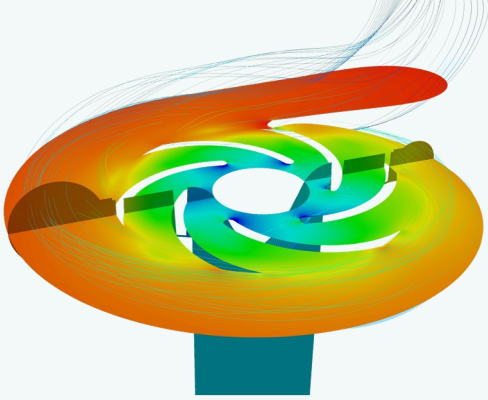
miksan MOTOR

H SERIES

MULTISTAGE PUMPS CATALOGUE



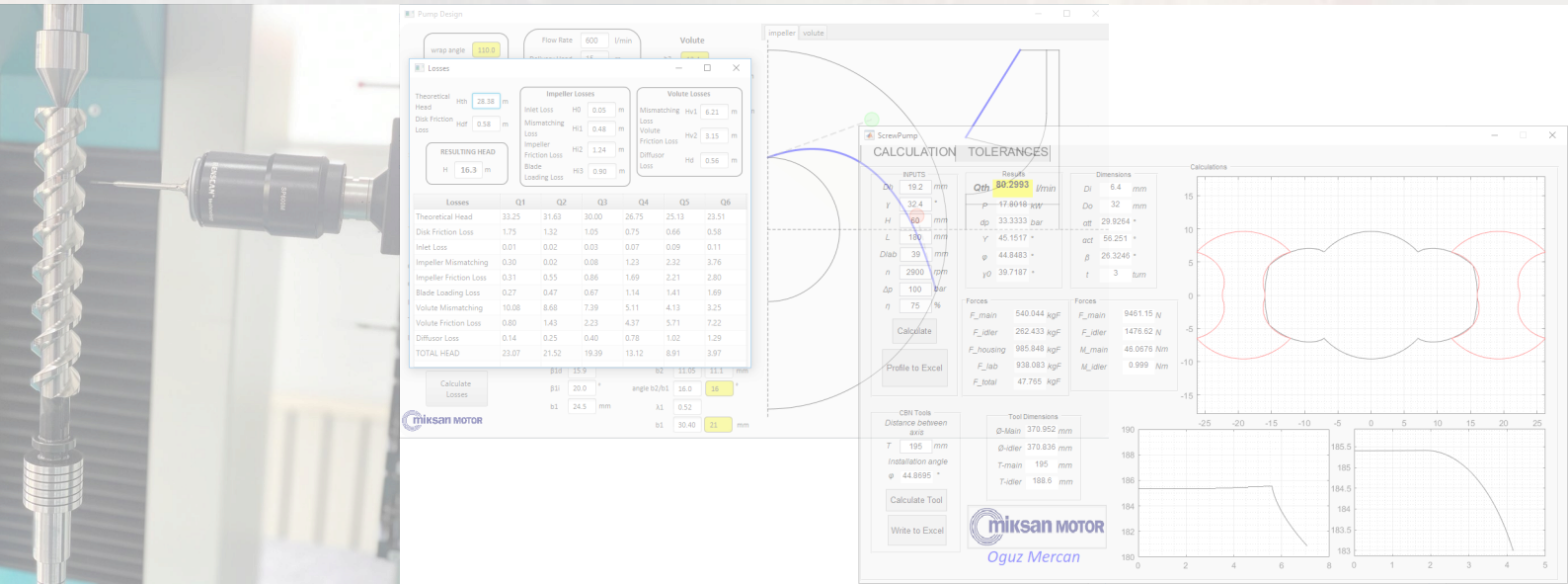
R&D

Our company continues its pioneering role in production of immersion pumps for domestic market. The R&D studies for immersion pumps used for the circulation of the coolant and cutting fluids have been progressively increased. In recent years, R&D department of the company is equipped with the up-to-date engineering tools. As a result of R&D studies, the new types of immersion pumps with high efficiency are designed, manufactured and added to our product range. All the detailed performance characteristics of the immersion pumps can be performed and reported in our company.

The use of high efficiency pumps, with modular mechanical structure, designed and produced in recent years, decreases the cost of life time maintenance and operation. Miksan Motor has it's own software for hydraulic design calculations of impeller, diffuser, volute and screw spindles.

About Us

Miksan Motor Sanayi ve Ticaret A.Ş. was founded in Istanbul in 1977 for producing electric motors. We began manufacturing immersion pumps to meet domestic market demand in 1982. Currently, within the area of 9000 m^2, we produce immersion pumps for machine tools, electrical motors, the electric motors for special applications with specially designed shaft and flange, explosion-proof electrical motors, and vibrators. Our products meet all the requirements of the related IEC, ISO, DIN and TSE standards. We offer high quality products by increasing our production capacity, improvement in distribution and decrease in delivery time significantly.



H SERIES HIGH PRESSURE PUMPS

H series pumps are closed impeller, multistage pumps and they are used for middle and high pressure pumping applications in industry extensively. Pump pressure can be raise from 1 bar to 25 bar due to multistage pump construction. When the pumps work as serial it possible to reach higher pressure.

The main applications of the high pressure pumps;

- CNC lathes,
- CNC machining centers,
- Especially deep hole boring operations,
- Erosion machines,
- Washing processes,
- Cooling systems.

Immersion depth of the high pressure pumps depend on stage quantity. It can be extended by using empty stages.

For example;
Immersion depth of HCB 10 pump is 291 mm but immersion depth of extended type HCB 25/10 is 606 mm (Please contact us for more details).

HCB, HDB, HEB and HFB type pumps are mostly used at deep hole boring applications on CNC machine tools. On deep hole boring applications, while work piece are drilled by cutting tool, coolant liquid are sprayed to the work piece get through from cutting tool. So work piece and cutting tool can be cold, metal chips can be thrown out via threads of the drilling tool. High pressure pumps work against the high piping resistance so they increase machining quality and life of the cutting tools.

High pressure pumps' impellers and diffusers are made of stainless steel (AISI 304) so they have a good chemical resistance against to various chemical liquids. There are O-rings on the diffusers for reaching high pressure and preventing back flow to maintain high efficiency. O-rings are made of Viton for high chemical resistance.

Mechanical Seal

Mechanical seals are consist of four parts. These parts are; stable part, rotary part, bellows and spring. Mechanical seal materials must be choose according to liquid specifications and pump application type. These materials are shown on table 1.

Components	Type 1	Type 2
Stable Part	SiC	TC
Rotary Part	C	TC
Bellows	Viton	
Spring	Stainless steel	

Table 1 - Materials of the mechanical seals

SiC : Silicon Carbide
TC : Tungsten Carbide
C : Resin-Impregnated Carbon
V : Viton (FKM)

H series multistage pumps are offered in various flow rate and pressure, combination with various options can be possible as shown below.

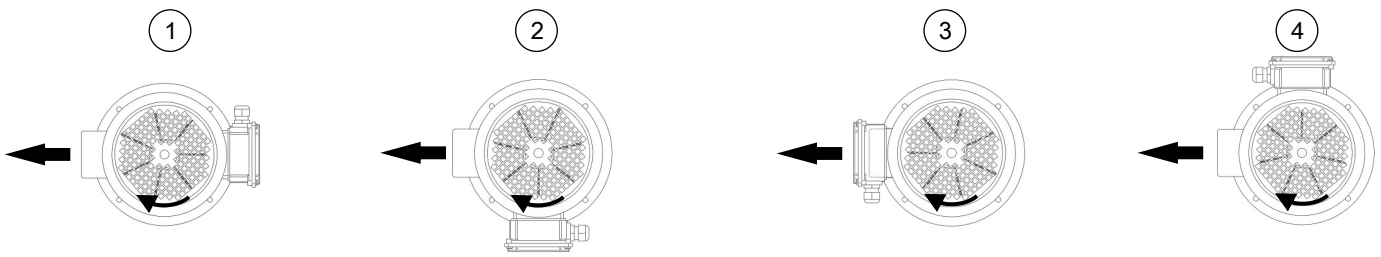
HCB 20 / 15

Pump Type
Number of Stages
Number of Impellers

Frequency / Voltage

- 230 / 400 V 50 Hz (Standard)
- 265 / 460 V 60 Hz (Reduced number of impeller)
- 230 / 400 V 50 Hz - 265 / 460 V 60 Hz (Increased Motor Power)
- Customized Frequency and Voltage (Customized Winding)

Terminal Box Positions



1 – Opposite of pump discharge

2 – On the left of pump discharge (Standard for vertical pumps)

3 – Same direction of discharge (Standard for HC/HD)

4 – On the right of pump discharge

Grinding Applications

If H series pumps will be used on grinding applications or filtration systems for pumping metal chip containing liquids, TC mechanical seals must be chosen. Because TC has a good mechanical resistance against to metal chips. So the pump can work without any problem.

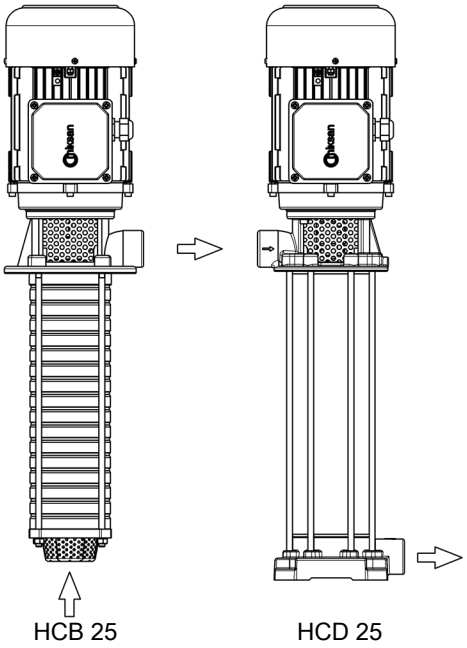
Another important point is that O-ring is not used on the diffuser for these applications. Because metal dusts are abrasive so they can damage to O-rings.

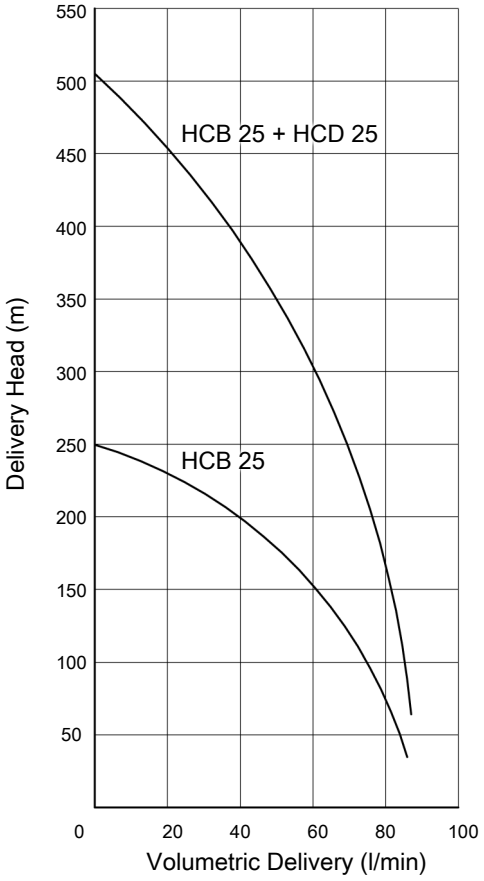
Because of these reasons, H series pumps are produced without O-rings. So delivery head of the pump will be decrease and it must be considered on pump selection.

Delivery heads decrease rates are;

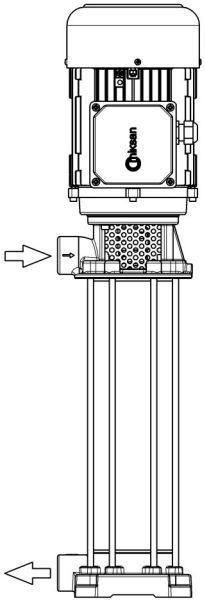
HC / HCA / HCB Pumps : % 17
HD / HDA / HDB Pumps : % 14
HEB/ HFB Pumps : % 12

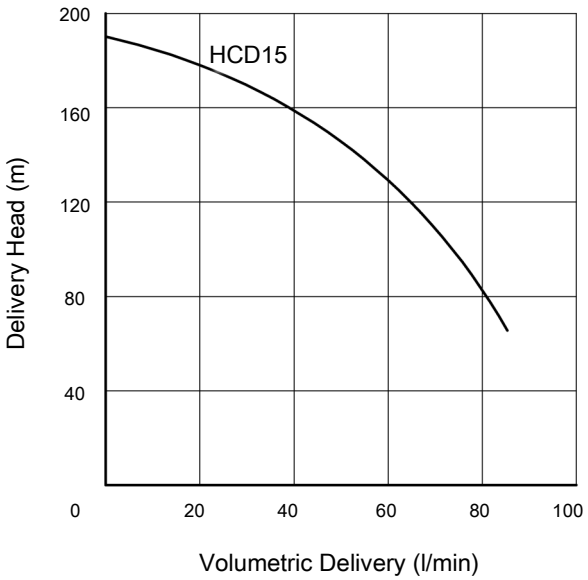
Serial Connection of H Series Pump





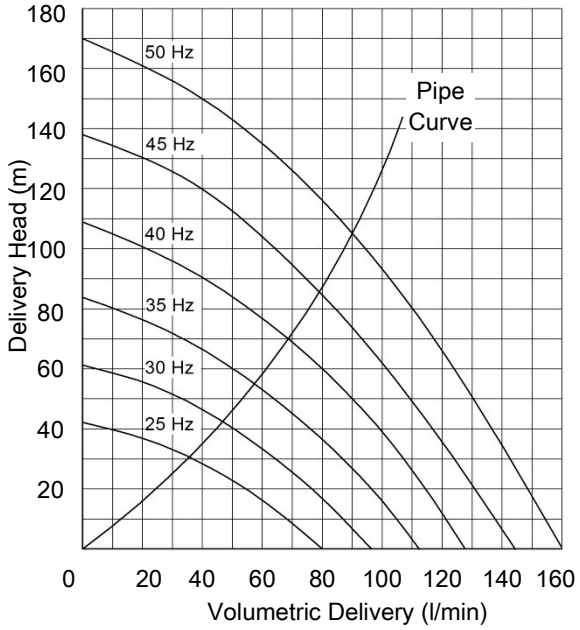
With +4 Bar of Positive Head





Speed Control

It is possible to use our pumps with a frequency converter. The performance curves of the pumps in this catalogue are given for the frequency of 50 Hz. Pump performance curves changes with the rotational speed of the impeller. This is generally done with the use of frequency converter. This makes the operating region of the pump larger shown in figure below.



In case of systems with many pumps, the optimization of the operating points of pumps can be found by using the frequency converters through the control system for energy saving. In this case feedback can be provided by measuring the H and Q values of the each pump continuously.

The advantages of the use of frequency convertor in the driven unit of the pumps are given in the following:

- Frequency converter runs with the fixed voltage to frequency ratio. Thus, current of motor becomes constant. Hereby, the current of the motor will not reach excessive values and therefore the energy losses will decrease.
- For the systems with variable flow rate, the use of frequency convertor can provide energy saving.
- Frequency converters enable to increase the speed of the pump above the nominal values, so pump can be operated above the nominal Q-H curve.
- Frequency convertors provide the flexibility to the system.
- Frequency convertors provide the soft starting for the driving unit.

Motor Protection via PTC and Thermistor

Resistance of PTC temperature sensors that are placed inside the winding, varies depending on the temperature. Ends of the PTC's have to be connected to Thermistor relay. They halt the motor if the temperature of winding exceeds the limit of 130°C. The resistance of PTC increases after the nominal temperature and stops the motor by switching off the circuit.

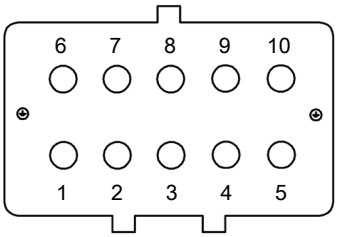
Miksan Motor A.S. electric motors have F class isolation that allows a raise of 80°C in winding temperature at maximum ambient temperature of the 40 °C.

Special Connections

There are some improvements in electrical connections of the coolant pumps used in machine tools according to EN ISO 23570-3:2009.

Electricity can be provided to motor via multi-pin connector on the terminal box according to the standard mentioned above. Also connection of the pins is described in the standards.

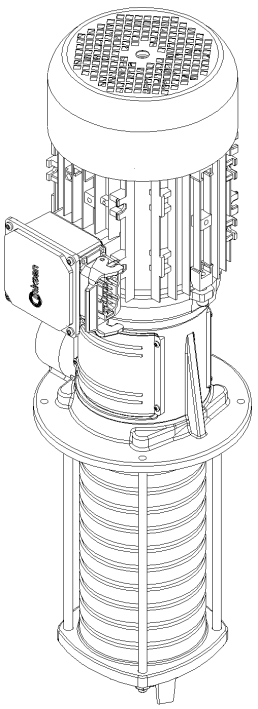
Our pumps provide the connector coupled with motor on request. Male pin connector is assembled on motor and connection of the pin ends is shown in figure below.



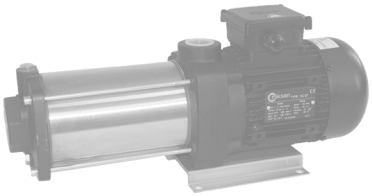
Male Connector Pin Ends

Socket	Motor
1	U1
2	V1
3	W1
6	W2
7	U2
8	V2
4	PTC
9	PTC

Pins of 5, and 10 are left empty for motor brake. Star or delta connections are done by female connector. If motor is star connected, 6, 7, 8 pins are bridged, else if motor is delta connected, 1-6, 2-7, 3-8 pins are bridged.



