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KNOLL centrifugal pumps are available as submersible or block pumps. These continuous-flow machines are primarily used on machine tools to convey cooling lubricants.

As return pumps, they transport the chips/cooling lubricant mixture to filters/separators. They then supply the machines again with the cleaned cooling lubricant. Thanks to their solid and robust design, KNOLL cooling lubricant pumps have a high load capacity and long durability.

There are six different designs:

TG with closed impeller for cleaned cooling lubricant with residual contamination

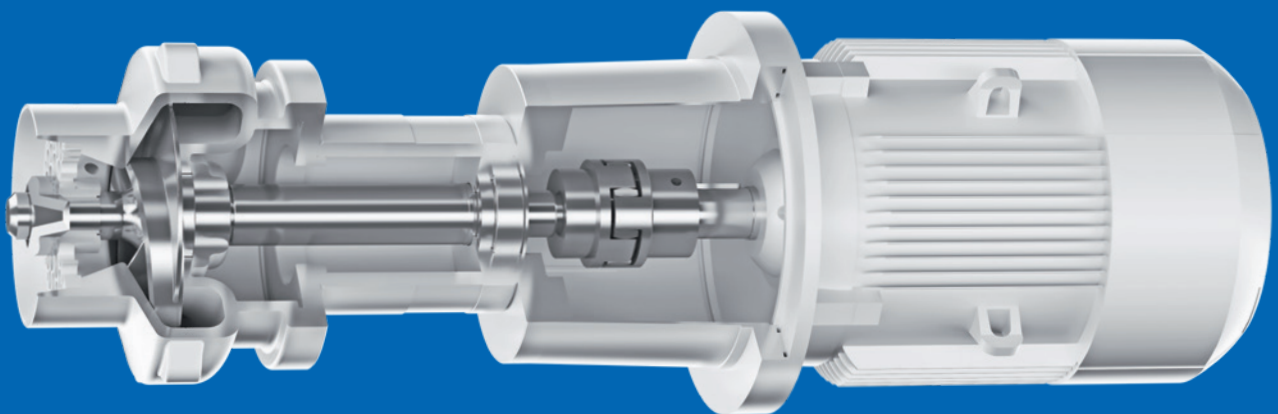
TF with free-flow impeller for contaminated cooling lubricant with short chips

TS/TSK with screw impeller for contaminated cooling lubricant with air

TSL with semi-open radial impeller for contaminated cooling lubricant with short chips

TSC with semi-open radial impeller and cutter for contaminated cooling lubricant with long aluminium chips

BS with semi-open radial impeller for contaminated cooling lubricant with high air content



Type key

TSC 65–63/75 360



Application example: TSC 65–63/75 360

TSC	Pump type	
65	Overall size	
63	Impeller index	dia. 163 mm
75	Motor output	7.5 kW
360	Depth of immersion	360 mm

Drives

Standard multi-range motors, 2-pole, thermal class ISO-F, IP55 rating, IE3

0.75 kW to 5.5 kW	7.5 kW
230 V (Δ) / 400 V (Y), 50 Hz, 2900 rpm	400 V (Δ) / 690 V (Y), 50 Hz, 2900 rpm
400 V (Y) / 460 V (Y), 60 Hz, 3500 rpm	400 V (Δ) / 460 V (Δ), 60 Hz, 3500 rpm

Other voltages available on request.

Technical data of the standard IEC/EN 60034

In order to keep the load on the pump and motor as low as possible, the maximum switching frequency should not be exceeded.

Rated output	Maximum switching frequency
0.1 kW to 2.6 kW	60x/hour
3.0 kW to 5.5 kW	40x/hour
7.5 kW to 10.0 kW	20x/hour
>10.0 kW	15x/hour

Note: The characteristic curves shown below are based on frequencies of 50/60 Hz and cooling lubricant emulsion. Characteristic curves for other media, speeds and viscosities are available on request. The recommended range is marked with dashed lines.

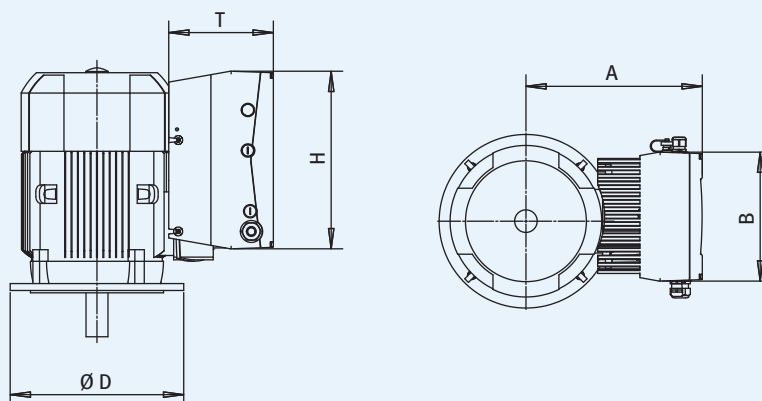
Frequency inverter (FI) 0.75 – 7.5 kW

Benefits

- Compact design thanks to installation of the FI on the terminal box of the motor (piggyback).
- Control system incorporates KNOLL control expertise.

