the rotor cavity. If the operator is not able to guarantee for a steady filling, it is necessary to install level monitoring devices.

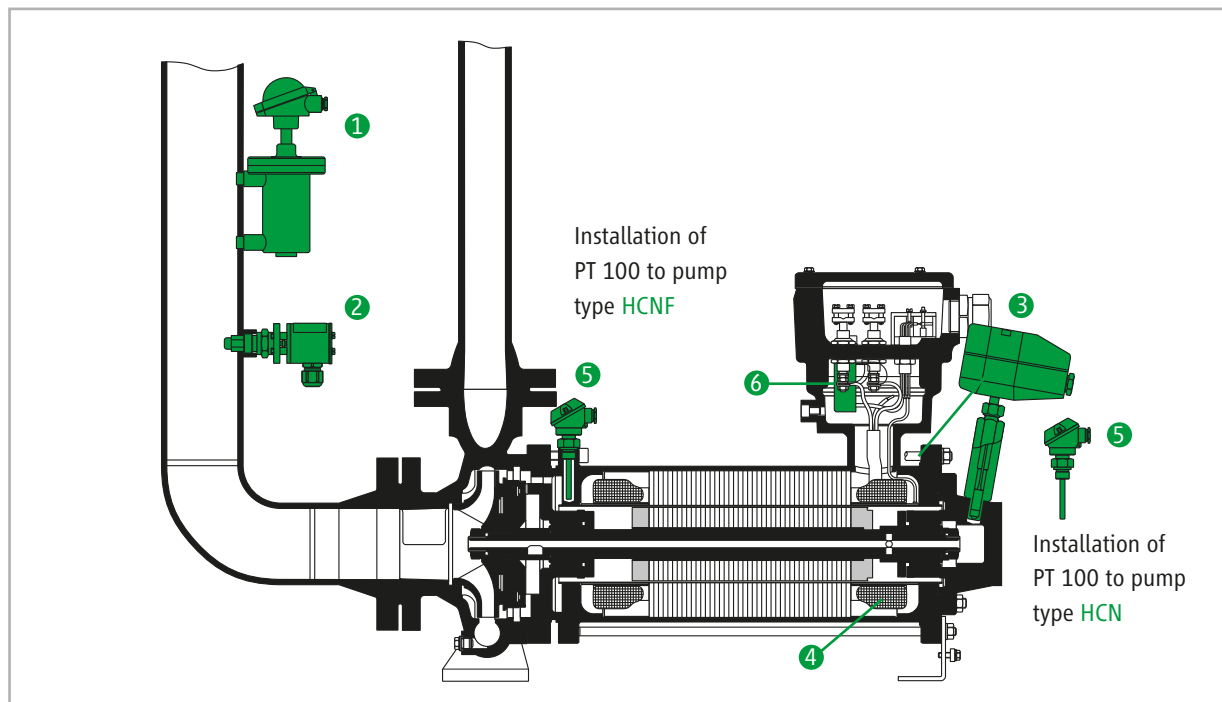
Temperature monitoring

The observance of the temperature class and the maximum admissible surface temperature of the canned motor, respectively, is ensured via thermistor in the stator winding and/or via a measuring point on the bearing cover (liquid temperature).

Monitoring of rotating direction

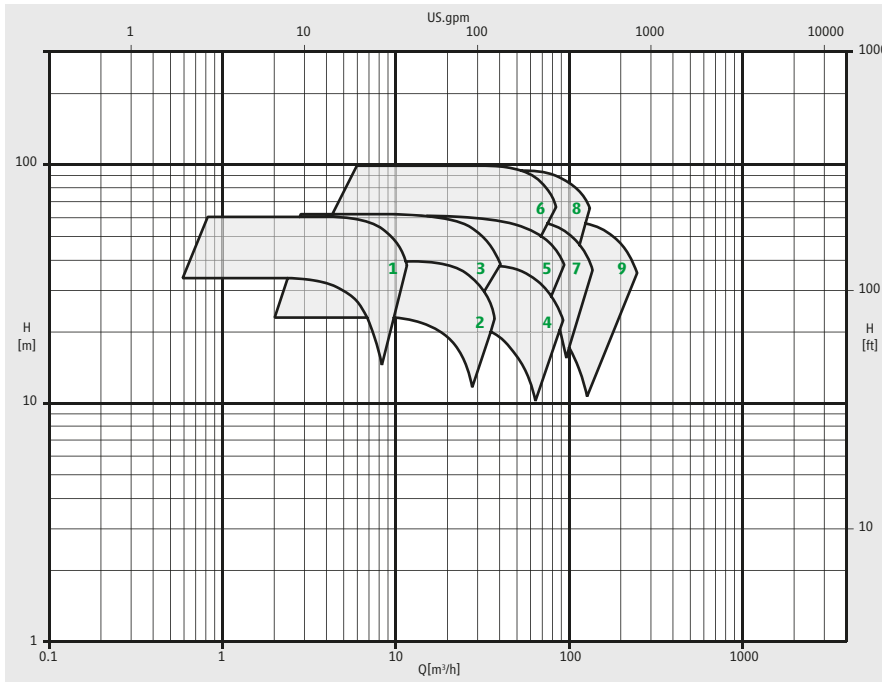
The specified rotating direction of the motor must be absolutely observed for a proper operation of a canned motor pump in order to prevent damages. HERMETIC pumps are axial hydro-dynamically balanced aggregates. Thus, there are no axial forces being created during proper operation. Any deviating rotating direction of the pump does not only result in a lower pressurization that is created by the impeller, but it is also able to influence the axial thrust balancing negatively and it may cause damages in the pump within a short time. This is the reason why all pumps of type range HCN / HCNF are equipped with an integrated phase monitoring which is connected in series with the winding protection (Thermistor KL180) and which interrupts the signal sent by the Thermistor when a wrong rotating field is reached. Thus, it is prevented that the pump is started at a deviating rotating direction.