Connector and Pump Assembly



HC PUMP

Applications:

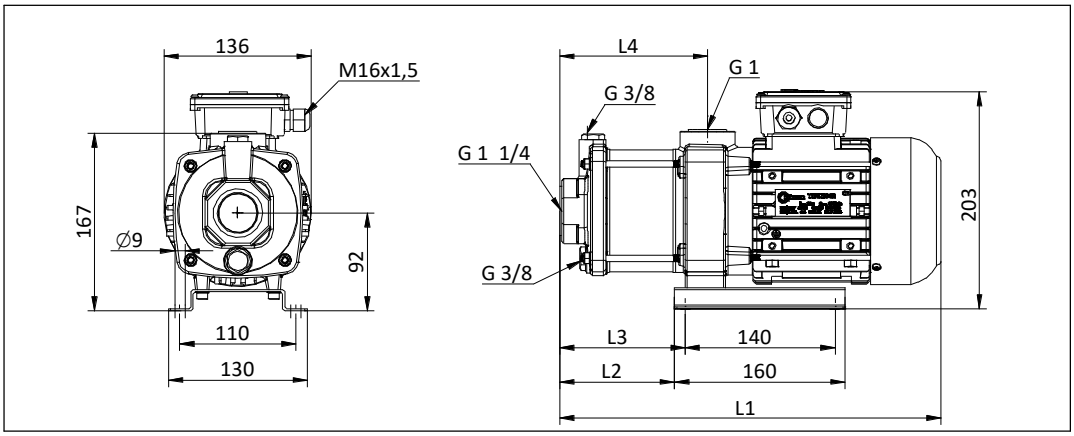
- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Erosion machines,
- Circulation systems. HC Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Inlet body	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Stage cover	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor - 2 pole, Protection degree IP 55



DIMENSIONS & NOMINAL VALUES

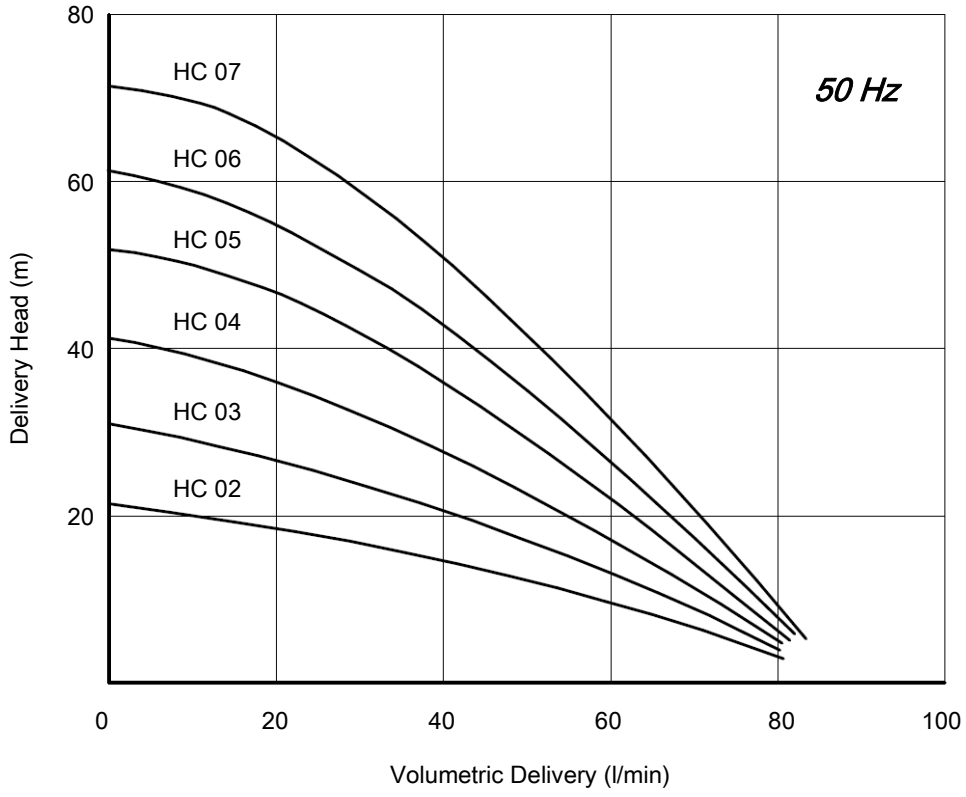
TYPE	L4	L3	L2	L1	Weight	Power	Voltage	Frequency	Rated current	Speed
	mm				kg	kW	V(△Y)	Hz	A	rpm
HC 02	137	116	106	356	11.8	0.37	230/400	50	1.84/1.05	2790
HC 03	158	137	127	377	13.1	0.55			2.25/1.3	2780
HC 04	179	158	148	398	15.0	0.75			3.12/1.8	2820
HC 05	200	179	169	419	15.1	0.90			4.85/2.1	2800
HC 06	221	200	190	440	15.3	0.90			4.85/2.1	2800
HC 07	242	221	211	461	15.5	1.10			4.85/2.8	2720

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HC 07 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HCA PUMP

Applications:

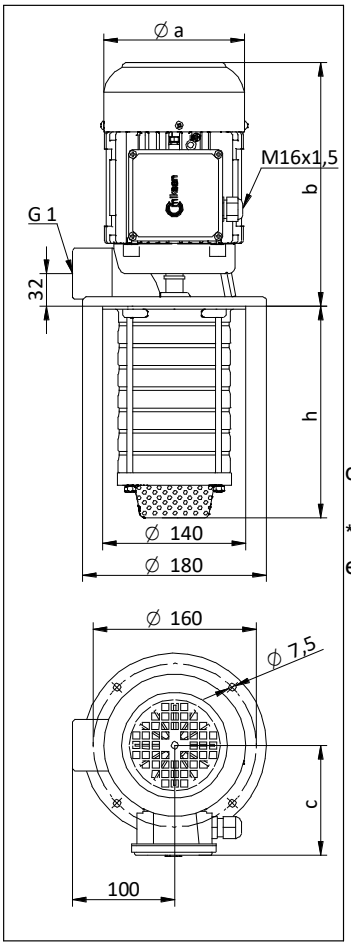
- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Erosion machines,
- Circulation systems. HC Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Stage cover	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor - 2 pole, Protection degree IP 55



DIMENSIONS & NOMINAL VALUES

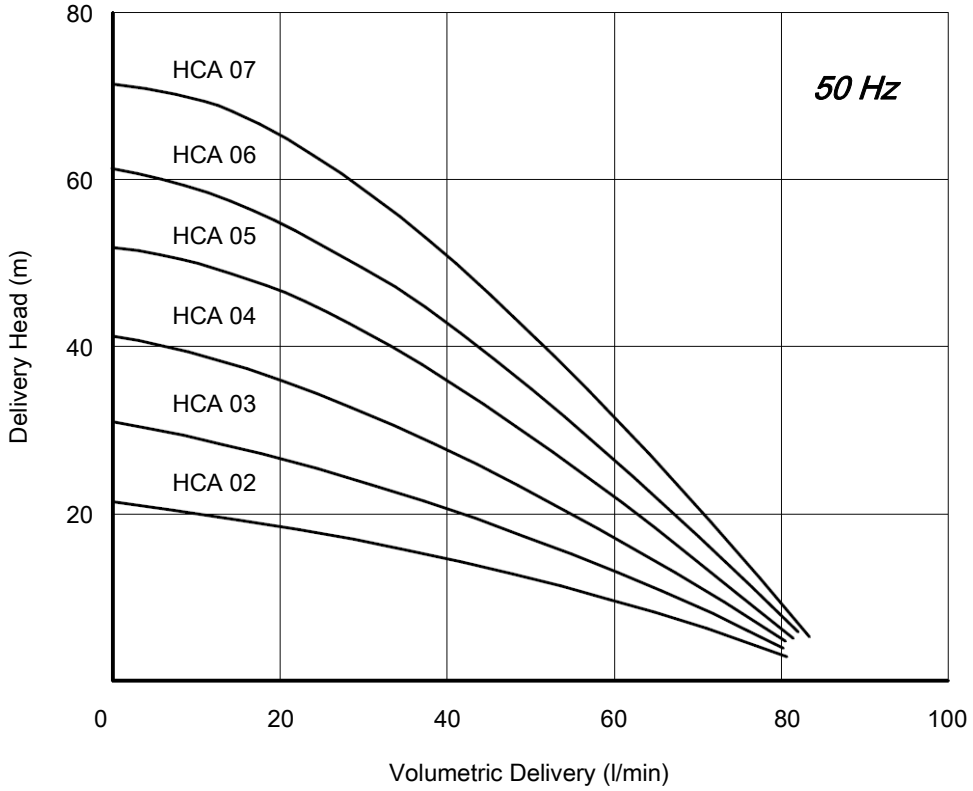
TYPE	Depth of immersion h (mm)	a	b	c	Weight	Power	Voltage	Frequency	Rated current	Speed
		mm			kg	kW	V(Δ/Y)	Hz	A	rpm
HCA 02	143	138	240	111	10.1	0.37	230/400	50	1.84/1.05	2790
HCA 03	143				11.4	0.55			2.25/1.3	2780
HCA 04	164				13.3	0.75			3.12/1.8	2820
HCA 05	185				13.6	0.90			4.85/2.1	2800
HCA 06	206				13.8	0.90			4.85/2.1	2800
HCA 07	227				14.0	1.10			4.85/2.8	2720

* The performance curves are based on 1 mm2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HCA/07 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HCB PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HCB Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

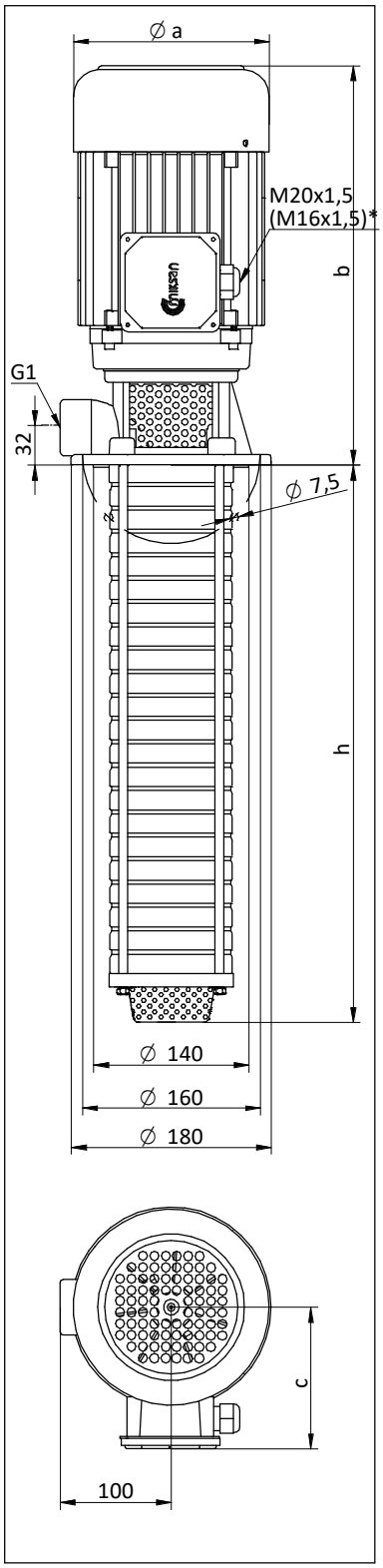
Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M16x1,5 cable gland is used on HCB/06 and HCB/08 pumps.

** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

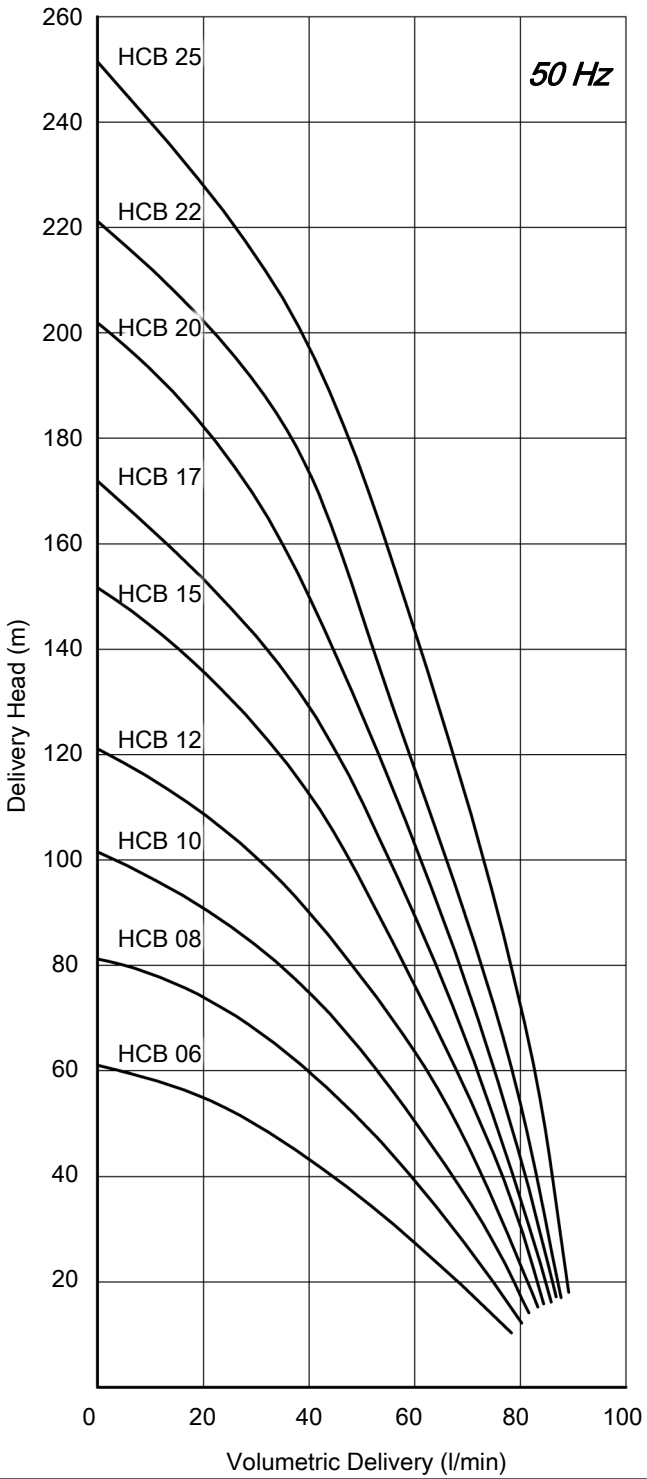
*** Curve tolerance according to ISO 9906:2012 Grade 3B.

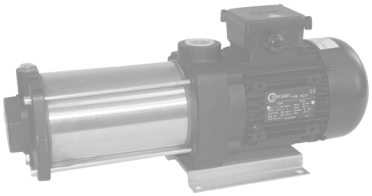


DIMENSIONS & NOMINAL VALUES

TYPE	Depth of immersion h (mm)	a	b	c	Weight	Power	Voltage	Frequency	Rated current	Speed
		mm			kg	kW	V(Δ/Y)	Hz	A	rpm
HCB 06	206	157	319	118	17.0	1.1	230/400	50	4.3/2.5	2890
HCB 08	248	157	319	118	17.5	1.1			4.3/2.5	2890
HCB 10	291	176	365	139	25.0	2.2			7.79/4.5	2905
HCB 12	333	176	365	139	25.5	2.2			7.79/4.5	2905
HCB 15	396	194	397	150	33.0	3.0			10.4/6.0	2905
HCB 17	438	194	397	150	33.5	3.0			10.4/6.0	2905
HCB 20	501	194	397	150	37.0	4.0			13.3/7.7	2900
HCB 22	543	194	397	150	37.5	4.0			13.3/7.7	2900
HCB 25	606	194	397	150	39.5	4.0			13.3/7.7	2900

Performance Curve





HD PUMP

Applications:

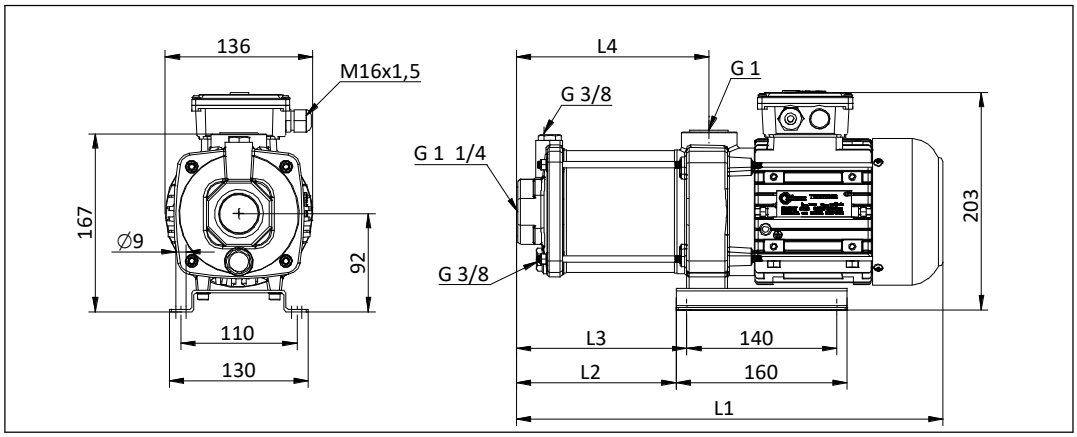
- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Erosion machines,
- Circulation systems. HC Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Inlet body	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Stage cover	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor - 2 pole, Protection degree IP 55



DIMENSIONS & NOMINAL VALUES

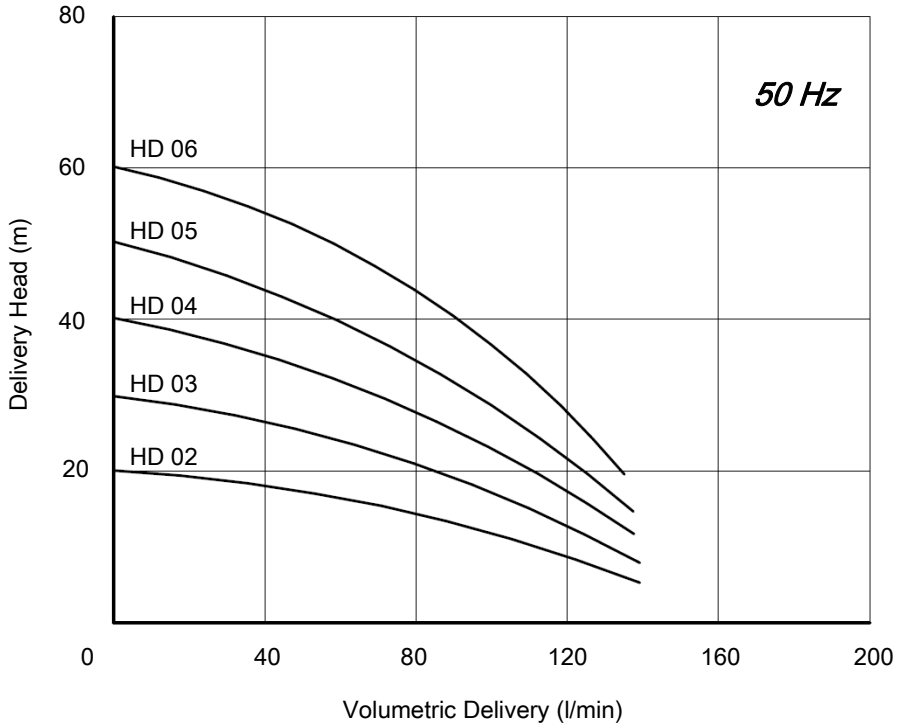
TYPE	L4	L3	L2	L1	Weight	Power	Voltage	Frequency	Rated current	Speed
	mm				kg	kW	V(Δ/Y)	Hz	A	rpm
HD 02	137	116	106	356	12.9	0.55	230/400	50	2.25/1.3	2780
HD 03	158	137	127	377	13.1	0.55			2.25/1.3	2780
HD 04	179	158	148	398	14.9	0.90			4.85/2.1	2800
HD 05	200	179	169	419	15.1	1.1			4.85/2.8	2720
HD 06	221	200	190	440	15.3	1.1			4.85/2.8	2720

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HD/05 and HD/06 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HDA PUMP

Applications:

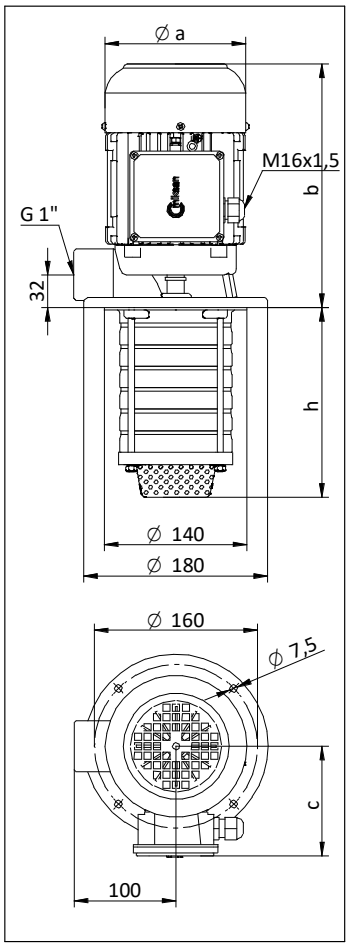
- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Cooling systems,
- Circulation systems. HDA Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55



DIMENSIONS & NOMINAL VALUES

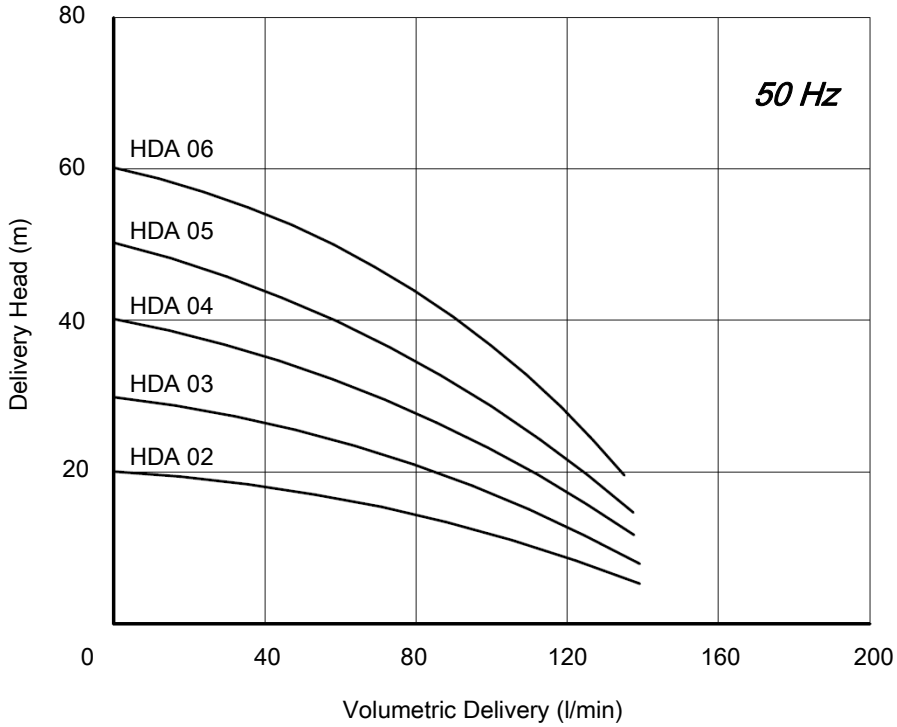
TYPE	Depth of immersion h (mm)	a	b	c	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
		mm								
HDA 02	143	138	240	111	11.2	0.55	230/400	50	2.25/1.3	2780
HDA 03	143				11.4	0.55			2.25/1.3	2780
HDA 04	164				13.4	0.90			4.85/2.1	2800
HDA 05	185				13.6	1.1			4.85/2.8	2720
HDA 06	206				13.8	1.1			4.85/2.8	2720

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HDA/05 and HDA/06 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HDB PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HDB Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

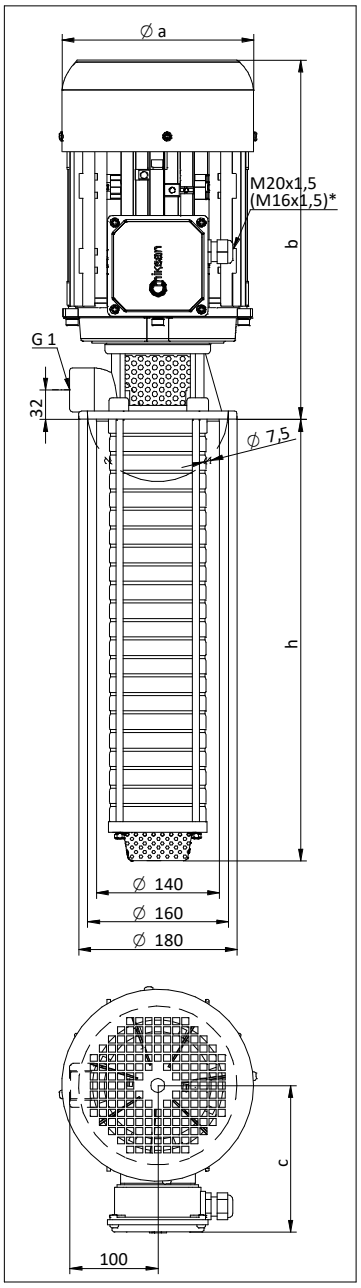
Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M16x1,5 cable gland is used on HDB/06 pumps.

** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

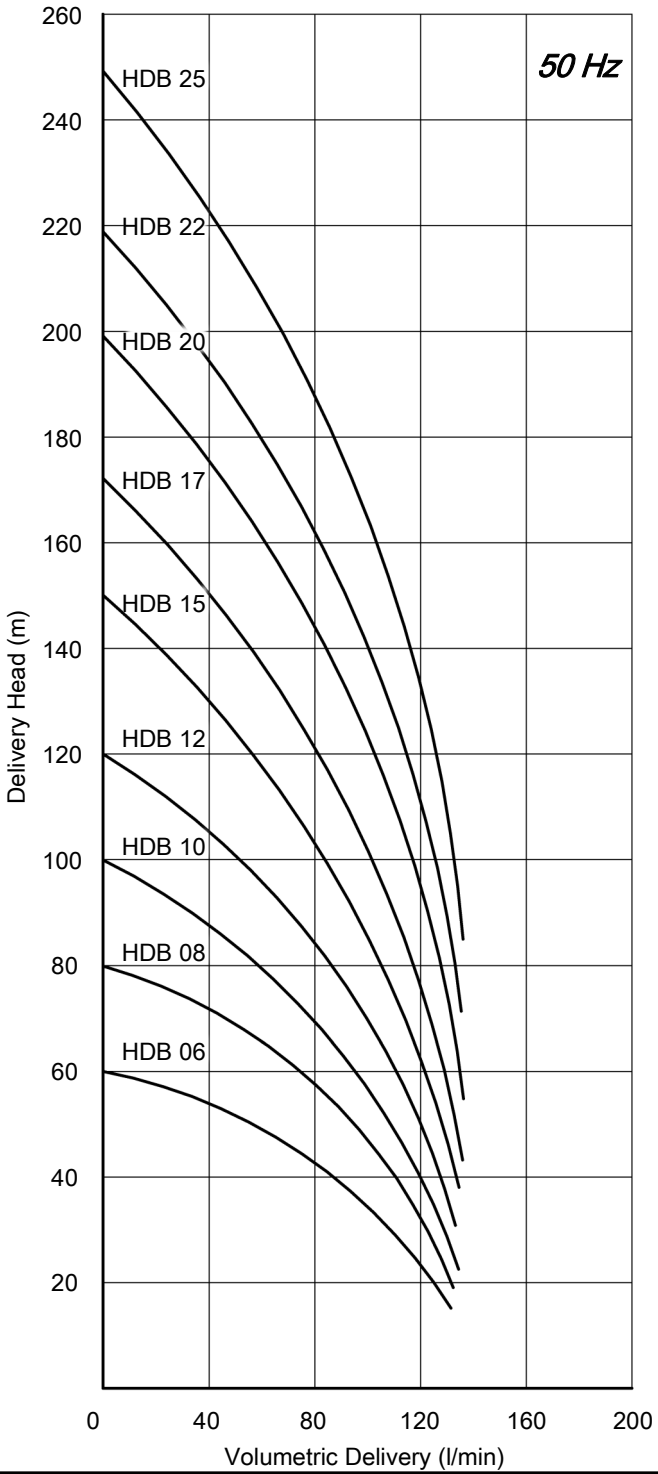
*** Curve tolerance according to ISO 9906:2012 Grade 3B.



DIMENSIONS & NOMINAL VALUES

TYPE	Depth of immersion h (mm)	a	b	c	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
		mm								
HDB 06	206	157	319	118	17.0	1.1	230/400	50	4.3/2.5	2890
HDB 08	248	176	340	139	21.5	1.5			5.72/3.3	2910
HDB 10	291	176	365	139	25.0	2.2			7.79/4.5	2905
HDB 12	333	194	397	150	32.0	3.0			10.4/6.0	2905
HDB 15	396	194	397	150	33.0	3.0			10.4/6.0	2905
HDB 17	438	194	397	150	36.0	4.0			13.3/7.7	2900
HDB 20	501	194	397	150	37.0	4.0			13.3/7.7	2900
HDB 22	543	218	406	163	41.5	5.5			18.5/10.7	2900
HDB 25	606	218	406	163	42.5	5.5			18.5/10.7	2900

Performance Curve



HEB PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 23 bar pressure,
- Circulation systems. HEB Pumps are used for pumping of cutting / cooling fluids.

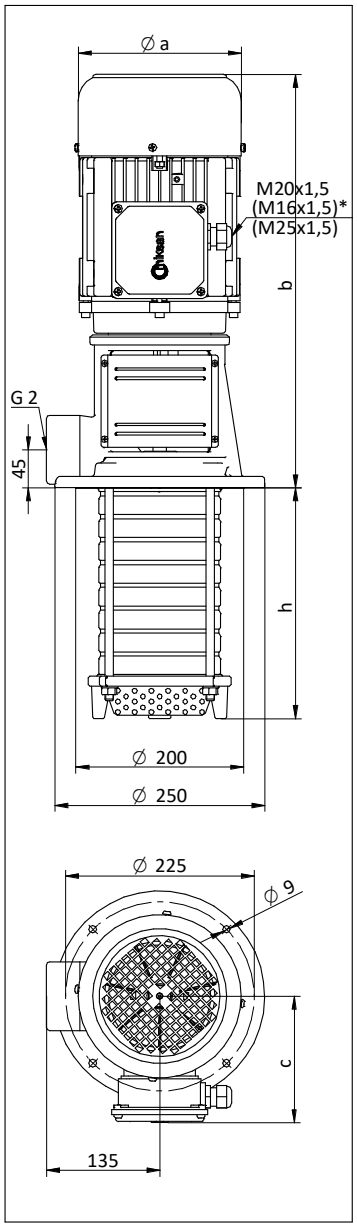
Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

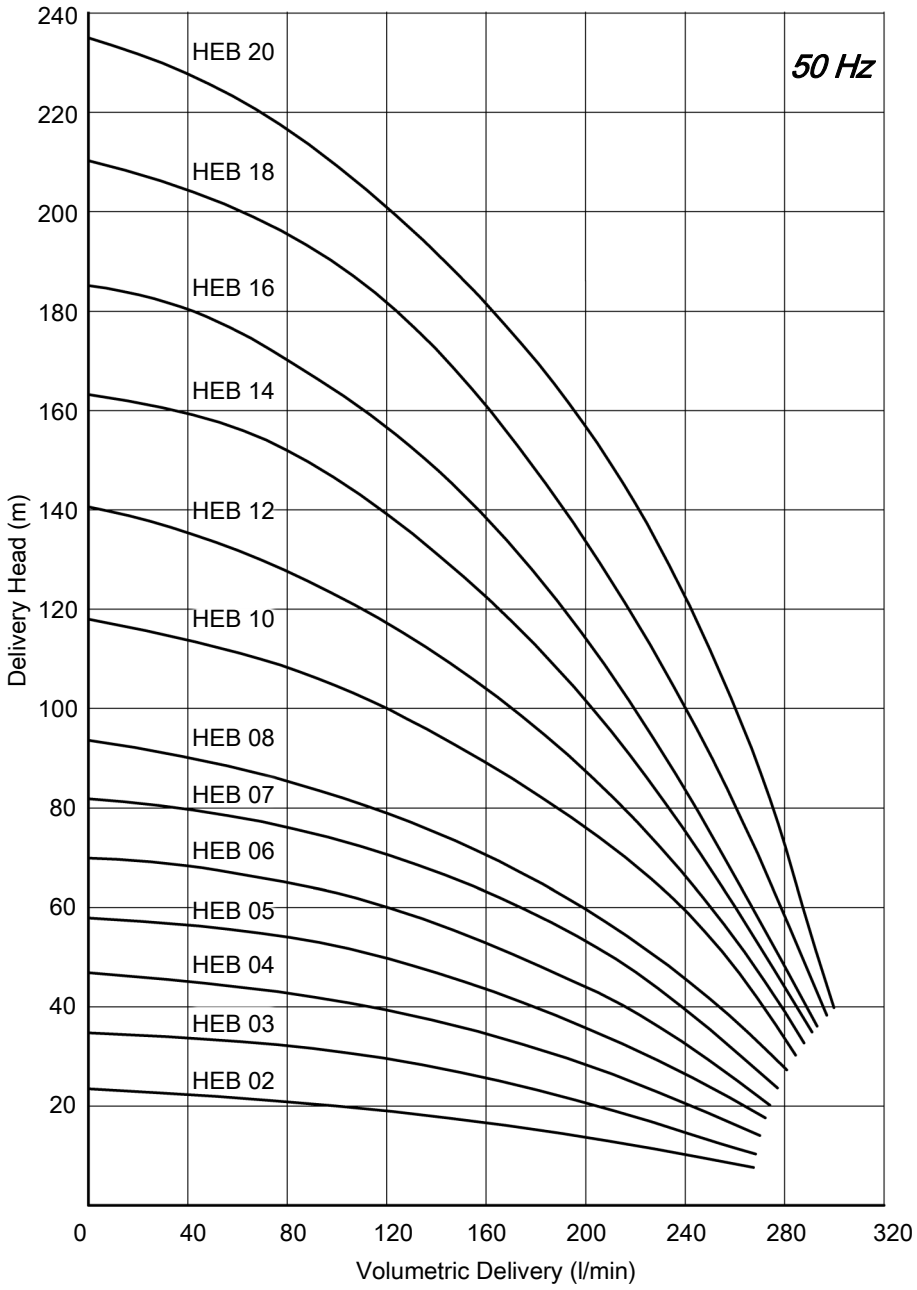
* M16x1,5 cable gland is used on HEB 02 pump.
** M25x1,5 cable gland is used on HEB 14 to HEB 20 pumps.
*** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density
**** Curve tolerance according to ISO 9906:2012 GRADE 3B.



DIMENSIONS & NOMINAL VALUES

TYPE	Depth of immersion h (mm)	a	b	c	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
		mm								
HEB 02	167	157	415	118	24.5	1.1	230/400	50	4.3/2.5	2890
HEB 03	167	176	437	139	28.5	1.5			5.72/3.3	2910
HEB 04	194	176	462	139	32.0	2.2			7.79/4.5	2905
HEB 05	221	194	489	150	38.5	3.0			10.4/6.0	2905
HEB 06	248	194	489	150	39.0	3.0			10.4/6.0	2905
HEB 07	275	194	489	150	39.5	3.0			10.4/6.0	2905
HEB 08	302	194	489	150	43.0	4.0			13.3/7.7	2900
HEB 10	356	218	502	163	49.5	5.5			18.5/10.7	2900
HEB 12	410	218	502	163	50.5	5.5			18.5/10.7	2900
HEB 14	464	258	578	177	79.0	7.5	400 Δ		13.5	2930
HEB 16	518	258	578	177	80.0	7.5			13.5	2930
HEB 18	572	258	578	177	81.0	7.5			13.5	2930
HEB 20	626	258	618	177	92.0	11.0			19.7	2930

Performance Curve



HFB PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 23 bar pressure,
- Circulation systems. HFB Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

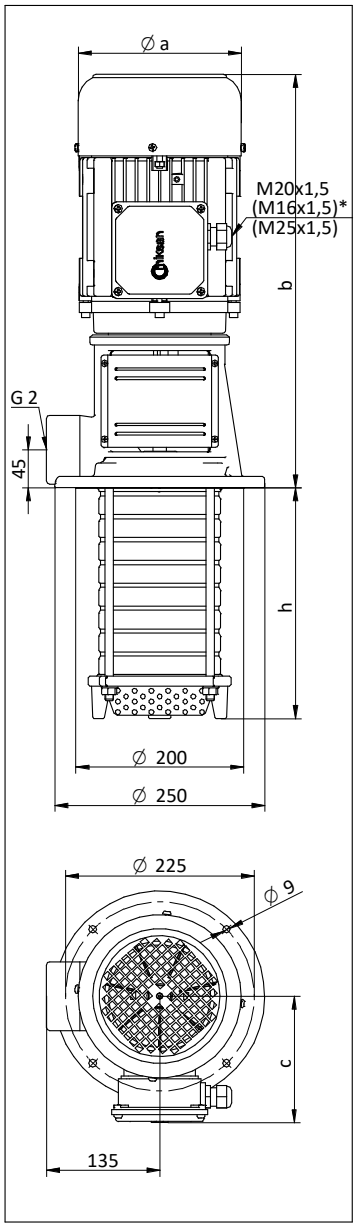
Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M25x1,5 cable gland is used on HFB 07 and over.

** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

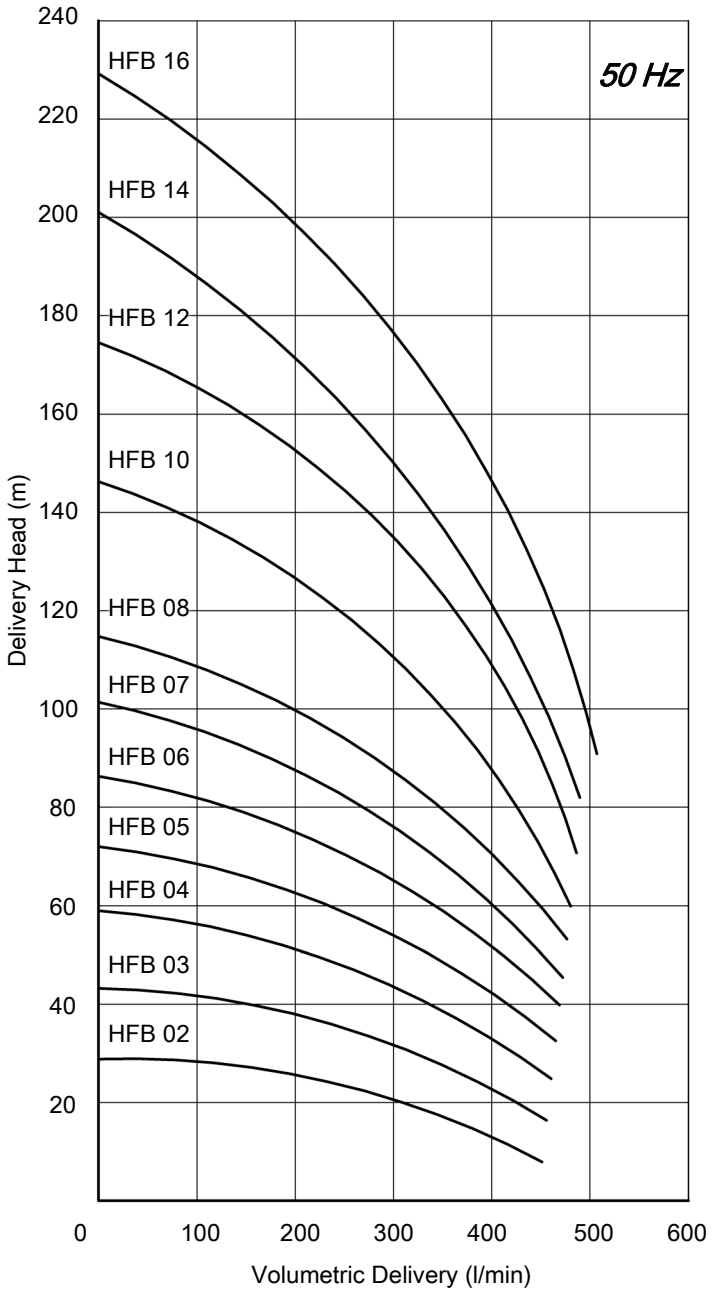
*** Curve tolerance according to ISO 9906:2012 GRADE 3B.