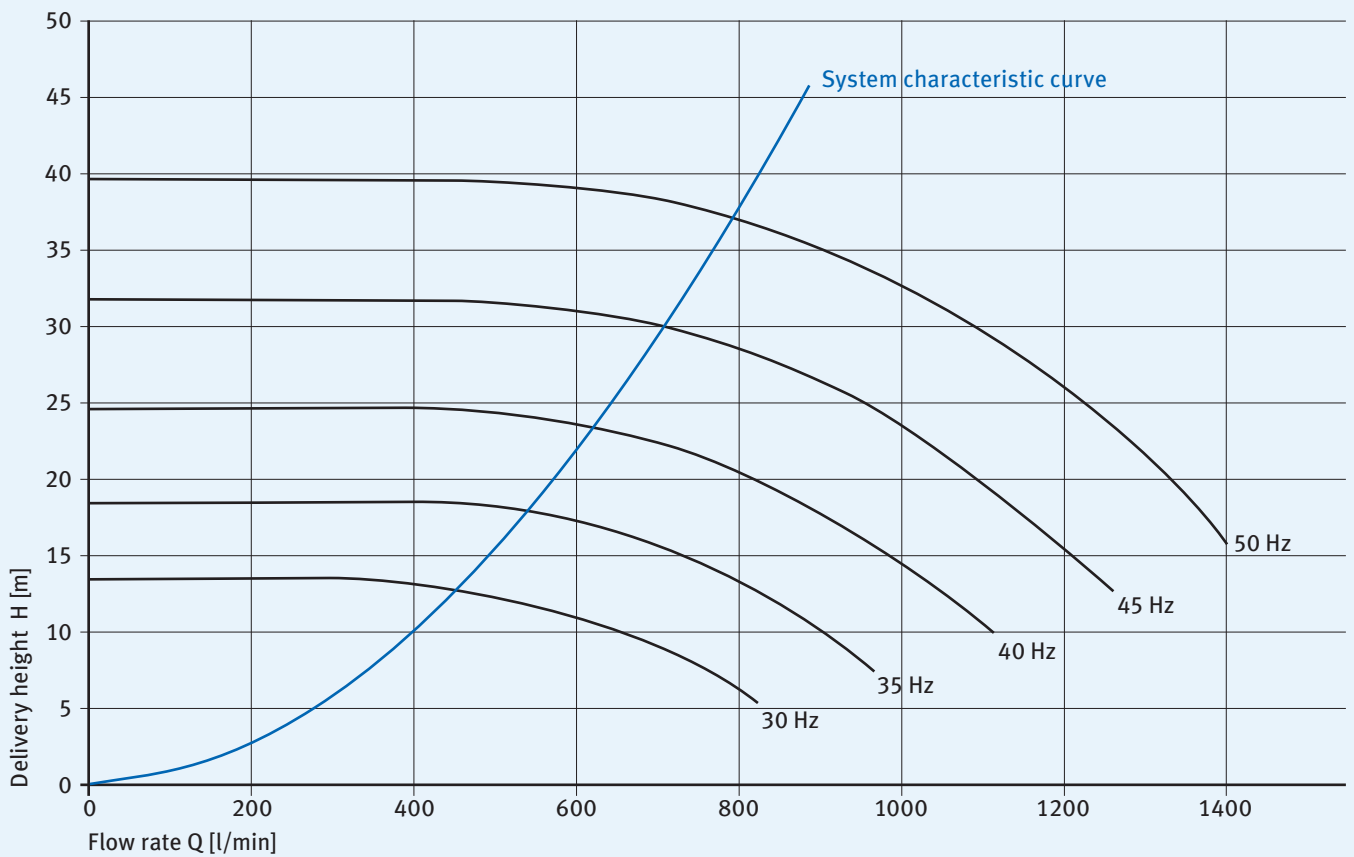
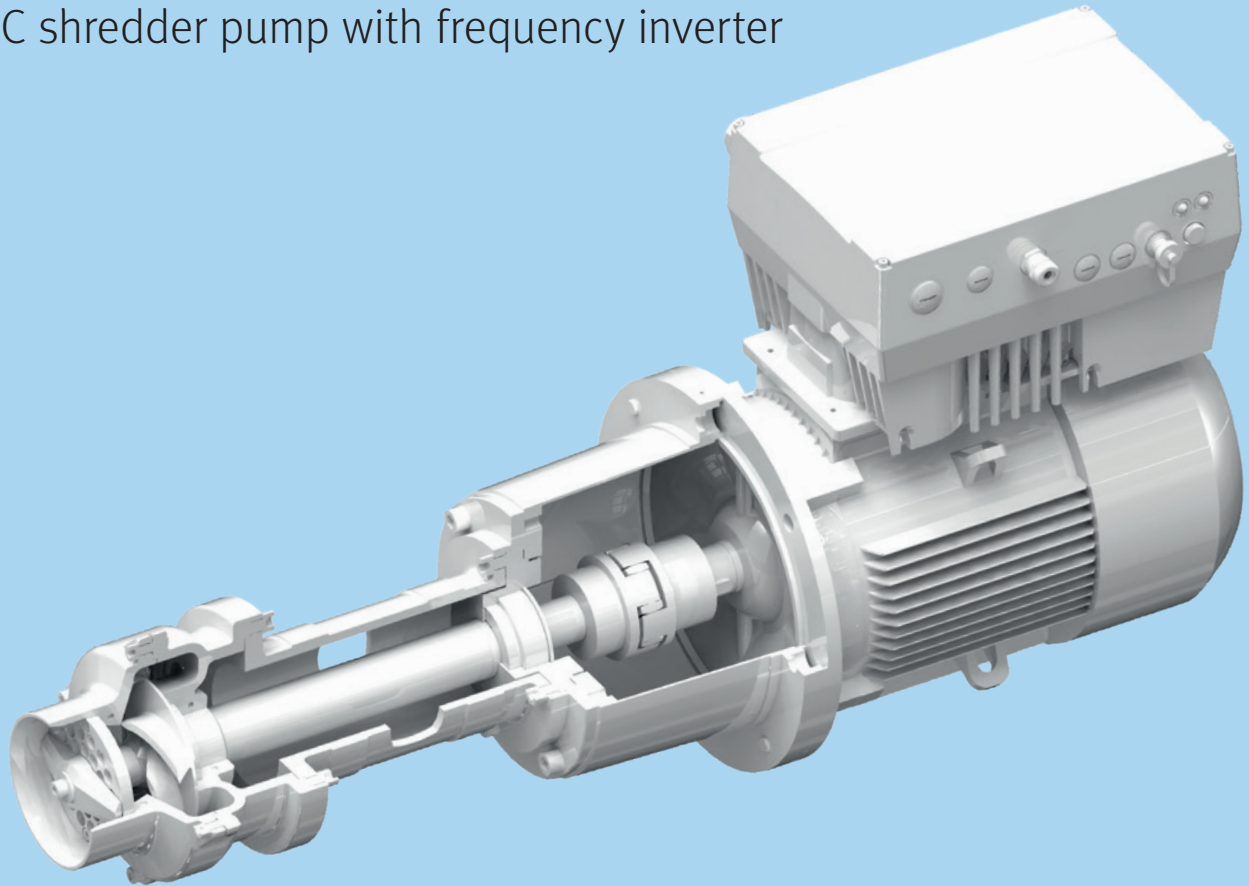
Recommended motor output [kW]	0.75	1.1	1.5	2.2	3.0	4.0	5.5	7.5
Mains current [A]	1.9	2.6	3.3	4.6	6.2	7.9	10.8	14.8
Rated output current [A] with 400 V/8 kHz	2.3	3.1	4.0	5.6	7.5	9.5	13.0	17.8
Size	A			B			C	
Weight incl. worktop [kg]	3.9			5.0			8.7	
Protection rating	IP 65							
Max. overload for 60 sec [%]	150							
Mains voltage	3 AC 400 V -15% to 480 V +10%							
Mains frequency	50 / 60 Hz ±6%							
EMC approval	Complies with DIN EN 61800-3, Class C2							
Certificate and conformity	CE and UL							
Temperature range	-25 °C (without condensation) to +50 °C (without derating)							
Protective functions	Overvoltage/undervoltage, I ² t limiting, short circuit, motor temperature, inverter temperature, tilt protection, anti-lock system							
Output frequency range	0 – 400 Hz							
Digital inputs	4							
Fixed frequency	7							
Digital outputs	2							
Analogue inputs	2 analogue inputs (0/2 – 10 V, 0/4 – 20 mA)							
Analogue outputs	0 – 10 V (-I _{max} = 10 mA) or 0 – 20 mA (-load R = 500 Ω)							
Process control	Freely configurable PID controller							
Relay outputs	2 make contacts, 250 V AC 2 A							
USB interface	USB on M12 connector (RS485/RS232 converter)							
Handheld terminal (optional)	MMI with lead							
Bus modules (optional)	Profibus DP, CANopen, EtherCAT							
Secure grip	Optional							