various monitoring devices			
①	Type N 30	LS	level
②	Type O 30	LS	
③	Type T 30	TS	temperature
④	Type KL 180	TS	
⑤	Type PT 100	TI	
⑥	Type ROM	GI	direction of rotation



Characteristics diagram

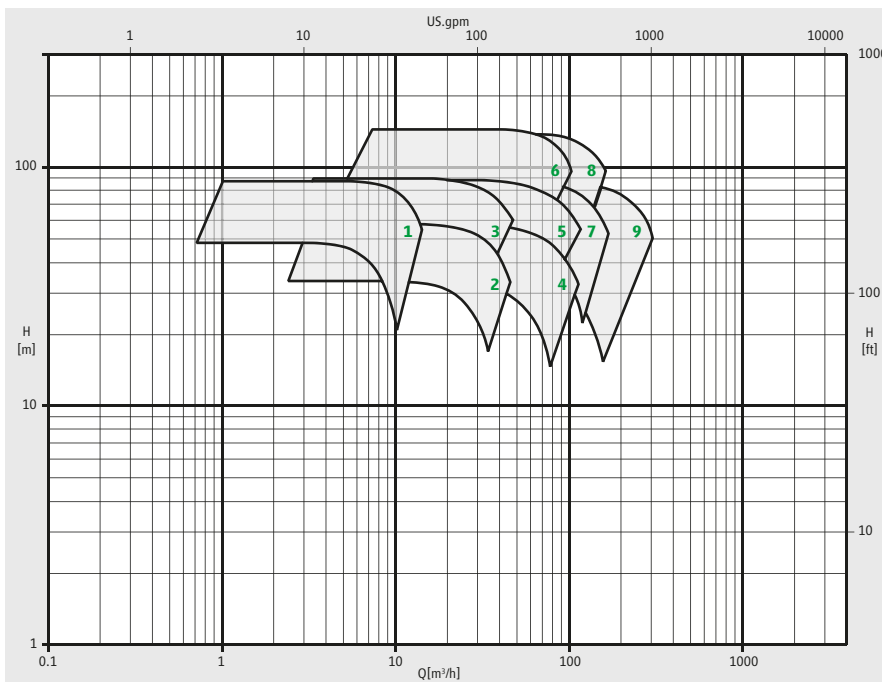
Characteristics diagram 2900 rpm 50 Hz



Denomination of hydraulics to the characteristics diagram

- 1** 40-25-200
- 2** 65-40-160
- 3** 65-40-200
- 4** 80-50-160
- 5** 80-50-200
- 6** 80-50-250
- 7** 100-65-200
- 8** 100-65-250
- 9** 125-80-200

Characteristics diagram 3500 rpm 60 Hz



Denomination of hydraulics to the characteristics diagram

- 1** 40-25-200
- 2** 65-40-160
- 3** 65-40-200
- 4** 80-50-160
- 5** 80-50-200
- 6** 80-50-250
- 7** 100-65-200
- 8** 100-65-250
- 9** 125-80-200

Convincing service.

Important features are readiness, mobility, flexibility, availability and reliability. We are anxious to ensure a pump operation at best availability and efficiency to our customers.

Installation and commissioning

- service effected on site by own service technicians

Spare part servicing

- prompt and longstanding availability
- customized assistance in spare part stockkeeping

Repair and overhauling

- professional repairs including test run executed by the parent factory
- or executed by one of our service stations worldwide

Retrofit

- retrofit of your centrifugal pumps by installing a canned motor to comply with the requirements of the IPPC Directive

Maintenance and service agreement

- concepts individually worked out to increase the availability of your production facilities

Training and workshops

- extra qualification of your staff to ensure the course of your manufacture

Among others, our products comply with:

- Directive 2006/42/EC (Machinery Directive)
- Explosion protection acc. to Directive 94/9/EC (ATEX); UL; KOSHA; NEPSI; CQST; CSA; Rostechnadzor
- Directive 96/61/EC (IPPC Directive)
- Directive 1999/13/EC (VOC Directive)
- TA-Luft
- RCC-M, Niveau 1, 2, 3

HERMETIC-Pumpen GmbH

is certified acc. to:

- ISO 9001:2008
- GOST; GOST "R"
- Directive 94/9/EC
- AD 2000 HP 0; Directive 97/23/EC
- DIN EN ISO 3834-2
- KTA 1401; AVS D 100 / 50; IAEA 50-C-Q
- Certified company acc. to § 19 I WH

PRODUKTINFO
HCN-HCNF/E/07/2010

All details as stated in this document comply with the technical standard that is applicable at the date of printing. These details are subject to technical innovations and modifications at any time.



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