DIMENSIONS & NOMINAL VALUES

TYPE	Depth of immersion h (mm)	a	b	c	Weight	Power	Voltage	Frequency	Rated current	Speed
		mm			kg	kW	V(Δ/Y)	Hz	A	rpm
HFB 02	195	176	462	139	30.0	2.2	230/400	50	7.79/4.5	2905
HFB 03	195	194	489	150	35.5	3.0			10.4/6.0	2905
HFB 04	230	194	489	150	38.5	4.0			13.3/7.7	2900
HFB 05	264	218	502	163	51.0	5.5			18.5/10.7	2900
HFB 06	299	258	578	177	73.0	7.5			13.5	2930
HFB 07	333	258	578	177	73.5	7.5			13.5	2930
HFB 08	368	258	578	177	74.0	7.5			13.5	2930
HFB 10	437	258	618	177	80.5	11			19.7	2930
HFB 12	506	258	618	177	82.0	11			19.7	2930
HFB 14	575	258	618	177	94.0	15			26.9	2945
HFB 16	644	258	618	177	95.5	15			26.9	2945

Performance Curve



HCD PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HCD Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

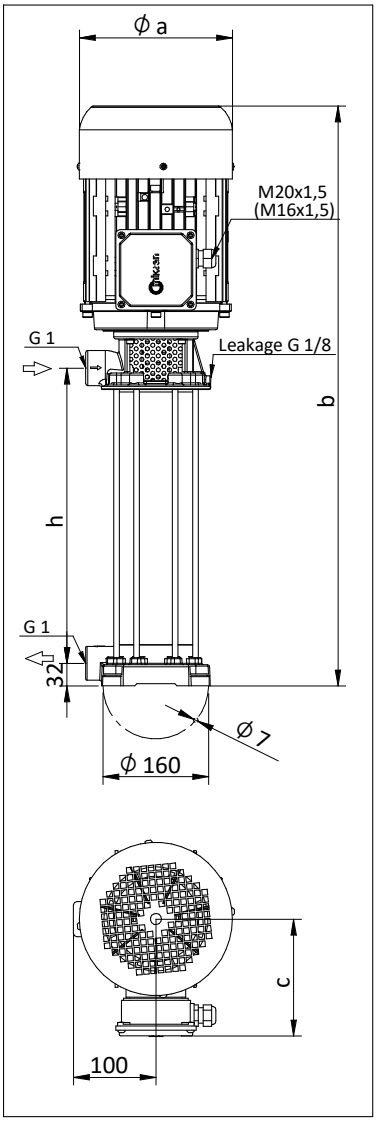
Materials:

Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M16x1,5 cable gland is used on HCD/08 pumps.

** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

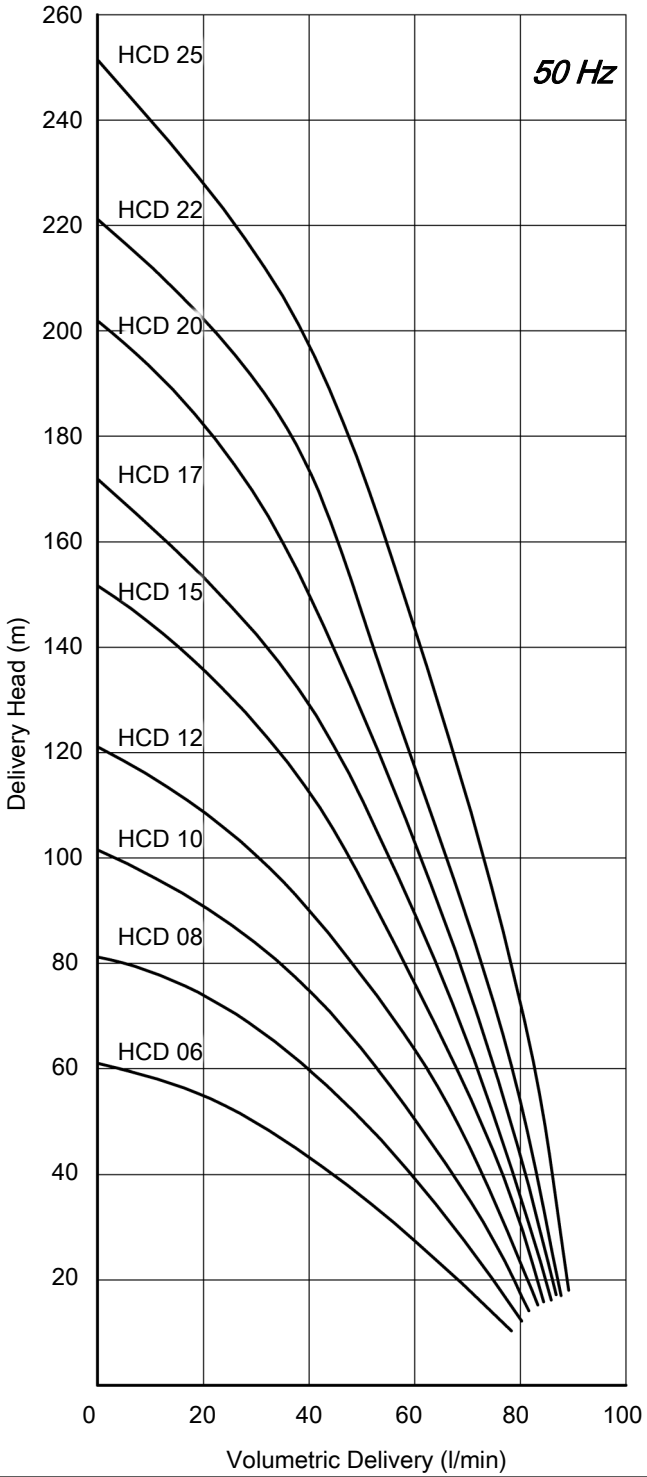
*** Curve tolerance according to ISO 9906:2012 Grade 3B.



DIMENSIONS & NOMINAL VALUES

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HCD 08	316	157	634	118	22.0	1.1	230/400	50	4.3/2.5	2890
HCD 10	316	176	680	139	29.0	2.2			7.79/4.5	2905
HCD 12	420	176	784	139	31.0	2.2			7.79/4.5	2905
HCD 15	420	194	816	150	37.5	3.0			10.4/6.0	2905
HCD 17	524	194	920	150	39.5	3.0			10.4/6.0	2905
HCD 20	524	194	920	150	42.5	4.0			13.3/7.7	2900
HCD 22	628	194	1024	150	44.5	4.0			13.3/7.7	2900
HCD 25	628	194	1024	150	45.0	4.0			13.3/7.7	2900

Performance Curve



HDD PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HDD Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

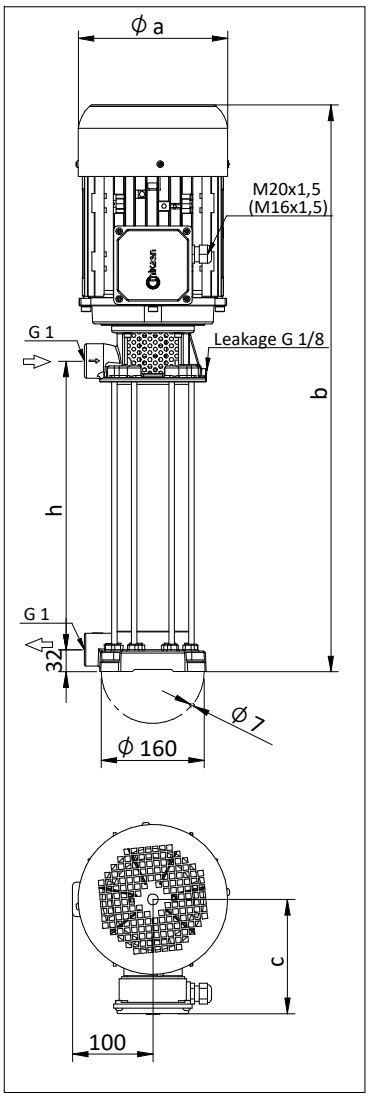
- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

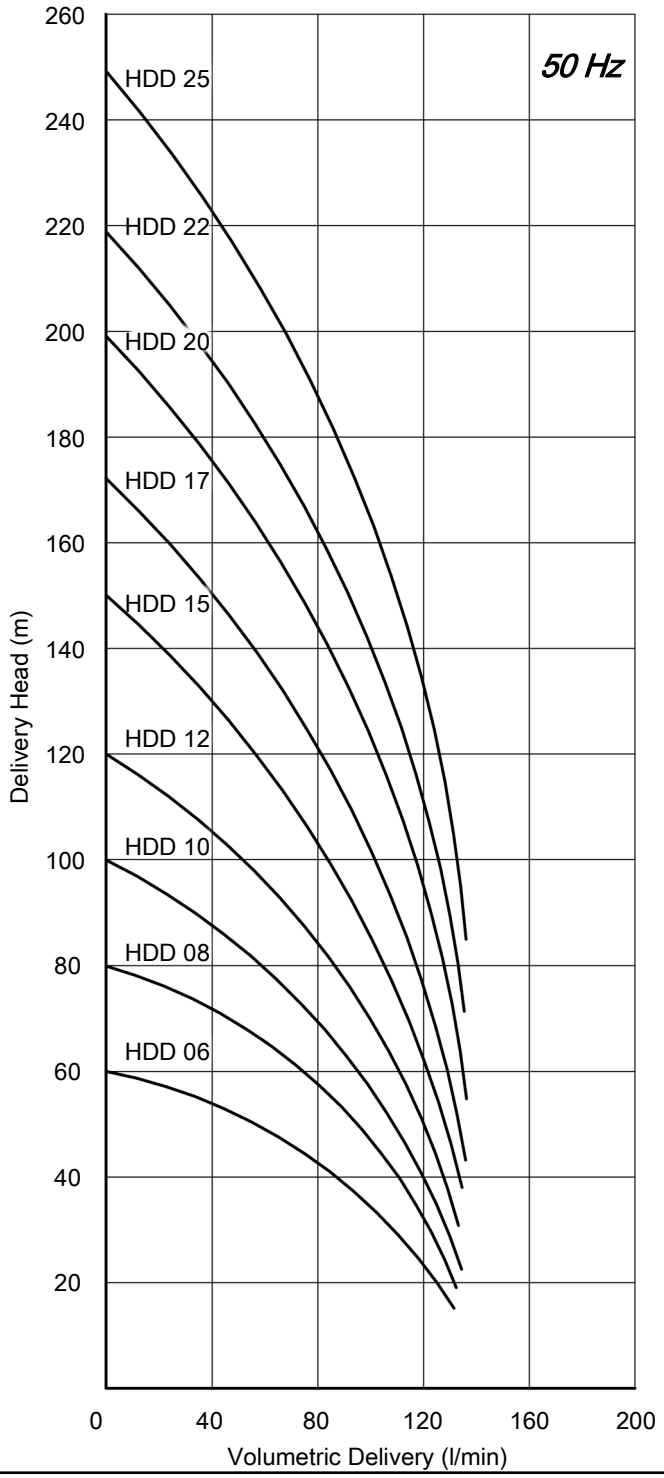
** Curve tolerance according to ISO 9906:2012 Grade 3B.



DIMENSIONS & NOMINAL VALUES

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HDD 08	316	176	655	139	26.0	1.5	230/400	50	5.72/3.3	2910
HDD 10	316	176	680	139	29.0	2.2			7.79/4.5	2905
HDD 12	420	194	816	150	37.5	3.0			10.4/6.0	2905
HDD 15	420	194	816	150	38.0	3.0			10.4/6.0	2905
HDD 17	524	194	920	150	42.0	4.0			13.3/7.7	2900
HDD 20	524	194	920	150	42.5	4.0			13.3/7.7	2900
HDD 22	628	218	1024	163	49.5	5.5			18.5/10.7	2900
HDD 25	628	218	1024	163	50.0	5.5			18.5/10.7	2900

Performance Curve



HED PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 23 bar pressure,
- Circulation systems. HED Pumps are used for pumping of cutting / cooling fluids.

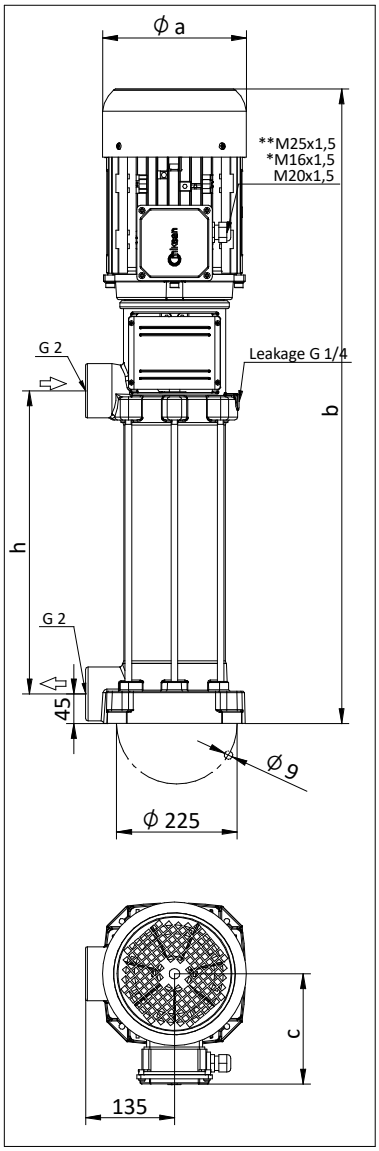
Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s (cSt)

Materials:

Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

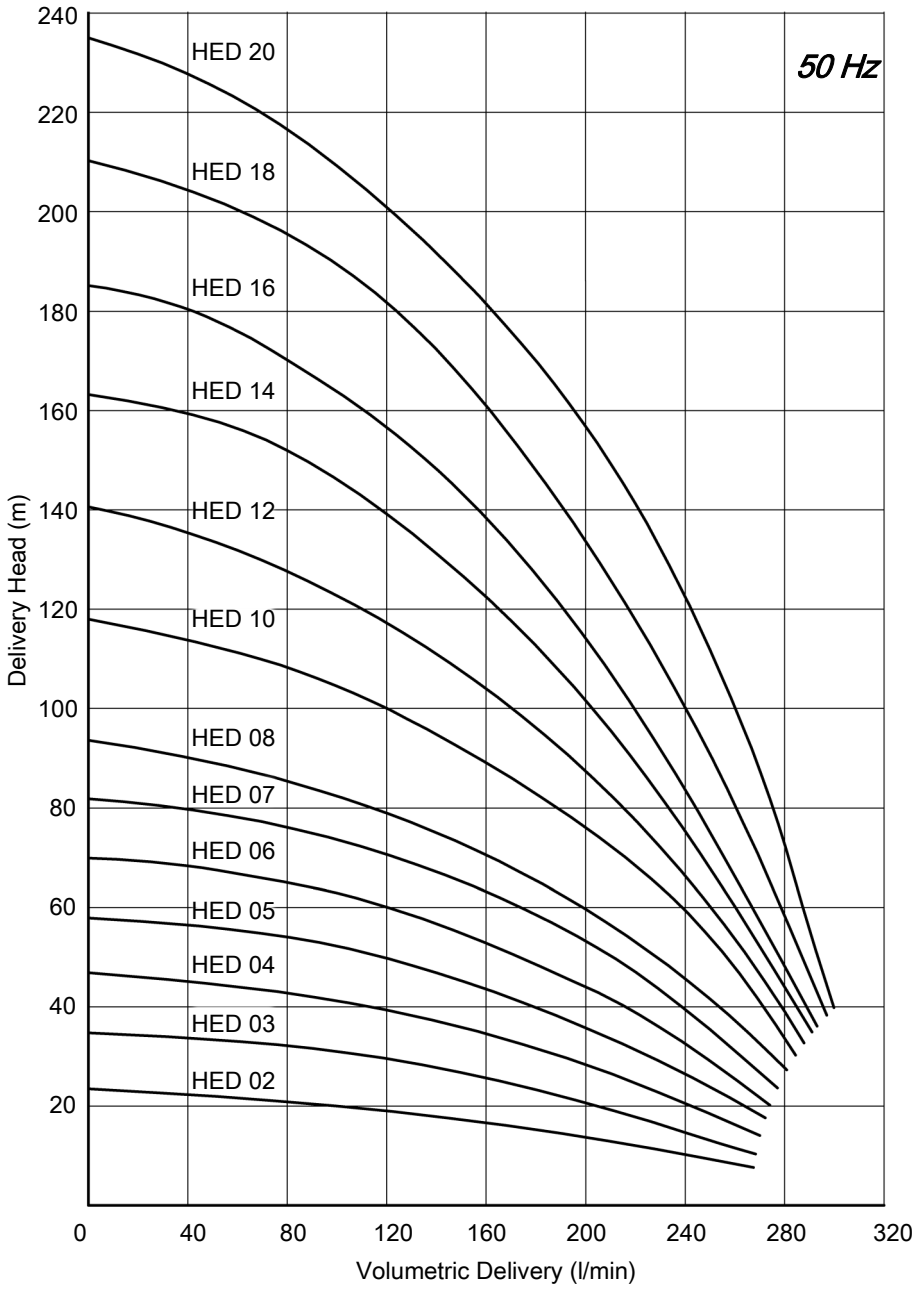
* M16x1,5 cable gland is used on HED 02 pumps.
** M25x1,5 cable gland is used on HED 14 to HED 20 pumps.
*** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density
**** Curve tolerance according to ISO 9906:2012 Grade 3B.