Dimensions



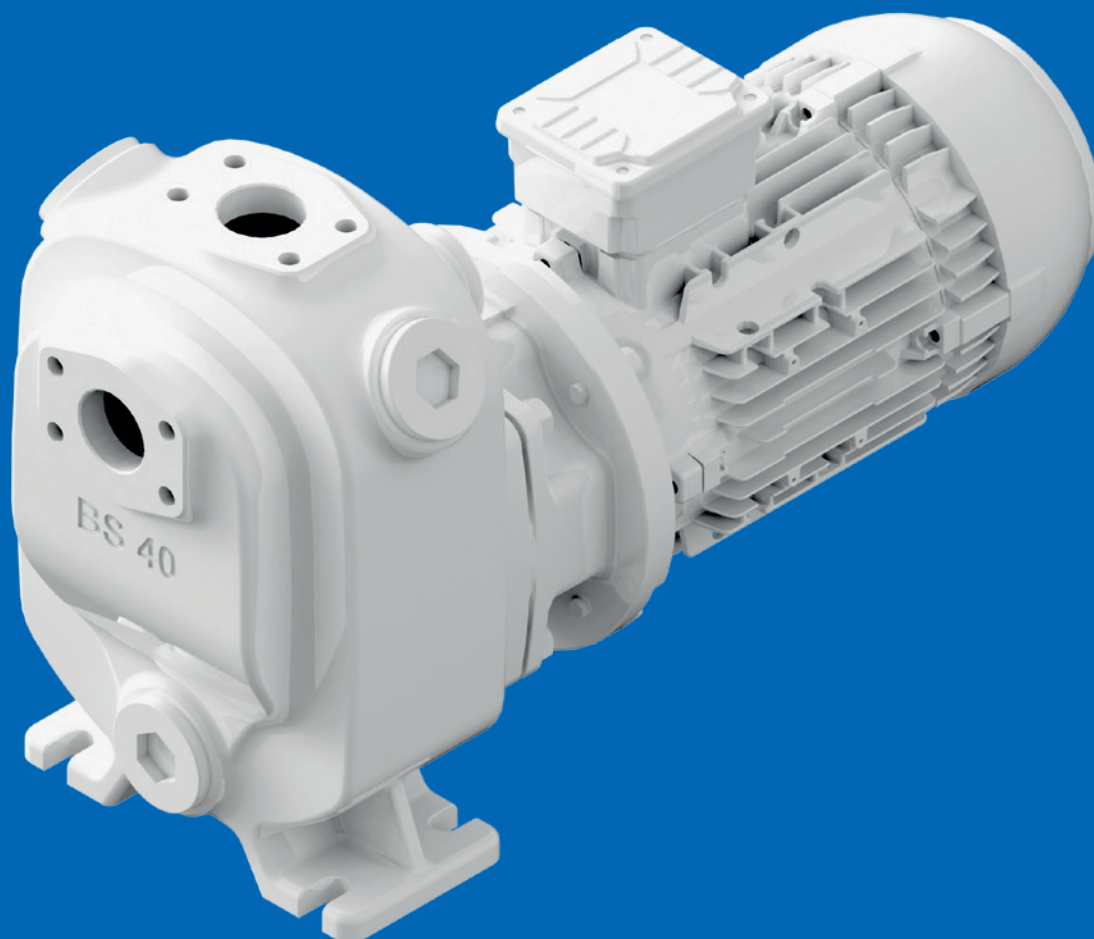
Motor output [kW]	Overall size	Key dimensions [mm]				
		A	B	D	H	T
0.75 - 1.5	A	205	153	200	233	120
2.2	B	230	189	200	270	140
3.0	B	235	189	250	270	140
4.0	B	245	189	250	270	140
5.5 - 7.5	C	310	223	300	307	181

Design example: TSC shredder pump with frequency inverter



Block pumps

The self-priming KNOLL BS series block pumps convey contaminated cooling lubricants with a high air content. Thanks to their solid and robust design, KNOLL block pumps are extremely reliable and have a long service life.



Properties

- Dry mounted
- Self-priming
- Flexible design with standard-dimensioned motor
- Energy efficient in combination with a frequency inverter
- Flow-optimised casing with impeller
- High-quality and wear-resistant mechanical seal
- Quick suction time
- Variable connection option for pressure-side pipework

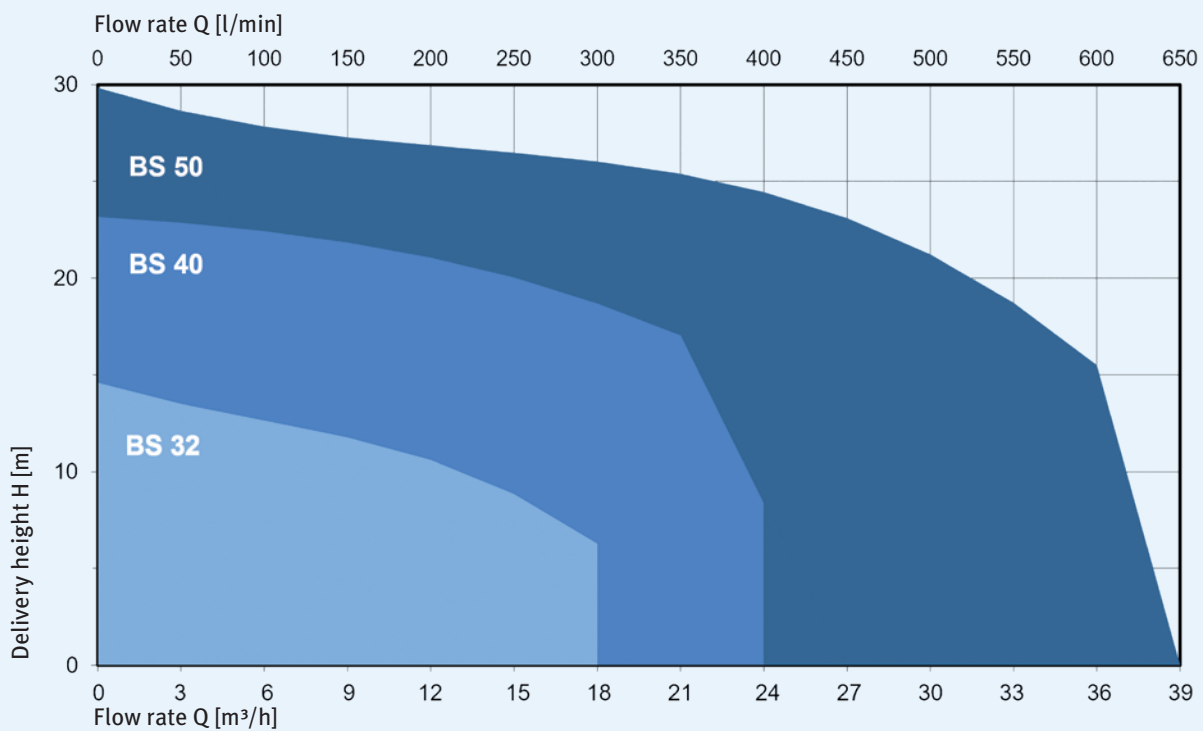
Maximum performance data

Type	Volume flow [l/min]	Delivery height [m]	Grain size [mm]
BS 32	260	14	8
BS 40	380	24	10
BS 50	550	28	10