DIMENSIONS & NOMINAL VALUES

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HED 02	269	157	683	118	32.0	1.1	230/400	50	4.3/2.5	2890
HED 03	269	176	705	139	36.0	1.5			5.72/3.3	2910
HED 04	269	176	730	139	39.5	2.2			7.79/4.5	2905
HED 05	269	194	771	150	46.0	3.0			10.4/6.0	2905
HED 06	350	194	852	150	47.5	3.0			10.4/6.0	2905
HED 07	350	194	852	150	48.0	3.0			10.4/6.0	2905
HED 08	350	194	852	150	51.0	4.0			13.3/7.7	2900
HED 10	460	218	1074	163	59.0	5.5			18.5/10.7	2900
HED 12	460	218	1074	163	59.5	5.5			18.5/10.7	2900
HED 14	568	258	1186	177	89.5	7.5	400 Δ		13.5	2940
HED 16	568	258	1186	177	90.0	7.5			13.5	2940
HED 18	676	258	1294	177	93.0	7.5			13.5	2940
HED 20	676	258	1294	177	103.0	11.0			19.7	2930

Performance Curve



HFD PUMP

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 23 bar pressure,
- Circulation systems. HFD Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s (cSt)

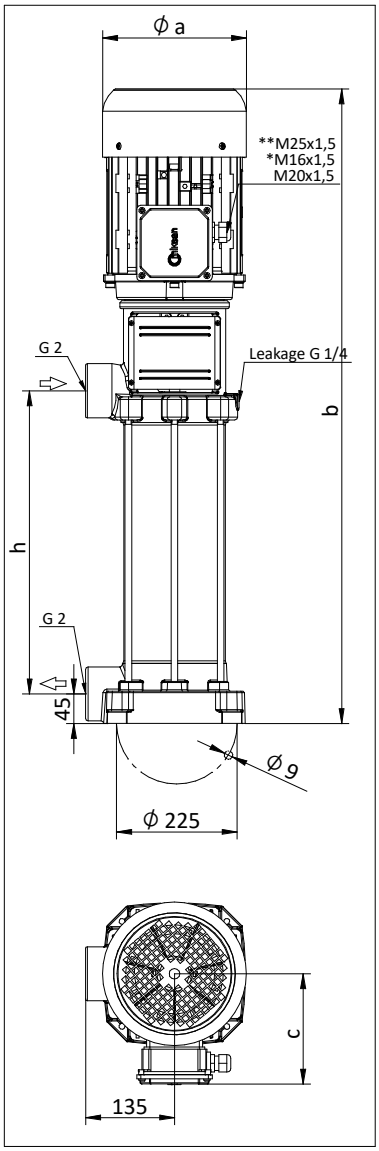
Materials:

Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M25x1,5 cable gland is used on HFD 07 and over.

** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

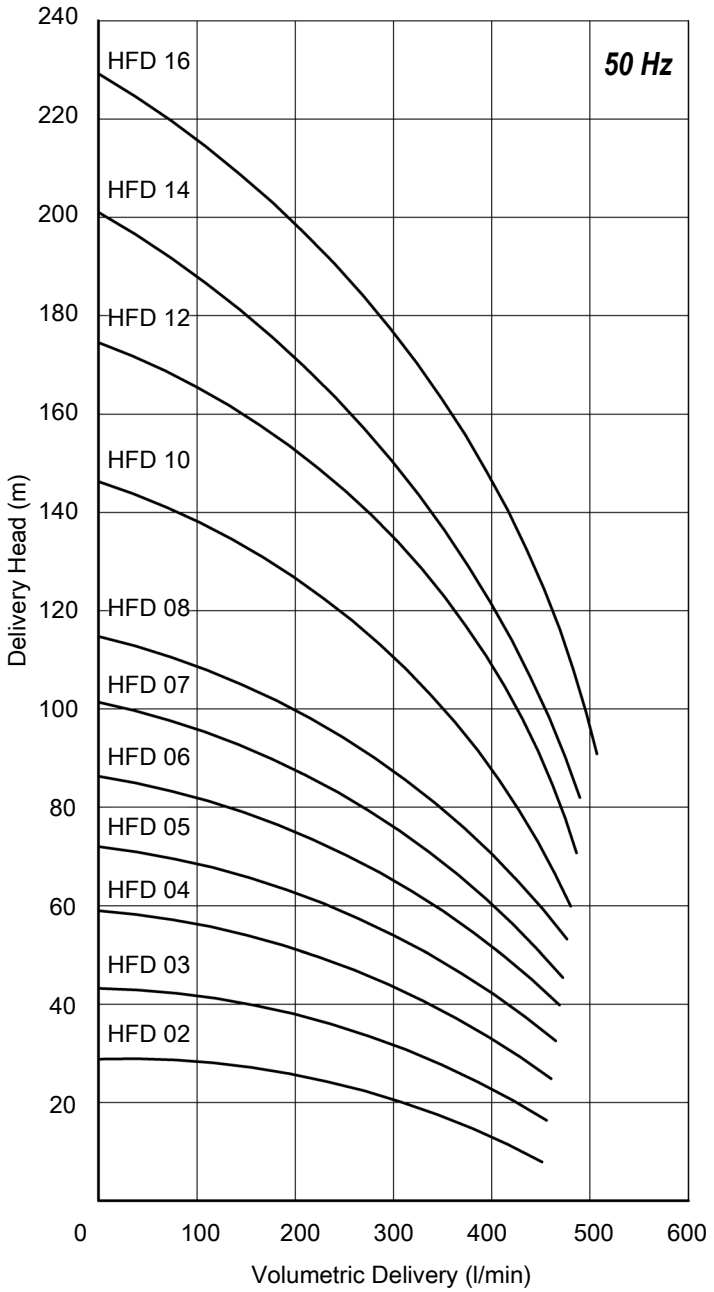
*** Curve tolerance according to ISO 9906:2012 Grade 3B.

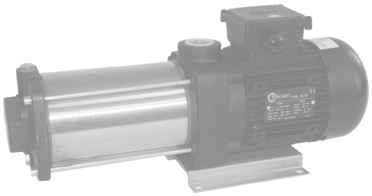


DIMENSIONS & NOMINAL VALUES

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HFD 02	300	176	761	139	37.5	2.2	230/400	50	7.79/4.5	2905
HFD 03	300	194	802	150	43.0	3.0			10.4/6.0	2905
HFD 04	300	194	802	150	45.5	4.0			13.3/7.7	2900
HFD 05	300	218	914	163	57.5	5.5			18.5/10.7	2900
HFD 06	404	258	1094	177	80.0	7.5	400 Δ		13.5	2930
HFD 07	404	258	1094	177	80.5	7.5			13.5	2930
HFD 08	404	258	1094	177	81.0	7.5			13.5	2930
HFD 10	542	258	1262	177	89.0	11			19.7	2930
HFD 12	542	258	1262	177	89.5	11			19.7	2930
HFD 14	680	258	1400	177	102.0	15			26.9	2945
HFD 16	680	258	1400	177	102.5	15			26.9	2945

Performance Curve





HC PUMP

60 Hz

Applications:

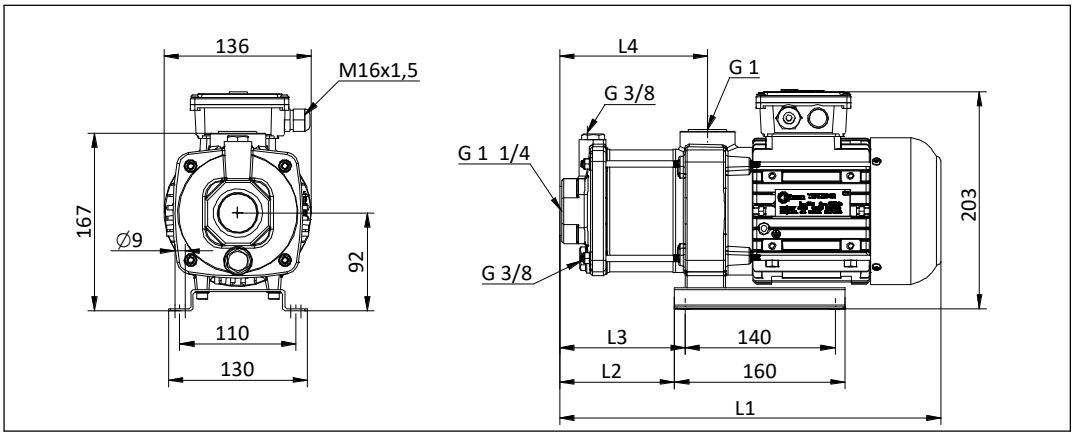
- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Erosion machines,
- Circulation systems. HC Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Inlet body	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Stage cover	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor - 2 pole, Protection degree IP 55



DIMENSIONS & NOMINAL VALUES

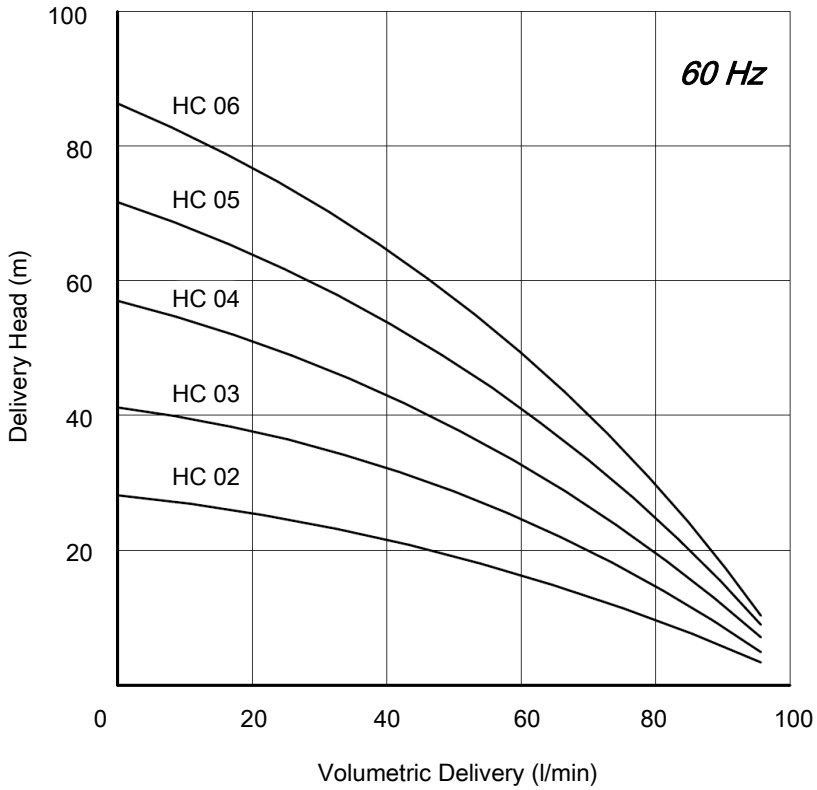
TYPE	L4	L3	L2	L1	Weight	Power	Voltage	Frequency	Rated current	Speed
	mm				kg	kW	V(Δ/Y)	Hz	A	rpm
HC 02	137	116	106	356	11.8	0.44	265/460	60	1.82/1.05	3340
HC 03	158	137	127	377	13.1	0.66			2.25/1.3	3330
HC 04	179	158	148	398	15.0	0.90			3.12/1.8	3380
HC 05	200	179	169	419	15.1	1.3			4.85/2.8	3260
HC 06	221	200	190	440	15.3	1.3			4.85/2.8	3260

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HC/05 and HC/06 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HCA PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Erosion machines,
- Circulation systems. HCA Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

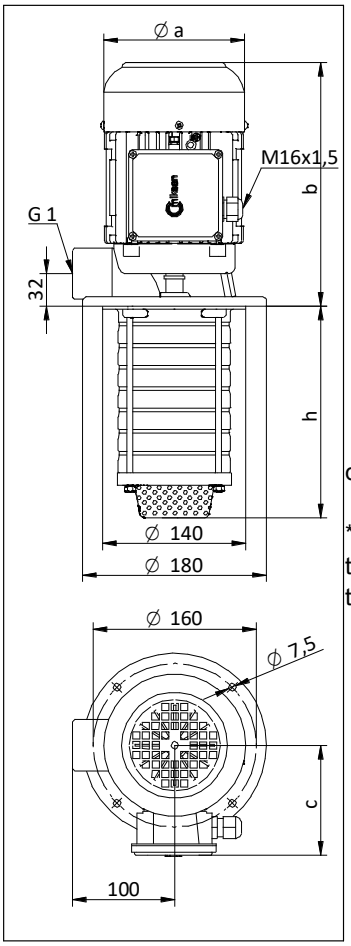
- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Stage cover	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor - 2 pole, Protection degree IP 55

60 Hz

DIMENSIONS & NOMINAL VALUES



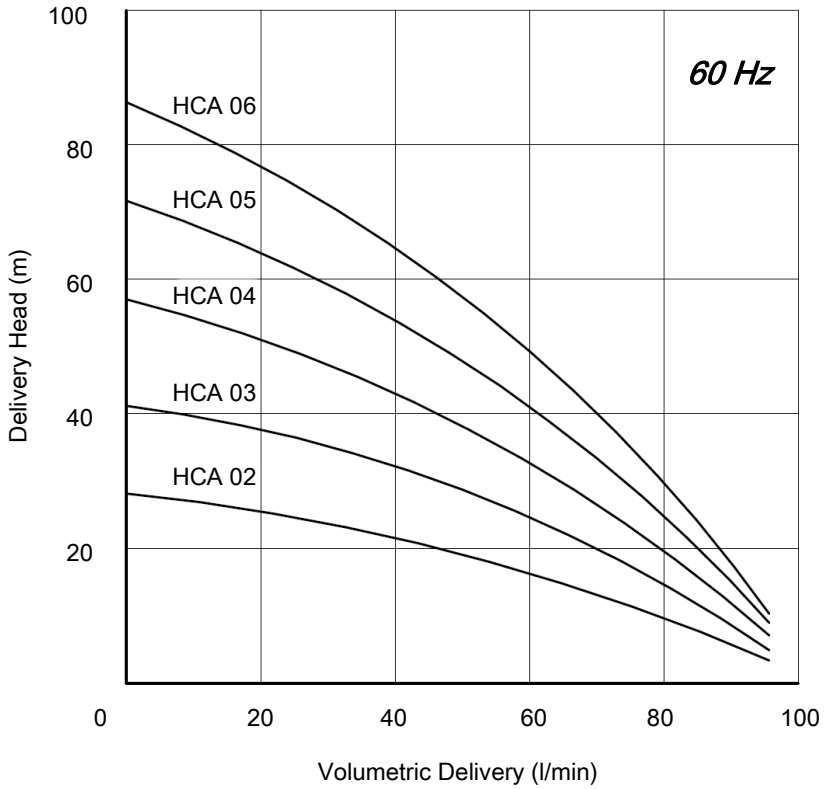
TYPE	Depth of immersion h (mm)	a	b	c	Weight	Power	Voltage	Frequency	Rated current	Speed
		mm			kg	kW	V(Δ/Y)	Hz	A	rpm
HCA 02	143	138	240	111	10.1	0.44	265/460	60	1.82/1.05	3340
HCA 03	143				11.4	0.66			2.25/1.3	3330
HCA 04	164				13.3	0.90			3.12/1.8	3380
HCA 05	185				13.6	1.32			4.85/2.8	3260
HCA 06	206				13.8	1.32			4.85/2.8	3260

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HCA/05 and HCA/06 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HCB PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HCB Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M16x1,5 cable gland is used on HCB/06 pumps.

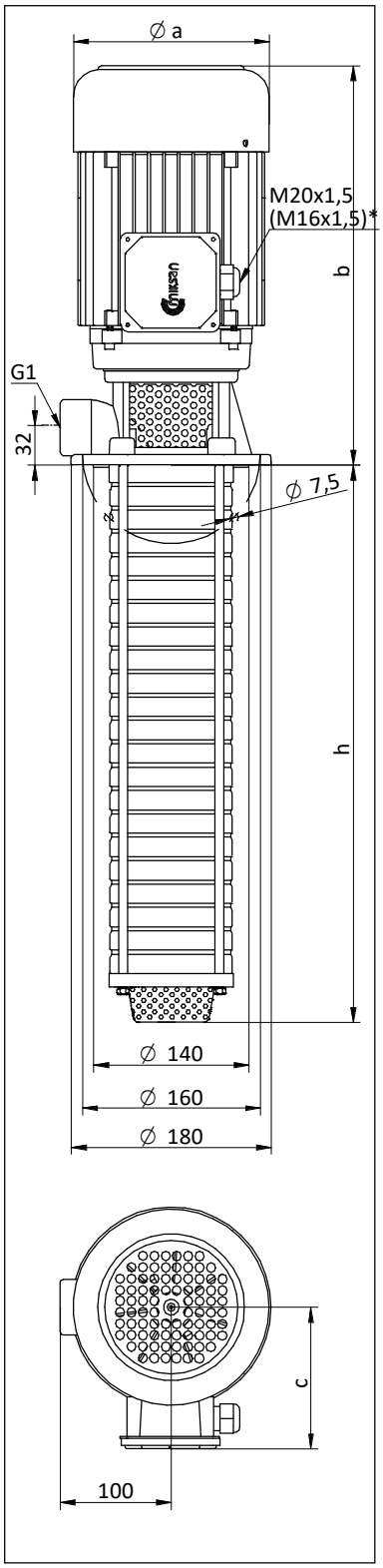
** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

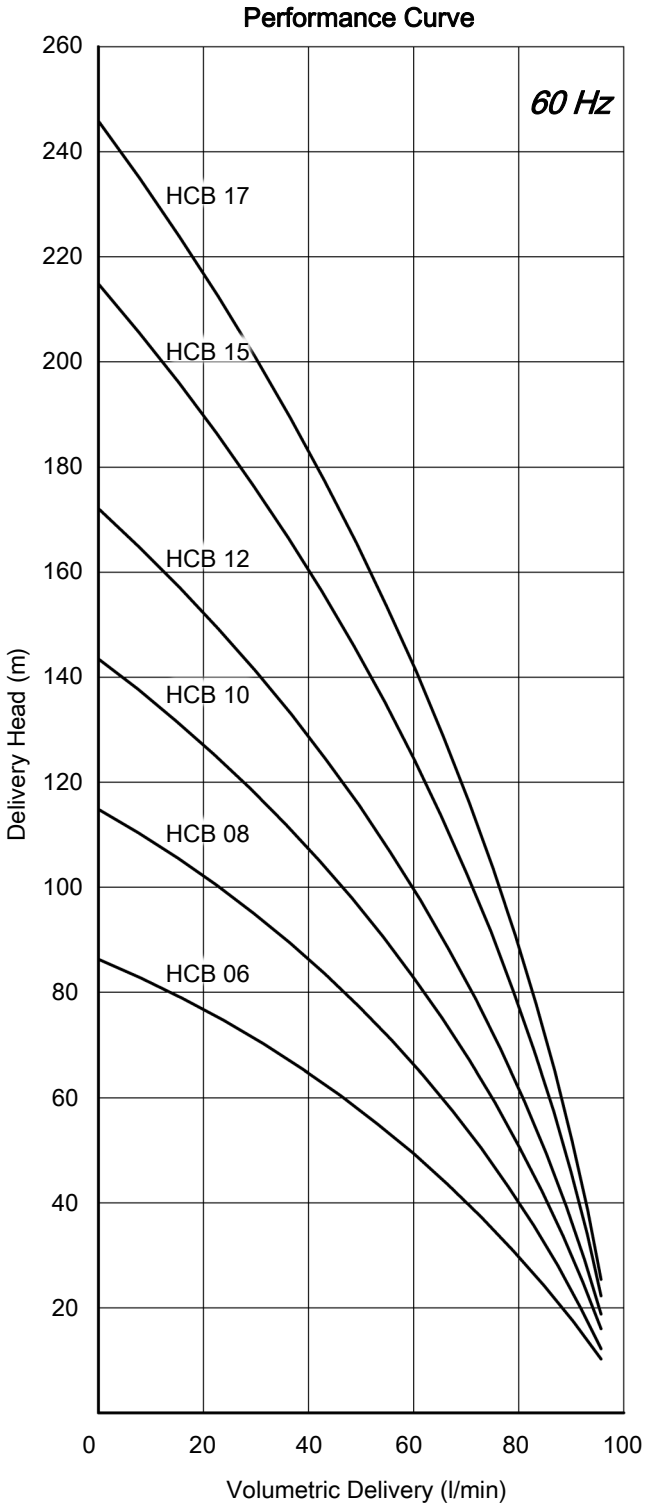
*** Curve tolerance according to ISO 9906:2012 Grade 3B.