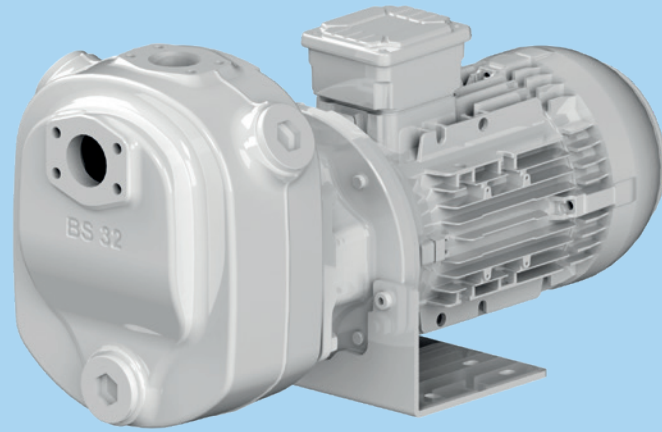
Connections

Type	Pressure connection	Suction connection	Filling port
BS 32	SAE 1-1/4"	SAE 1-1/4"	G 1-1/4"
BS 40	SAE 1-1/2"	SAE 1-1/2"	G 1-1/2"
BS 50	SAE 2"	SAE 2"	G 2"

Characteristic curve diagram



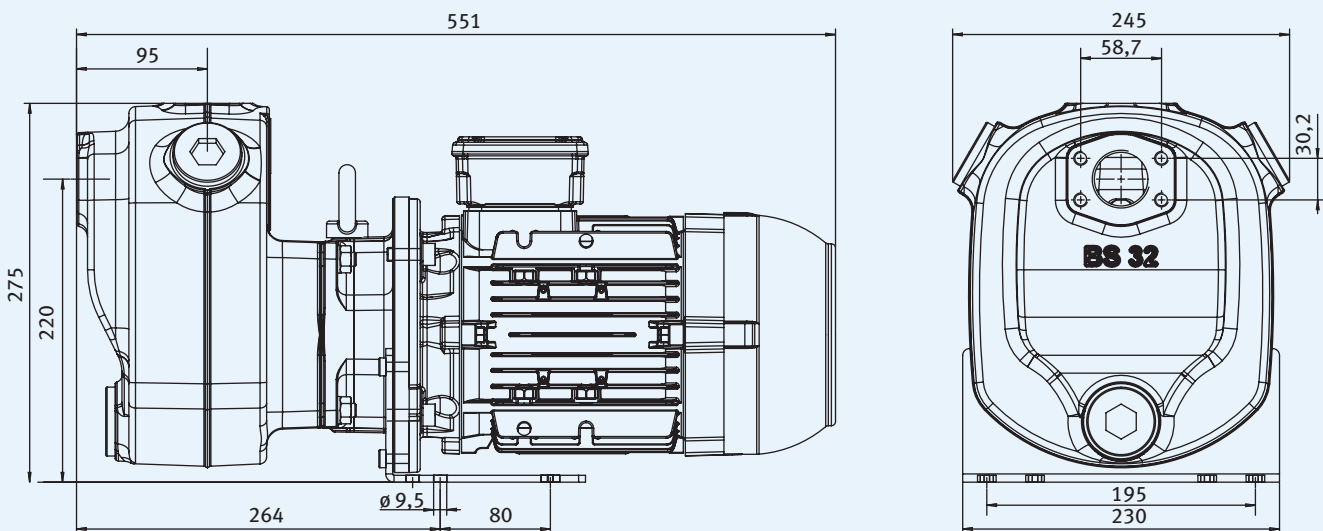
BS 32 self-priming pump



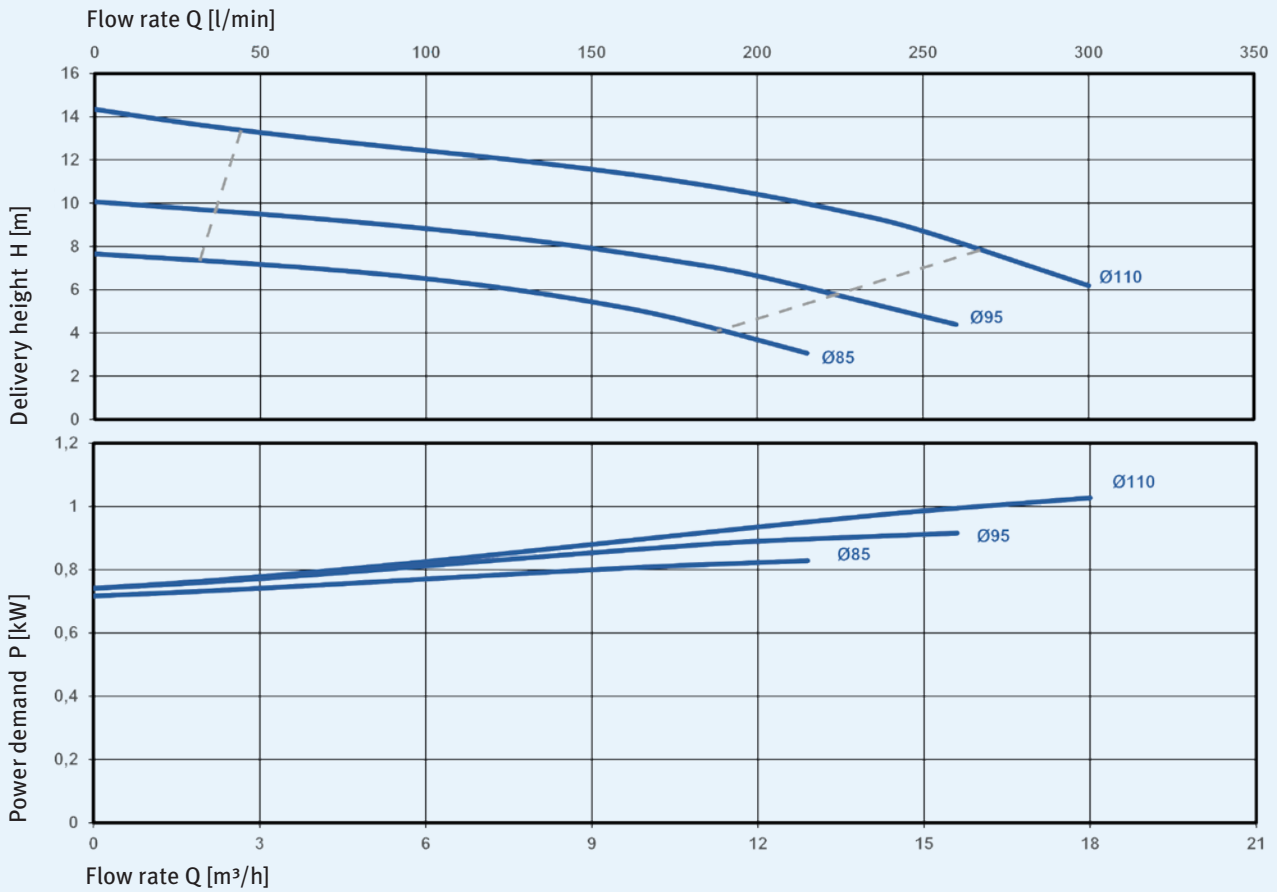
Variations

Type	Motor output [kW]	Frequency [Hz]	Weight [kg]
BS 32-10/15	1.5	50	38
BS 32-95/15	1.5	50/60	38
BS 32-85/15	1.5	50/60	38

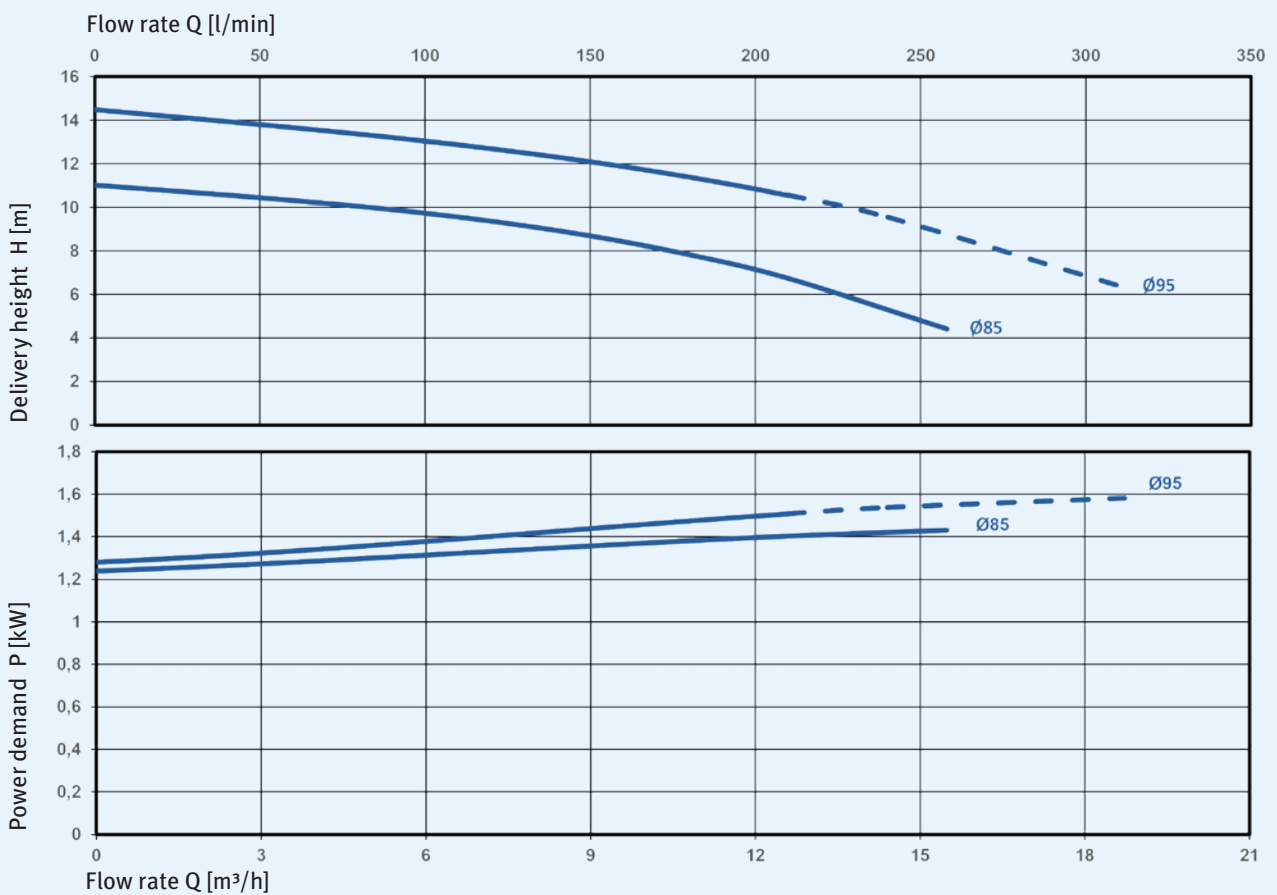
Dimensions



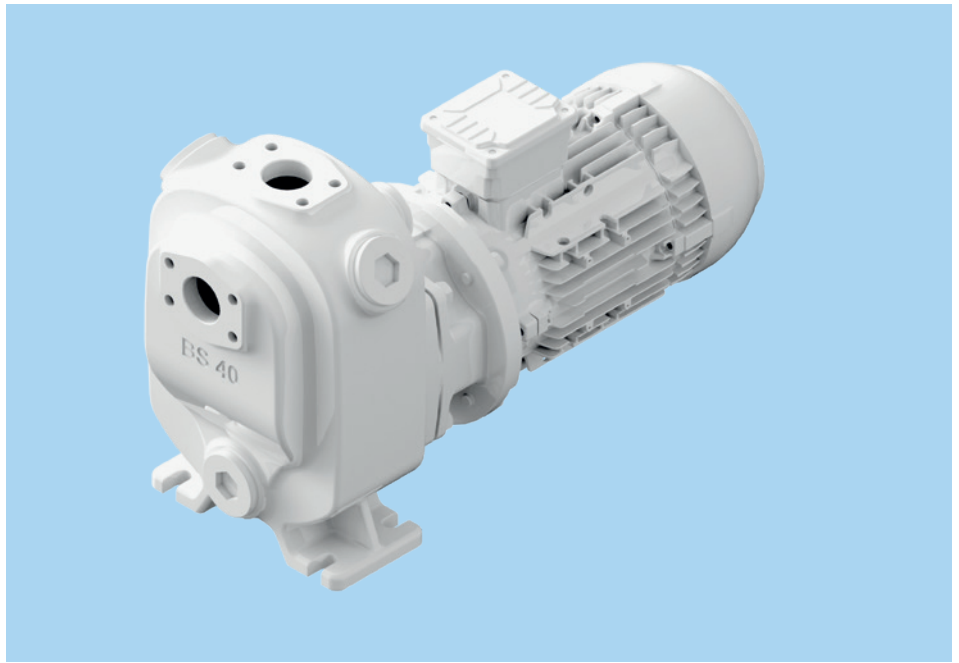
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