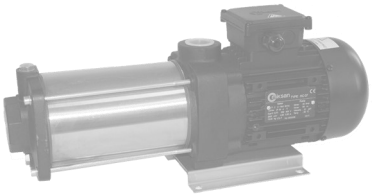
60 Hz

DIMENSIONS & NOMINAL VALUES

TYPE	Depth of immersion h (mm)	a (mm)	b (mm)	c (mm)	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HCB 06	206	157	319	118	17.0	1.3	265/460	60	4.35/2.5	3470
HCB 08	248	176	365	139	21.5	1.8			5.72/3.3	3490
HCB 10	291	176	365	139	25.0	2.65			7.79/4.5	3490
HCB 12	333	194	397	150	32.0	3.6			10.4/6.0	3495
HCB 15	396	194	397	150	33.0	3.6			10.4/6.0	3495
HCB 17	438	194	397	150	36.0	4.8			13.5/7.8	3485







HD PUMP

60 Hz

Applications:

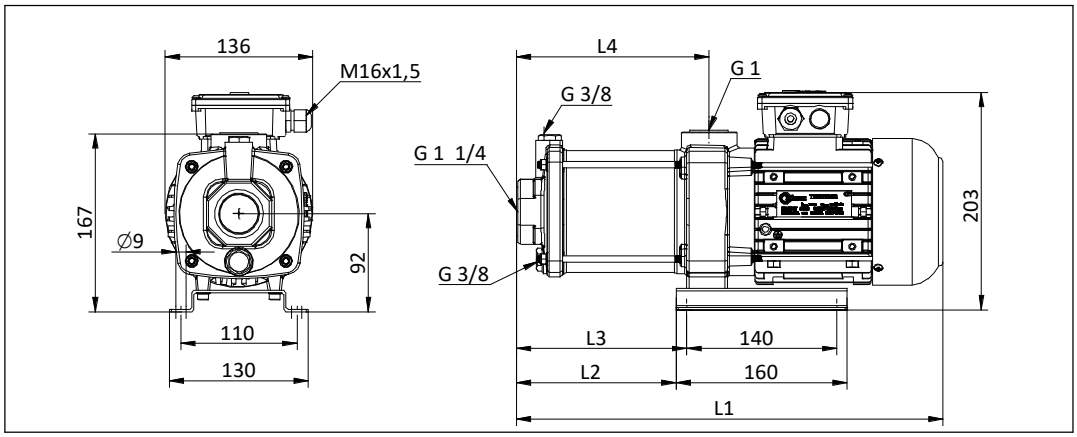
- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Erosion machines,
- Circulation systems. HD Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Inlet body	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Stage cover	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor - 2 pole, Protection degree IP 55



DIMENSIONS & NOMINAL VALUES

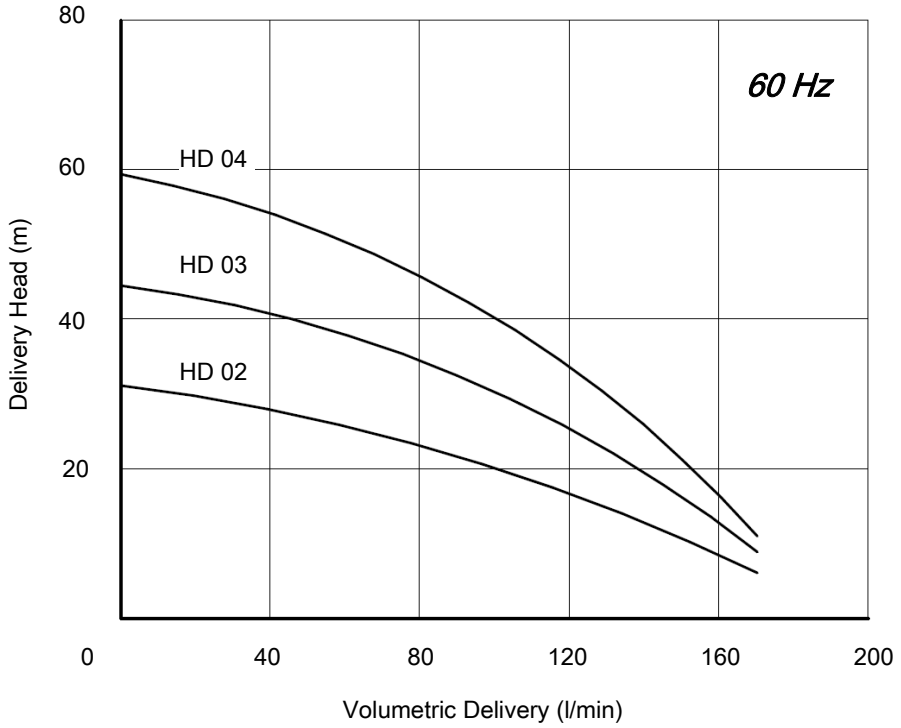
TYPE	L4	L3	L2	L1	Weight	Power	Voltage	Frequency	Rated current	Speed
	mm				kg	kW	V(Δ/Y)	Hz	A	rpm
HD 02	137	116	106	356	13.5	0.66	265/460	60	2.25/1.3	3330
HD 03	158	137	127	377	14.5	1.32			4.85/2.8	3260
HD 04	179	158	148	398	14.9	1.32			4.85/2.8	3260

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HD/03 and HD/04 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HDA PUMP

60 Hz

Applications:

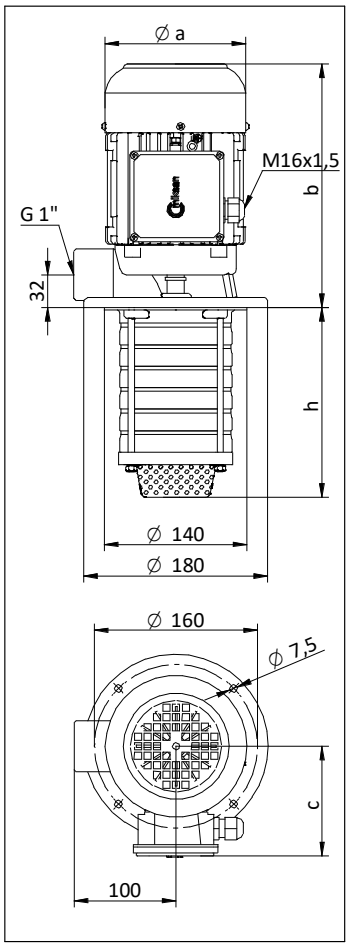
- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Cooling systems,
- Circulation systems. HDA Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55



DIMENSIONS & NOMINAL VALUES

60 Hz

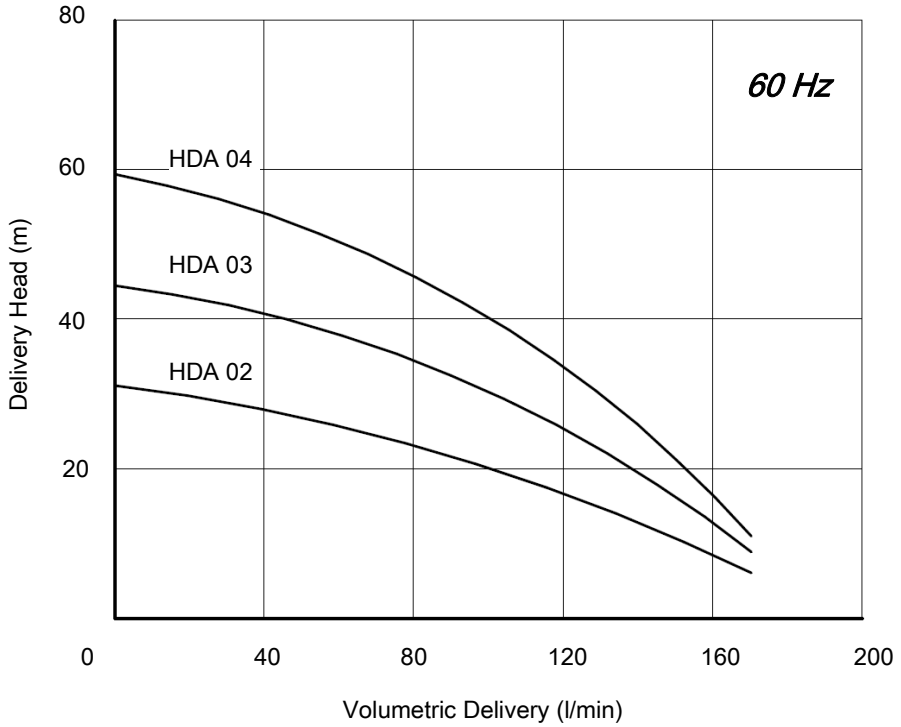
TYPE	Depth of immersion h (mm)	a	b	c	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
		mm								
HDA 02	143	138	240	111	11.2	0.66	265/460	60	2.25/1.3	3330
HDA 03	143				13.0	1.32			4.85/2.8	3260
HDA 04	164				13.4	1.32			4.85/2.8	3260

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

*** HDA/04, HDA/05 and HDA/06 pumps have IE2 motors. According to IEC 60034-30-1:2014 standard these pumps are excluded from efficiency class since their motors are completely integrated into the pump.

Performance Curve



HDB PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HDB Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

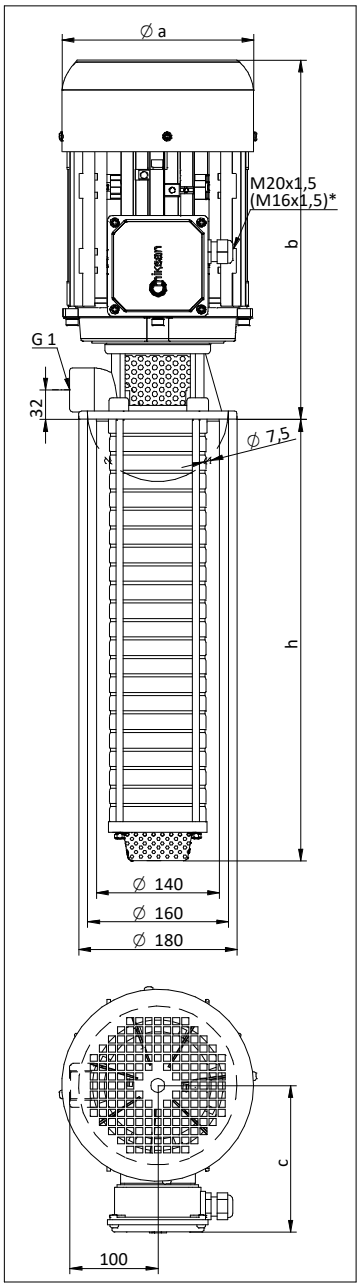
Pump body	: Cast iron - DIN GG 25
Bottom plate	: Sheet iron
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

** Curve tolerance according to ISO 9906:2012 Grade 3B.

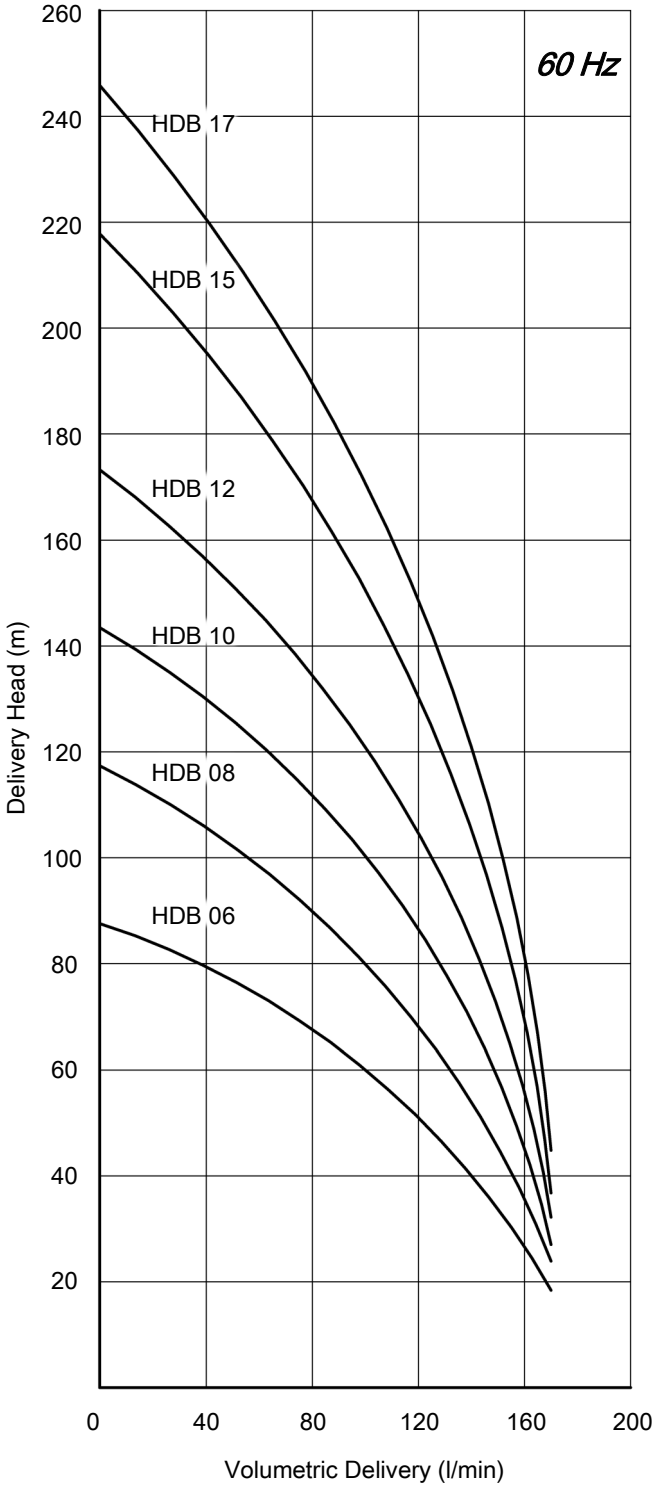
60 Hz

DIMENSIONS & NOMINAL VALUES



TYPE	Depth of immersion h (mm)	a	b	c	Weight	Power	Voltage	Frequency	Rated current	Speed
		mm			kg	kW	V(Δ/Y)	Hz	A	rpm
HDB 06	206	176	340	139	24.5	2.65	265/460	60 Hz	7.79/4.5	3490
HDB 08	248	176	340	139	25.0	2.65			7.79/4.5	3490
HDB 10	291	194	397	150	31.5	3.6			10.4/6.0	3495
HDB 12	333	194	397	150	35.5	4.8			13.5/7.8	3485
HDB 15	396	194	397	150	36.0	4.8			13.5/7.8	3485
HDB 17	438	218	410	163	42.0	6.6			18.4/10.6	3520

Performance Curve



HEB PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 23 bar pressure,
- Circulation systems. HEB Pumps are used for pumping of cutting / cooling fluids.

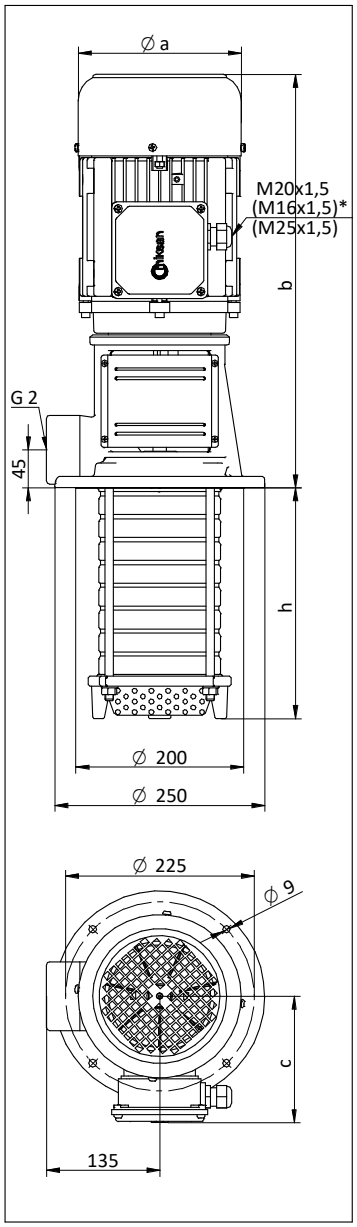
Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M25x1,5 cable gland is used on HEB 10, HEB 12 and HEB 14 pumps.
** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density
*** Curve tolerance according to ISO 9906:2012 GRADE 3B.