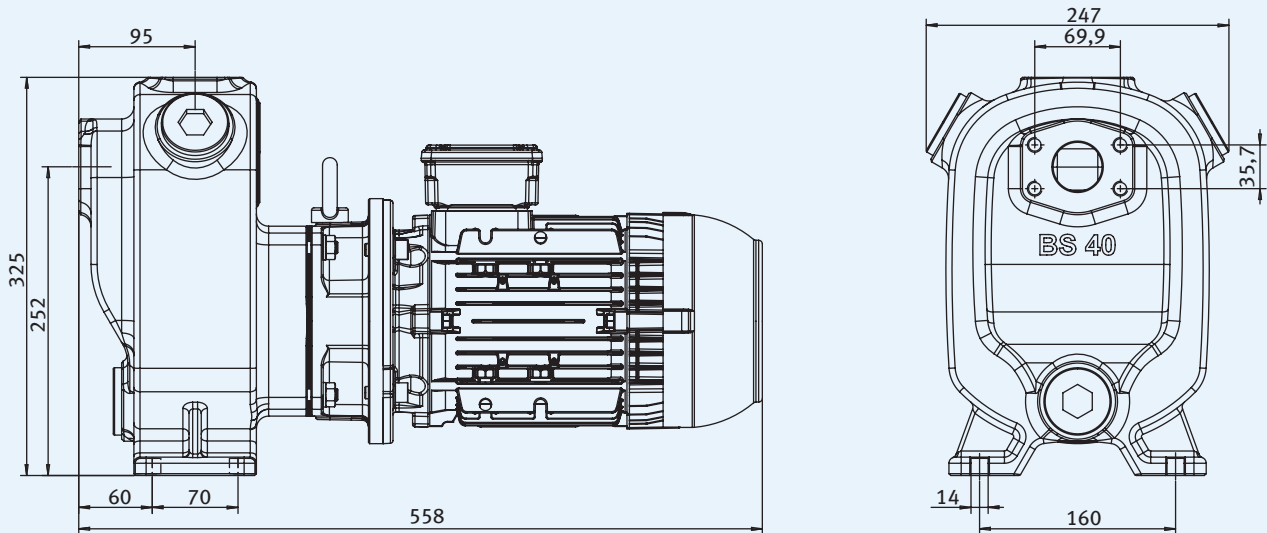
BS 40 self-priming pump



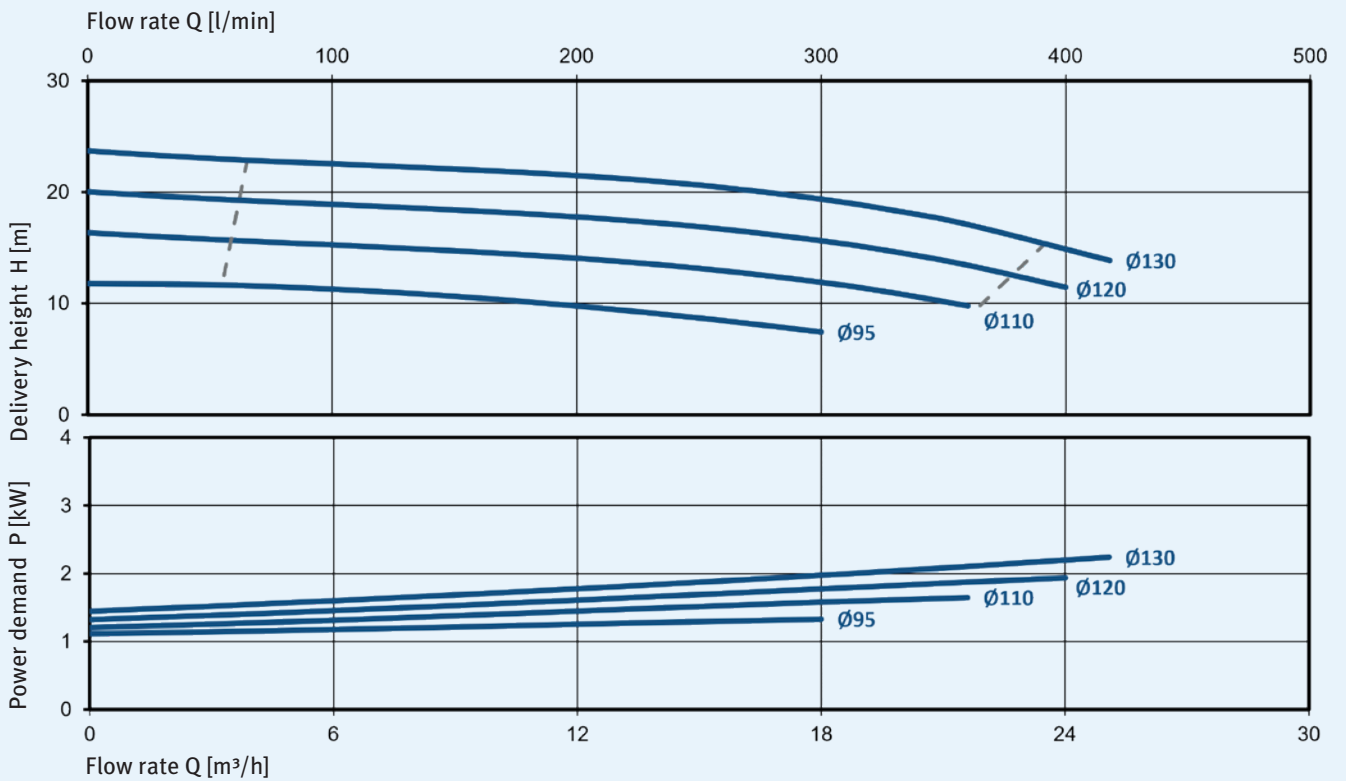
Variations

Type	Motor output [kW]	Frequency [Hz]	Weight [kg]
BS 40-30/22	2.2	50	50
BS 40-20/22	2.2	50	50
BS 40-10/22	2.2	50/60	50
BS 40-95/22	2.2	50/60	50

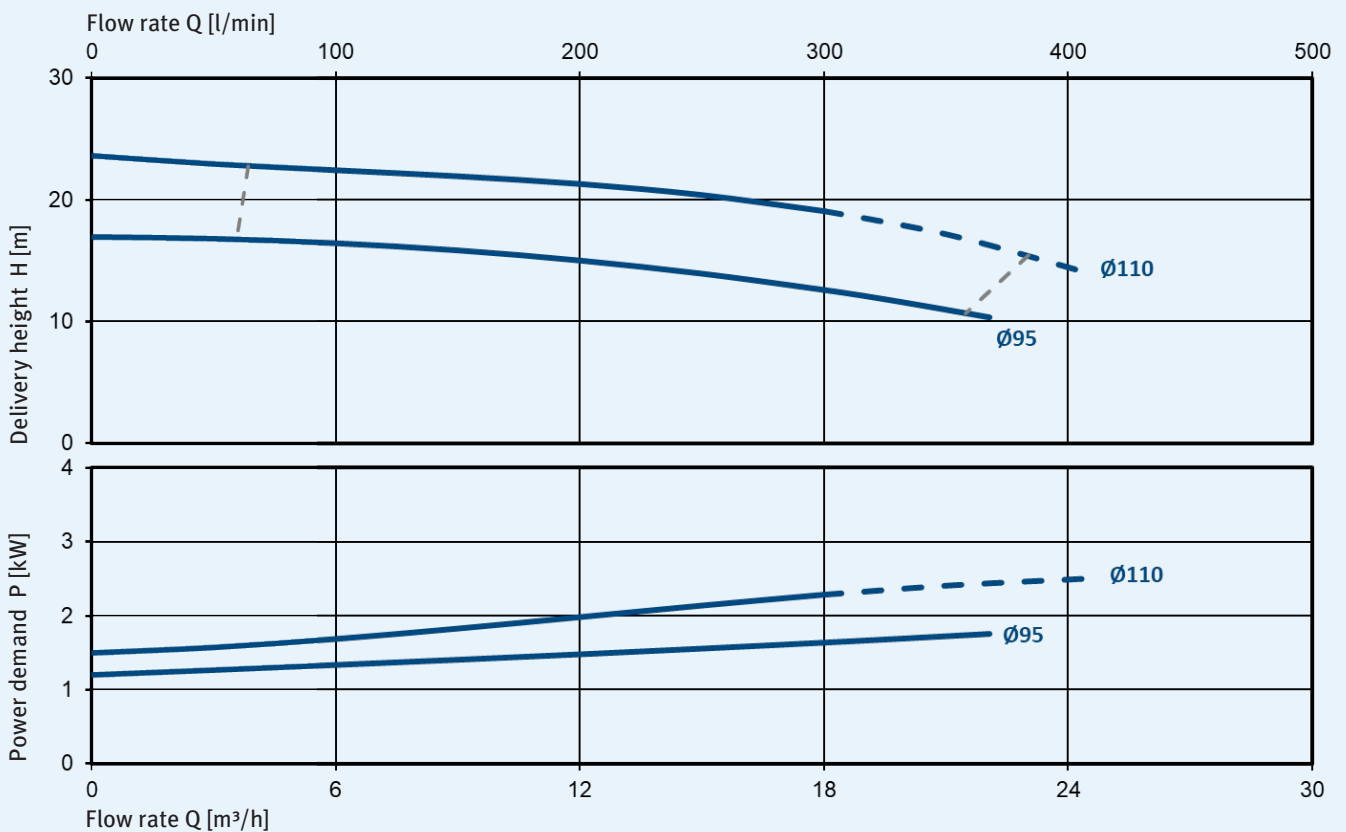
Dimensions



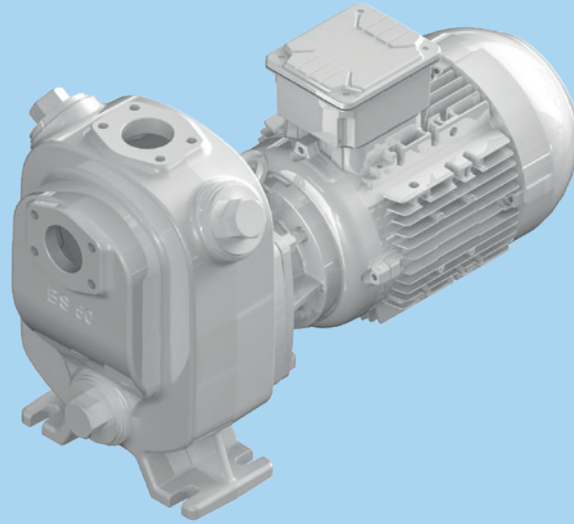
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