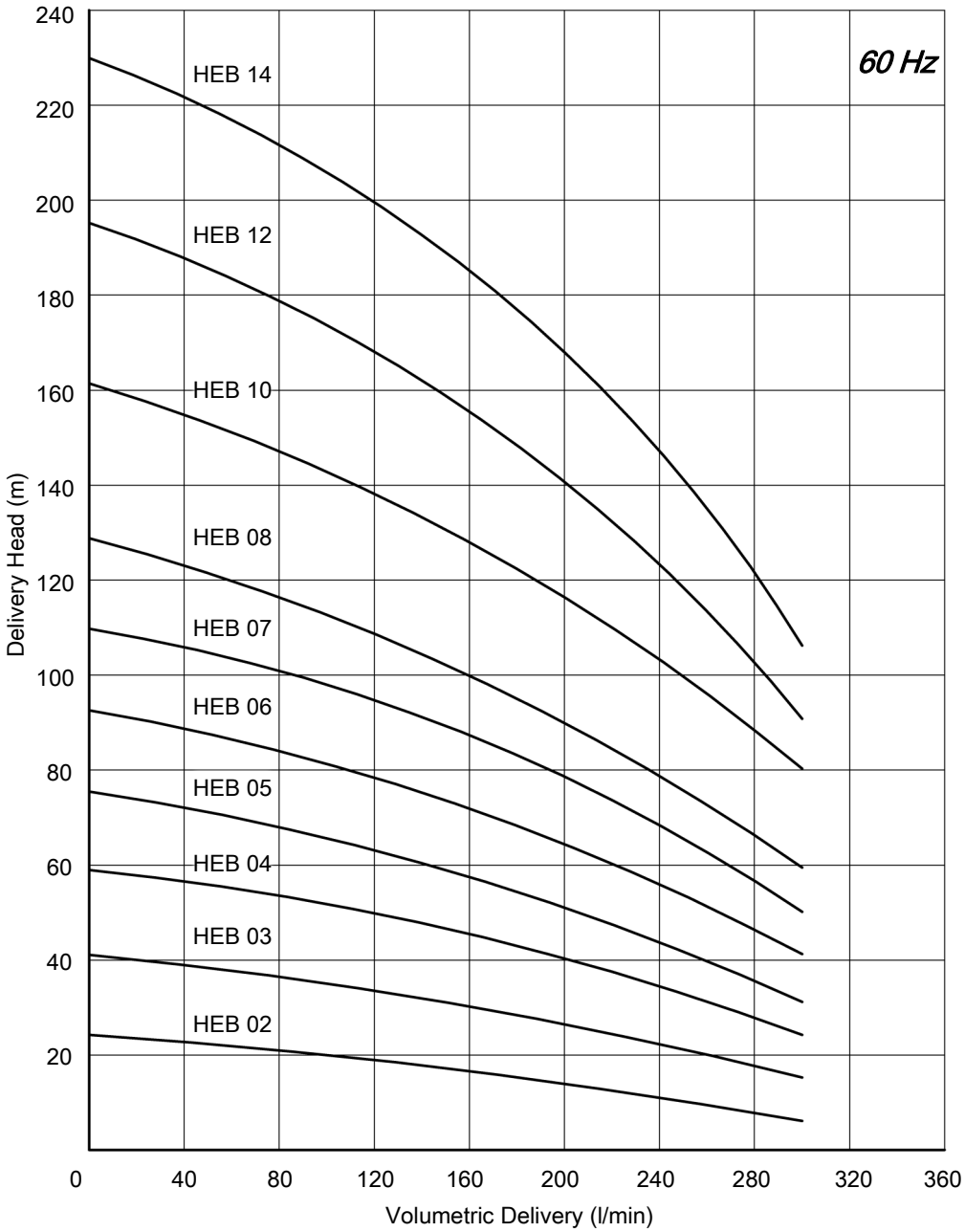


DIMENSIONS & NOMINAL VALUES

60 Hz

TYPE	Depth of immersion h (mm)	a	b	c	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
		mm								
HEB 02	167	176	437	139	28.0	1.8	265/460	60 Hz	5.72/3.3	3490
HEB 03	167	176	462	139	31.5	2.65			7.79/4.5	3490
HEB 04	194	194	489	150	38.0	3.6			10.4/6.0	3495
HEB 05	221	194	489	150	38.5	3.6			10.4/6.0	3495
HEB 06	248	194	489	150	42.0	4.8			13.5/7.8	3485
HEB 07	275	218	502	163	48.5	6.6			18.4/10.6	3520
HEB 08	302	218	502	163	49.0	6.6			18.4/10.6	3520
HEB 10	356	258	589	177	74.0	9.0	460 Δ		13.5	3505
HEB 12	410	258	589	177	74.5	9.0			13.5	3505
HEB 14	464	258	618	177	85.0	13.2			19.7	3510

Performance Curve



HFB PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HFB Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Bottom plate	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M20x1,5 cable gland is used on HFB 02 and HFB 03 pumps

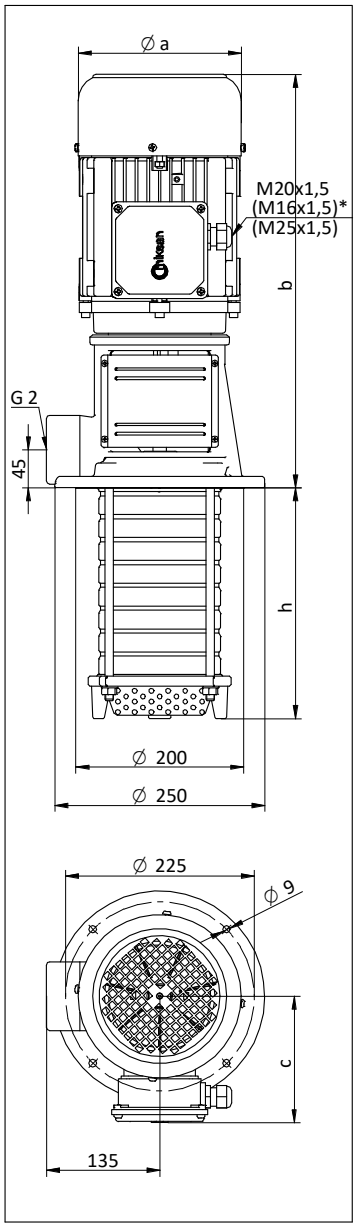
. ** M25x1,5 cable gland is used on HFB 04 to HFB 08 pumps.

*** M32x1,5 cable gland is used on HFB 04 to HFB 08 pumps.

**** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

***** Curve tolerance according to ISO 9906:2012 Grade 3B.

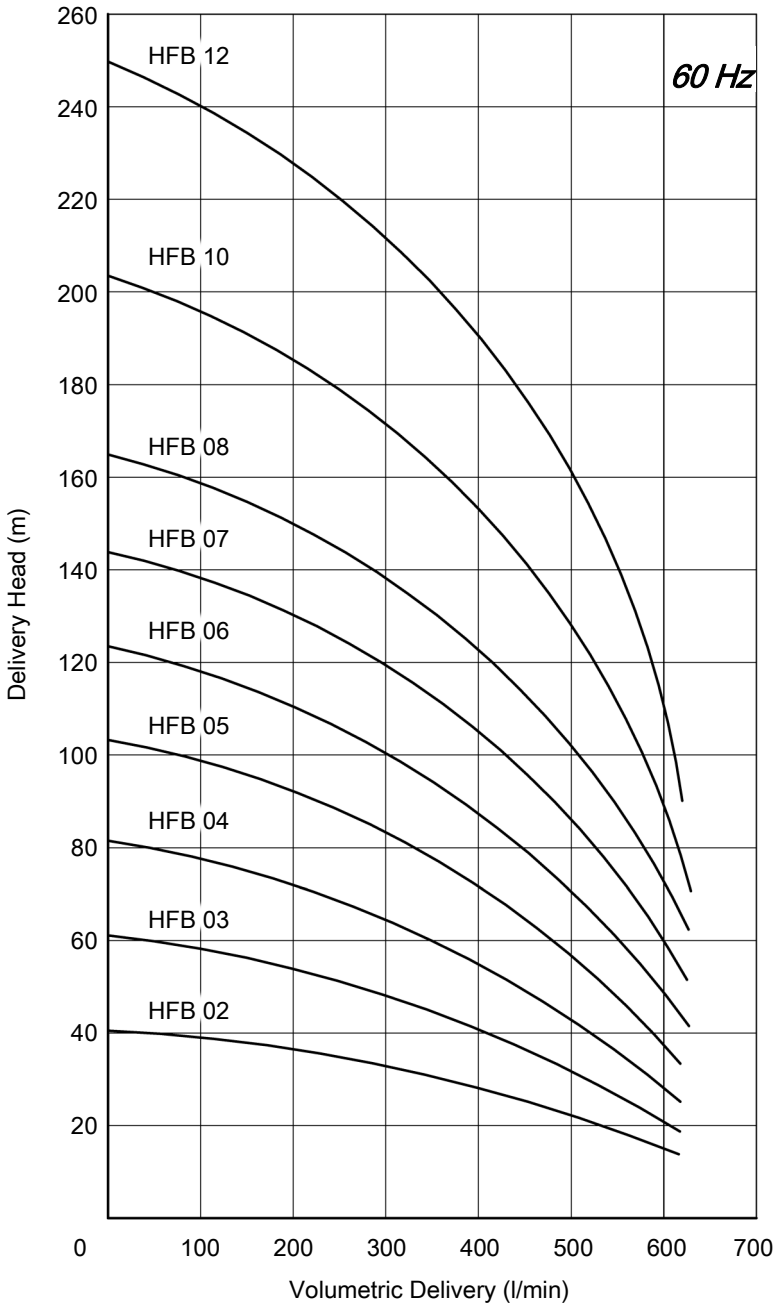
60 Hz



DIMENSIONS & NOMINAL VALUES

TYPE	Depth of immersion h (mm)	a	b	c	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
		mm								
HFB 02	195	194	697	150	32.5	4.8	265/460	50	13.5/7.8	3485
HFB 03	195	194	697	150	33.0	4.8			13.5/7.8	3485
HFB 04	230	194	920	150	68.5	9.0	460 Δ		13.5	3505
HFB 05	264	218	954	163	69.0	9.0			13.5	3505
HFB 06	299	258	1019	177	74.5	13.2			19.7	3510
HFB 07	333	258	1053	177	75.0	13.2			19.7	3510
HFB 08	368	258	1088	177	89.5	17.4			26.7	3540
HFB 10	437	258	1267	177	112.0	22.2			31.7	3525
HFB 12	506	258	1336	177	113.0	22.2			31.7	3525

Performance Curve



HCD PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HCD Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

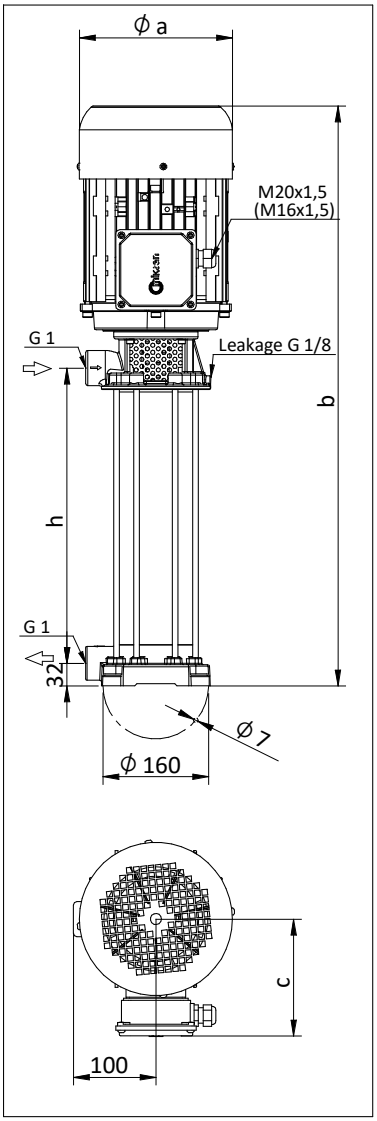
- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

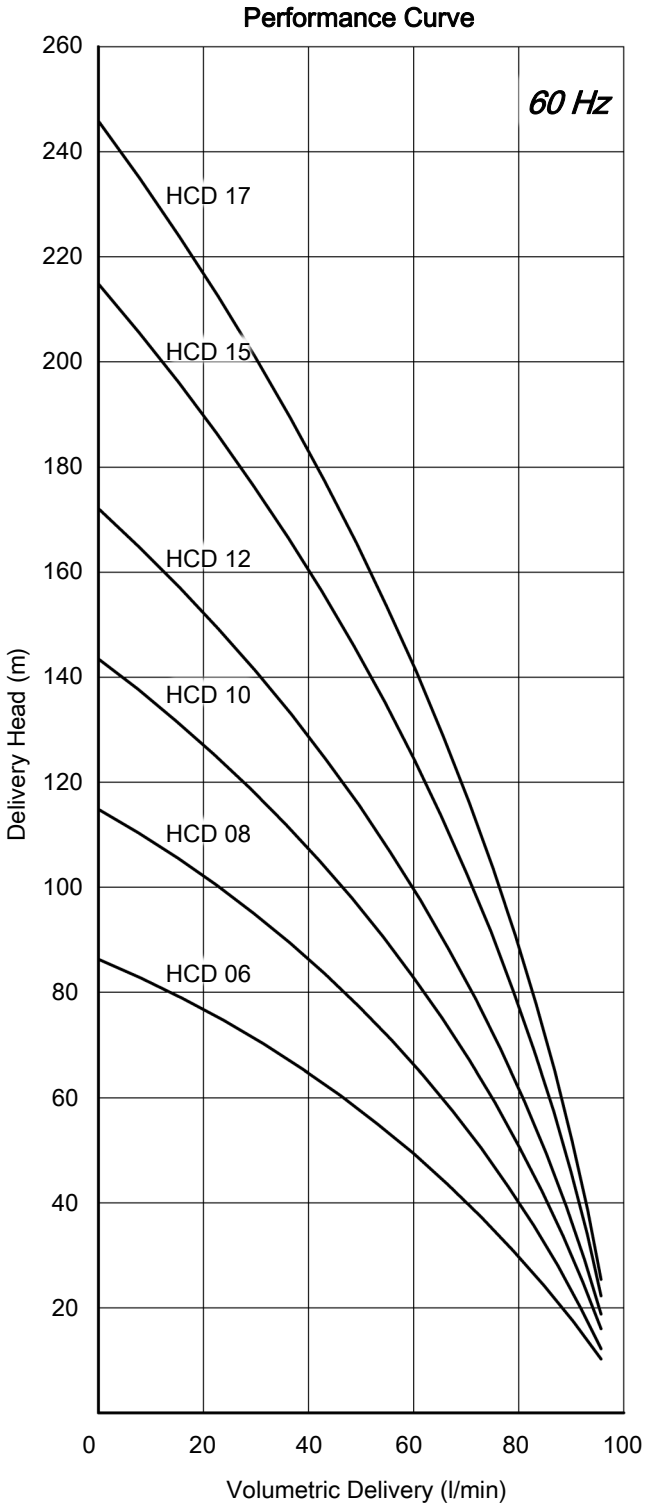
** Curve tolerance according to ISO 9906:2012 Grade 3B.



DIMENSIONS & NOMINAL VALUES

60 Hz

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(△/Y)	Frequency Hz	Rated current A	Speed rpm
HCD 08	316	157	655	118	27.0	1.8	265/460	60	5.72/3.3	3490
HCD 10	316	176	680	139	30.5	2.65			7.79/4.5	3490
HCD 12	420	176	816	139	37.0	3.6			10.4/6.0	3495
HCD 15	420	194	816	150	38.0	3.6			10.4/6.0	3495
HCD 17	524	194	920	150	41.0	4.8			13.5/7.8	3485



HDD PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HDD Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

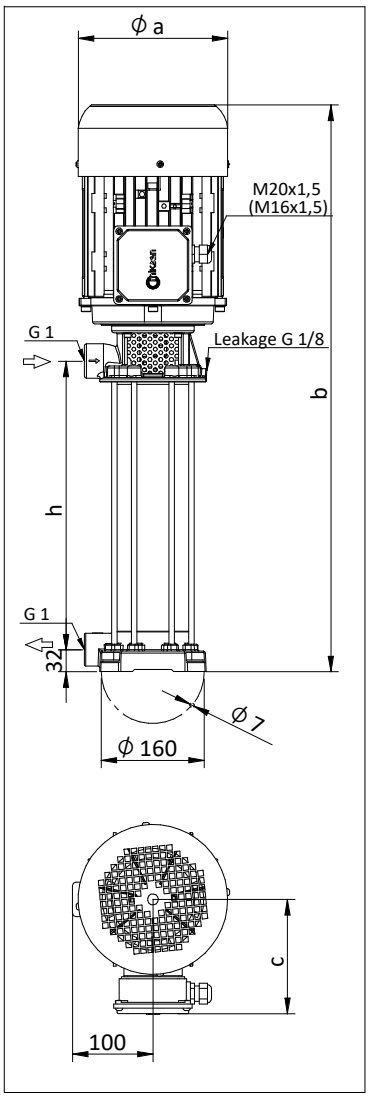
- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s

Materials:

Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

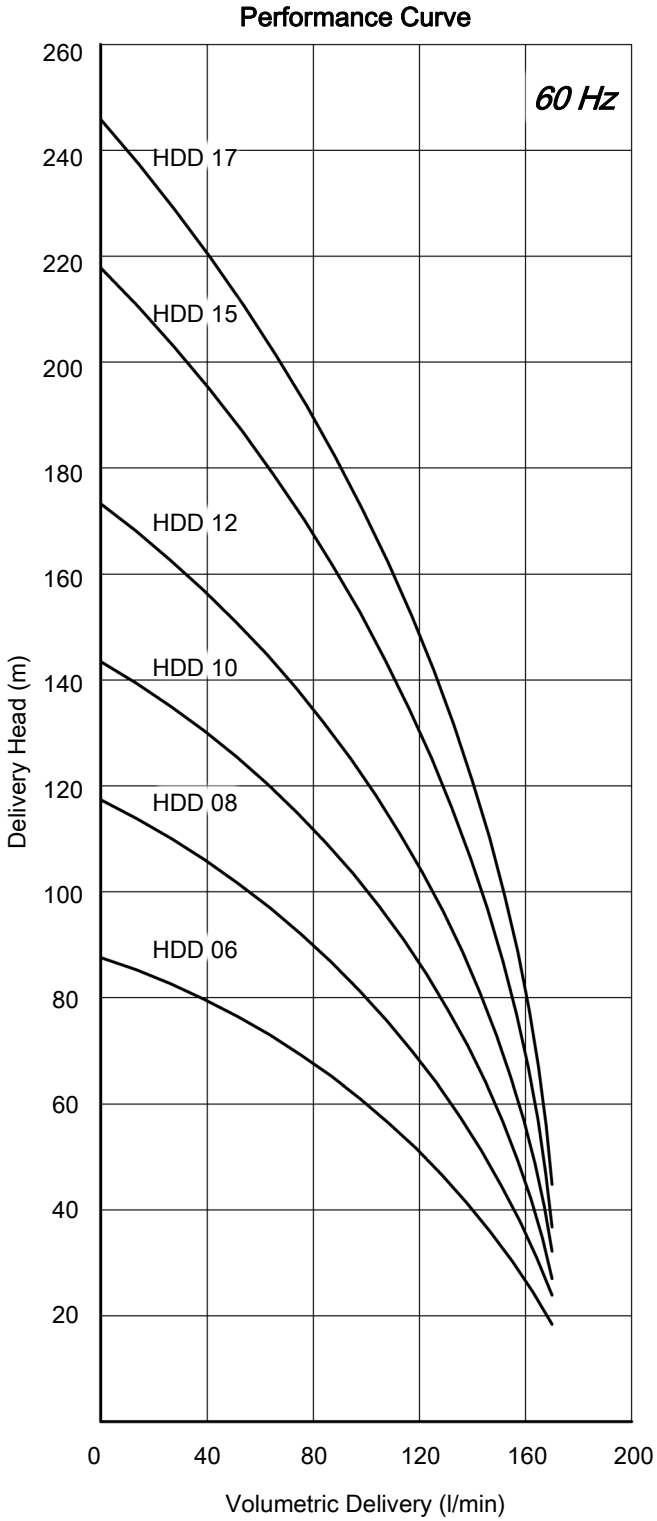
** Curve tolerance according to ISO 9906:2012 Grade 3B.



DIMENSIONS & NOMINAL VALUES

60 Hz

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HDD 08	316	176	680	139	30.0	2.6	265/460	60 Hz	7.79/4.5	3490
HDD 10	316	194	712	150	36.5	3.6			10.4/6.0	3495
HDD 12	420	194	816	150	41.0	4.8			13.5/7.8	3485
HDD 15	420	194	816	150	41.5	4.8			13.5/7.8	3485
HDD 17	524	218	933	163	47.0	6.6			18.4/10.6	3520



HED PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 23 bar pressure,
- Circulation systems. HED Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s (cSt)

Materials:

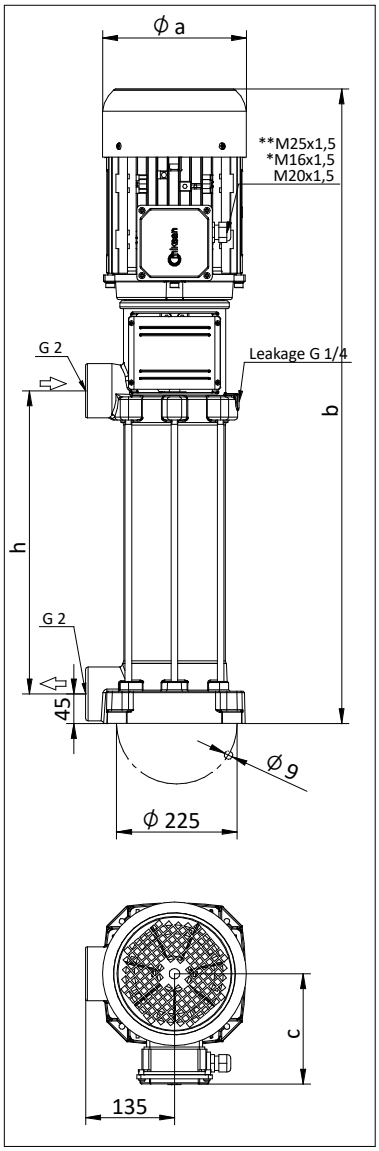
Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

* M16x1,5 cable gland is used on HED 02 and HED 03 pumps.

** M25x1,5 cable gland is used on HED 16, HED 18 and HED 20 pumps.

*** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

**** Curve tolerance according to ISO 9906:2012 Grade 3B.

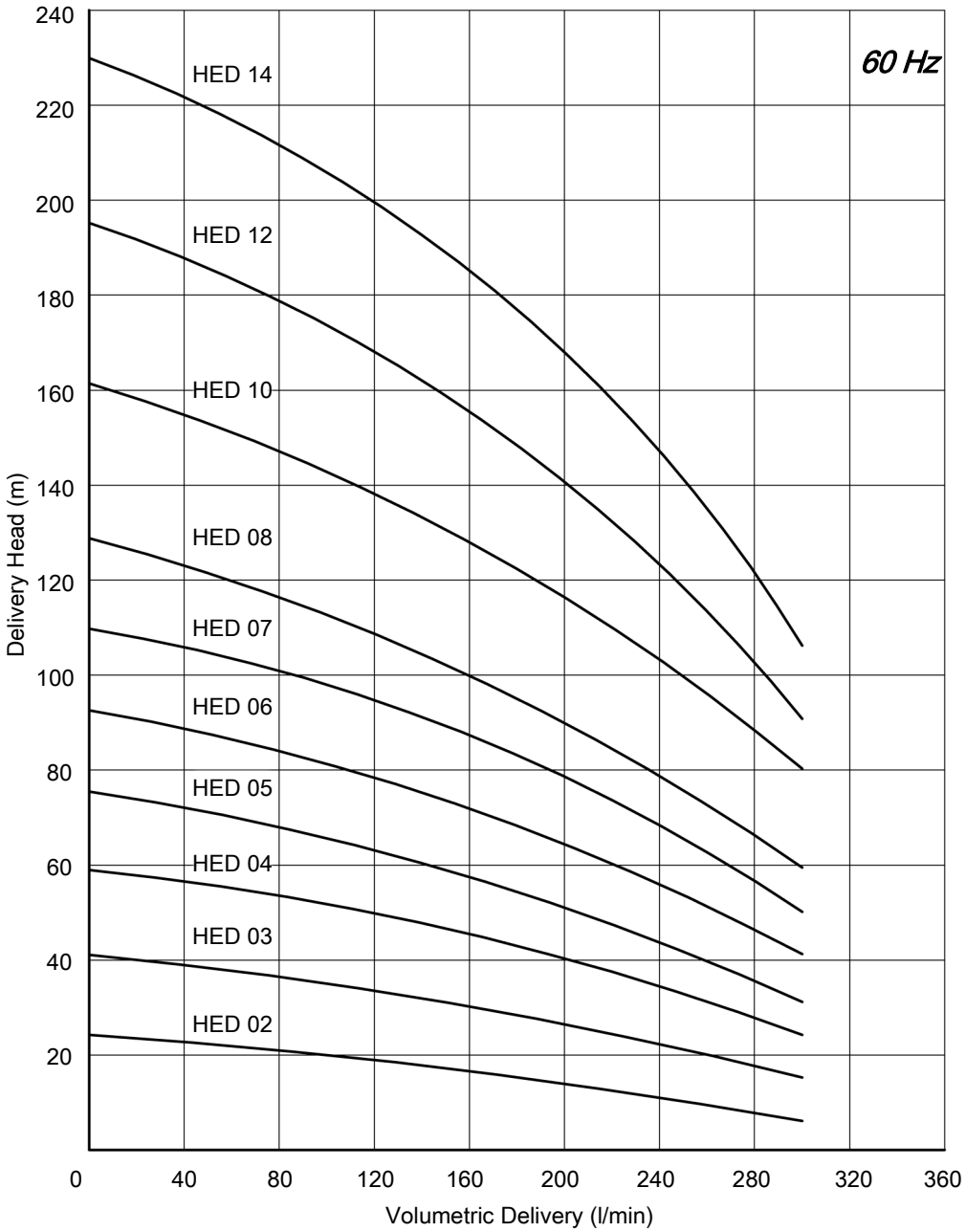


DIMENSIONS & NOMINAL VALUES

60 Hz

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HED 02	269	176	705	139	38.0	1.8	265/460	60 Hz	5.72/3.3	3490
HED 03	269	176	730	139	41.5	2.65			7.79/4.5	3490
HED 04	269	194	762	150	48.0	3.6			10.4/6.0	3495
HED 05	269	194	762	150	48.5	3.6			10.4/6.0	3495
HED 06	350	194	843	150	52.0	4.8			13.5/7.8	3485
HED 07	350	218	856	163	58.5	6.6			18.4/10.6	3520
HED 08	350	218	856	163	59.0	6.6			18.4/10.6	3520
HED 10	460	258	1021	177	84.0	9.0	460 Δ		13.5	3505
HED 12	460	258	1021	177	84.5	9.0			13.5	3505
HED 14	568	258	1159	177	95.0	13.2			19.7	3510

Performance Curve



HFD PUMP

60 Hz

Applications:

- Cutting, turning, milling, boring, grinding and similar applications of the machine tools,
- Especially used for deep hole boring operations due to supply 25 bar pressure,
- Circulation systems. HFD Pumps are used for pumping of cutting / cooling fluids.

Fluid Specifications:

- Coolants,
- Cutting oils,
- Grinding oils,
- Water,
- Fluid temperature 0...80 °C
- Kinematic viscosity 1...30 mm^2/s (cSt)

Materials:

Pump body	: Cast iron - DIN GG 25
Cover	: Cast iron - DIN GG 25
Diffuser	: Stainless steel - DIN 4301 (AISI 304)
Impeller	: Stainless steel - DIN 4301 (AISI 304)
Strainer	: Stainless steel - DIN 4301 (AISI 304)
Pump shaft	: Stainless steel - DIN 4401 (AISI 316)
O-ring	: Viton
Mechanical seal	: C - SiC - Viton TC - TC - Viton (Optional)
Electric motor	: 3 phase induction motor IE3 - 2 pole, Protection degree IP 55

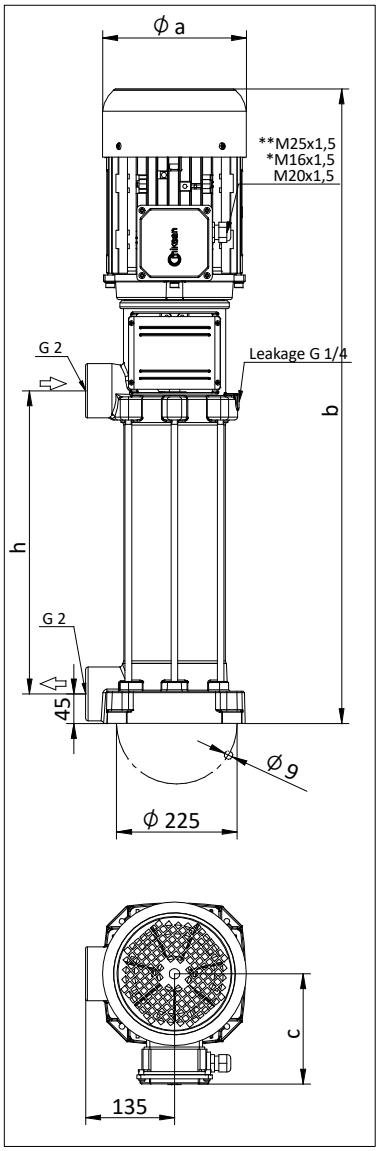
* M20x1,5 cable gland is used on HFD 02 and HFD 03 pumps

. ** M25x1,5 cable gland is used on HFD 04 to HFD 08 pumps.

*** M32x1,5 cable gland is used on HFD 04 to HFD 08 pumps.

**** The performance curves are based on 1 mm^2/s (cSt) kinematic viscosity values and 997 kg/m^3 density

***** Curve tolerance according to ISO 9906:2012 Grade 3B.

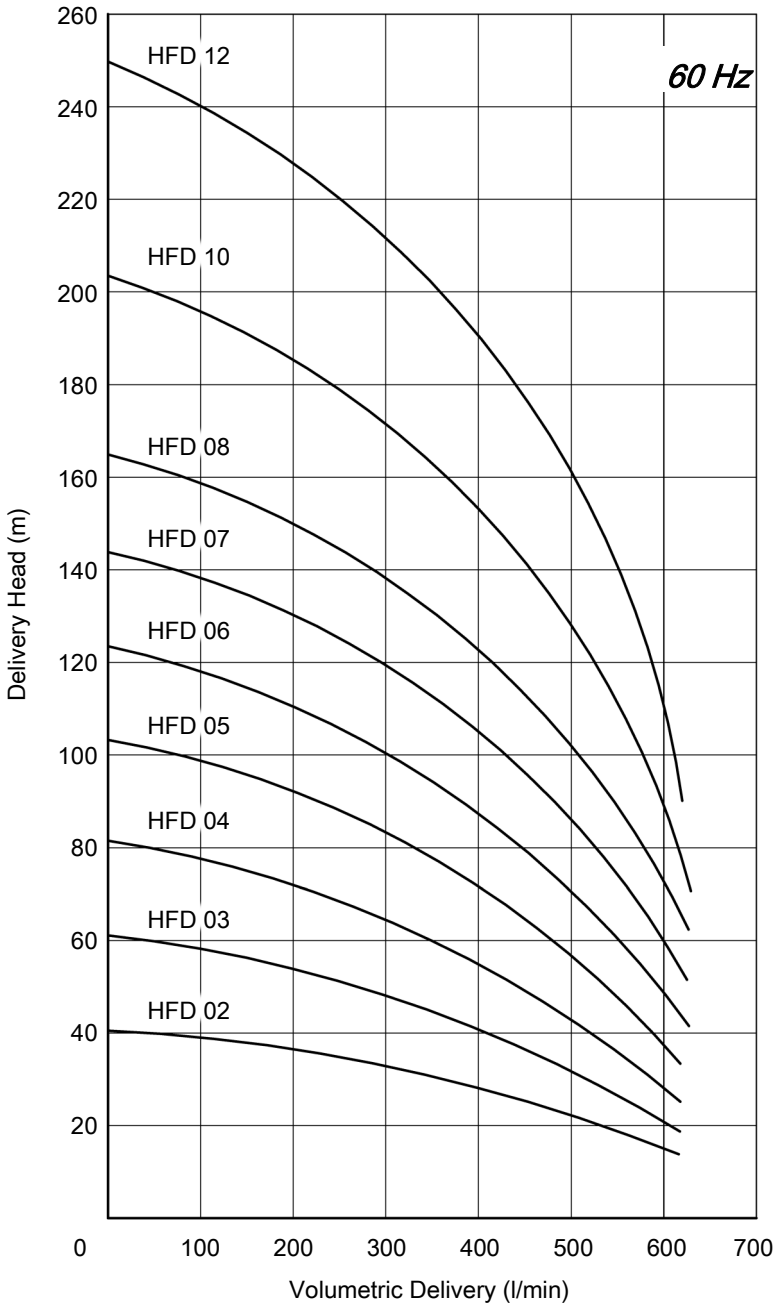


DIMENSIONS & NOMINAL VALUES

60 Hz

TYPE	Length h (mm)	a mm	b mm	c mm	Weight kg	Power kW	Voltage V(Δ/Y)	Frequency Hz	Rated current A	Speed rpm
HFD 02	300	176	802	139	42.5	4.8	265/460	50	13.5/7.8	3485
HFD 03	300	194	802	150	43.0	4.8			13.5/7.8	3485
HFD 04	300	194	990	150	79.0	9.0	460 Δ		13.5	3505
HFD 05	300	218	990	163	79.5	9.0			13.5	3505
HFD 06	404	258	1124	177	84.5	13.2			19.7	3510
HFD 07	404	258	1124	177	85.0	13.2			19.7	3510
HFD 08	404	258	1124	177	100.5	17.4			26.7	3540
HFD 10	542	316	1372	224	124.0	22.2			31.7	3525
HFD 12	542	316	1372	224	125.0	22.2			31.7	3525

Performance Curve

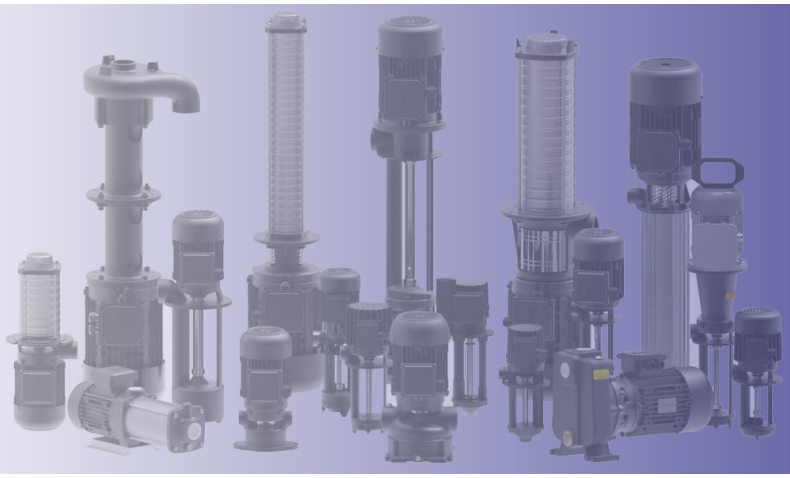


PUMPS		HC	HCA	HCB	HD	HDA	HDB	HEB	HFB	HCD	HDD	HED	HFD
Pump Specifications	Mounting Position	Hor.	Vertical (immersed)		Hor.	Vertical (immersed)				Vertical			
	Impeller Type	Closed											
	Housing	Cast Iron											
	Diffuser	Stainless Steel											
	Shaft	Stainless Steel											
	Impeller	Stainless Steel											
	Mechanical Seal	C - SiC - Viton (TC-TC-Viton option)											
	Pipe Connection	G 1	G 1	G 1	G 1	G 1	G 1	G 2	G 2	G 1	G 1	G 2	G 2
	H_{max} (m)	70	70	250	60	60	250	235	235	250	250	235	235
	Q_{max} (l/min)	85			150			300	500	85	150	300	500
	H_{opt} (m)	Please look at the product pages for optimum working ranges.											
	Q_{opt} (l/min)	35			70			170	300	35	70	170	300
Motor	Power (kW)	0,37 I 1,1	0,37 I 1,1	1,1 I 4,0	0,55 I 1,1	0,55 I 1,1	1,1 I 5,5	1,1 I 11,0	2,2 I 15,0	1,1 I 4,0	1,1 I 5,5	1,1 I 11,0	2,2 I 15,0
	Protection Degree	IP 55											
	Isolation Class	F											
Fluid Specifications	Kinematic Viscosity	1...30 mm^2/s (cSt)											
	Temperature	0...80 °C											
	Chip Size - max	2 mm											
	Cutting Oils	+	+	+	+	+	+	+	+	+	+	+	+
	Grinding Oils	+	+	+	+	+	+	+	+	+	+	+	+
	Coolants	+	+	+	+	+	+	+	+	+	+	+	+
	Water	o	o	o	o	o	o	o	o	o	o	o	o
	Thermal Oils	+	+	+	+	+	+	+	+	+	+	+	+
	Chemical Liquids	-	-	-	-	-	-	-	-	-	-	-	-
Applications	Cutting	+	+	+	+	+	+	+	+	+	+	+	+
	Boring	+	+	+	+	+	+	+	+	+	+	+	+
	Turning	+	+	+	+	+	+	+	+	+	+	+	+
	Milling	+	+	+	+	+	+	+	+	+	+	+	+
	Grinding	o	o	o	o	o	o	o	o	o	o	o	o
	Deep Hole Boring	-	-	+	-	-	+	+	+	+	+	+	+
	Erosion	+	+	+	+	+	+	+	+	+	+	+	+
	Filtration Systems	+	+	+	+	+	+	+	+	+	+	+	+
	Circulation Systems	+	+	+	+	+	+	+	+	-	-	-	-
Page	50 Hz	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27
	60 Hz	28-29	30-31	32-33	34-35	36-37	38-39	40-41	42-43	44-45	46-47	48-49	50-51

Description of the signs : + Applicable - Not applicable o Contact us before selection

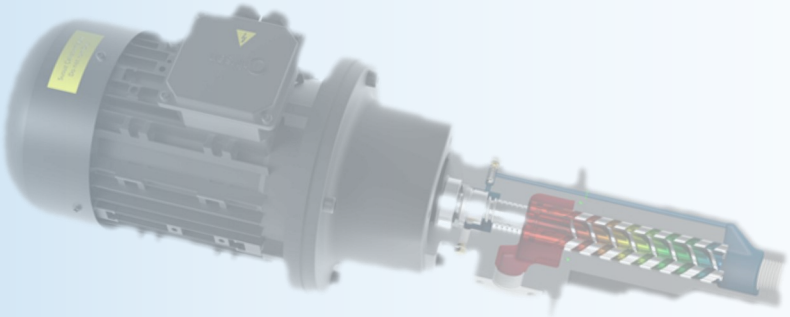
H Series Multistage Pump Catalogue

05.24



Coolant Pump Catalogue

Screw Pump Catalogue



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