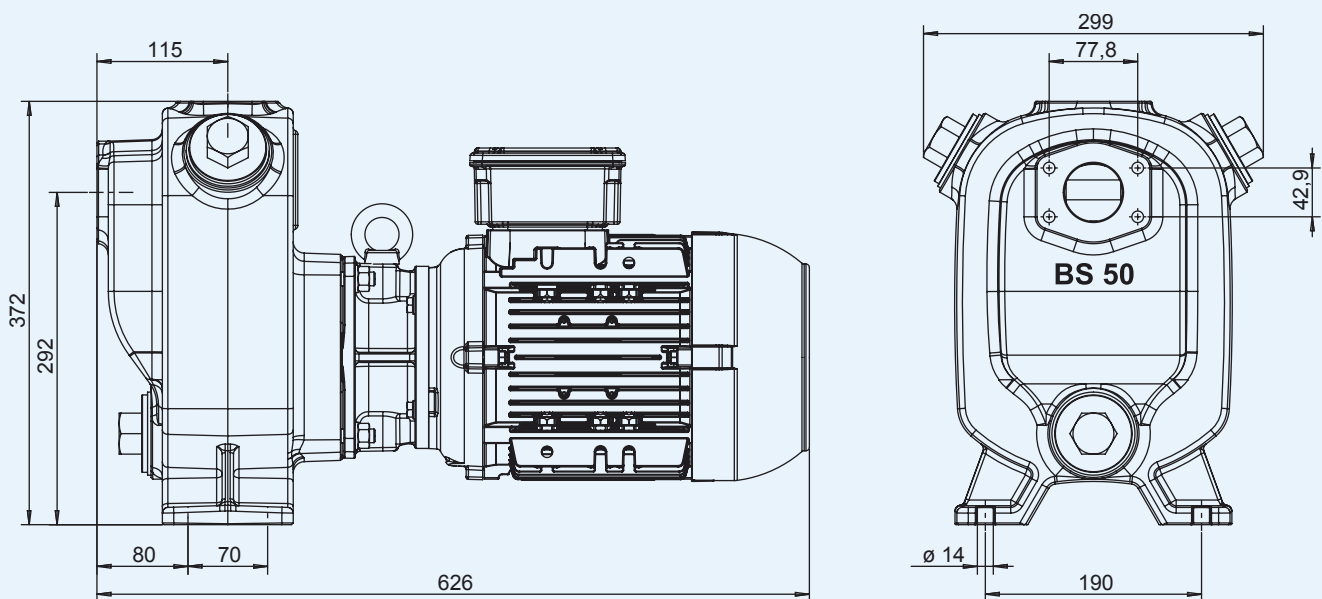
BS 50 self-priming pump



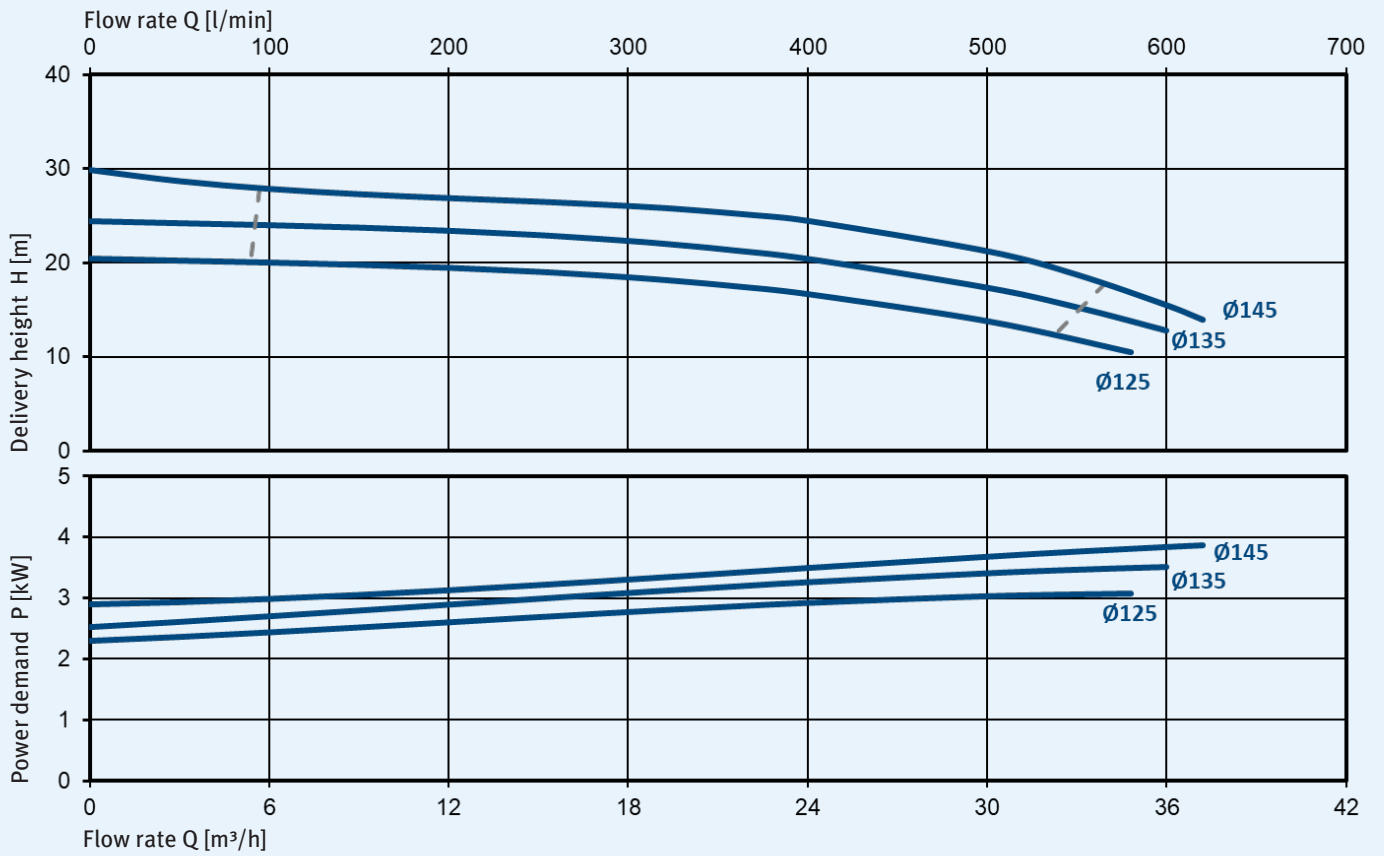
Variations

Type	Motor output [kW]	Frequency [Hz]	Weight [kg]
BS 50-45/40	4.0	50	76
BS 50-35/40	4.0	50	76
BS 50-25/30	3.0	50	66
BS 50-25/40	3.7	60	76
BS 50-15/40	3.7	60	76

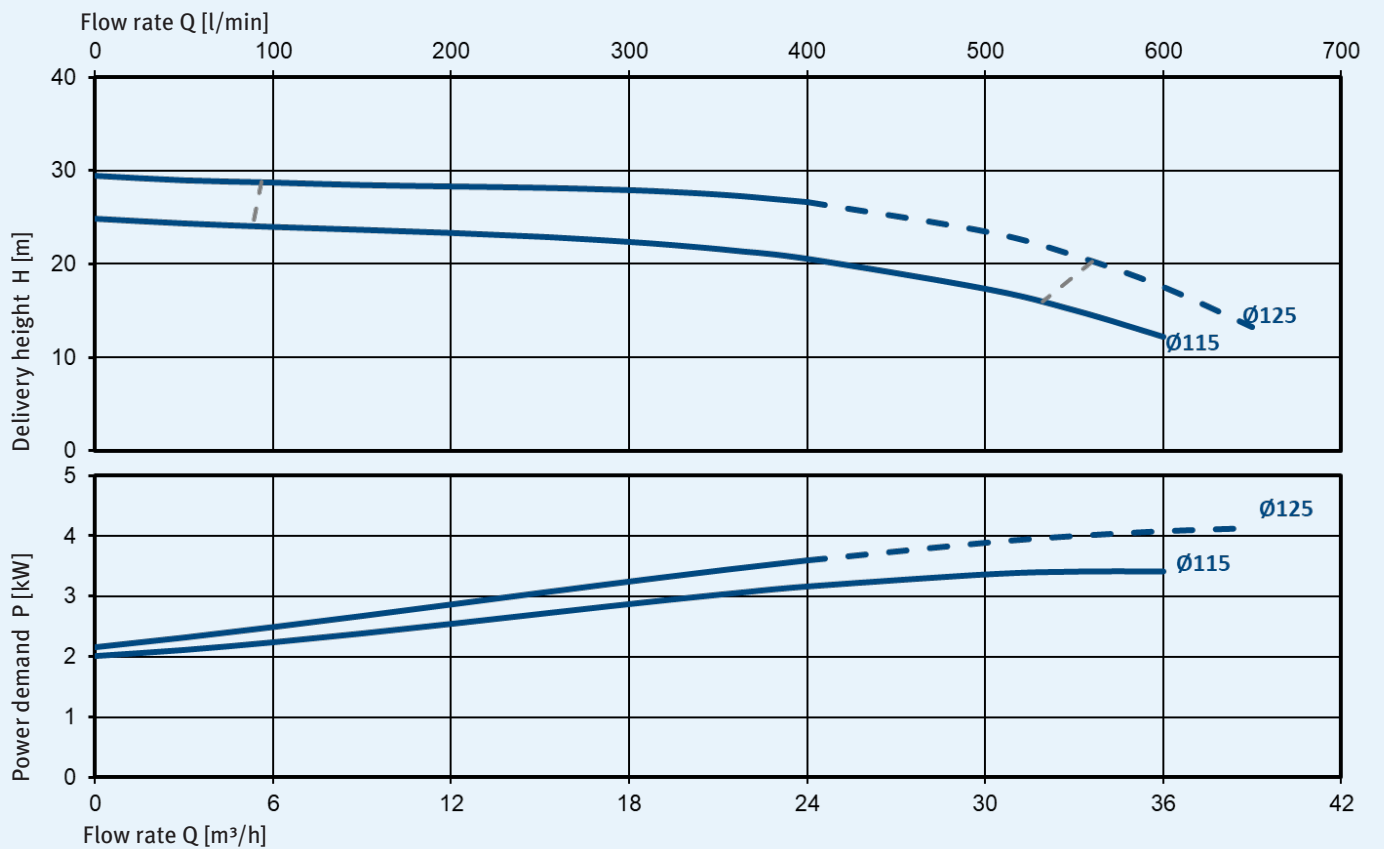
Dimensions



Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s

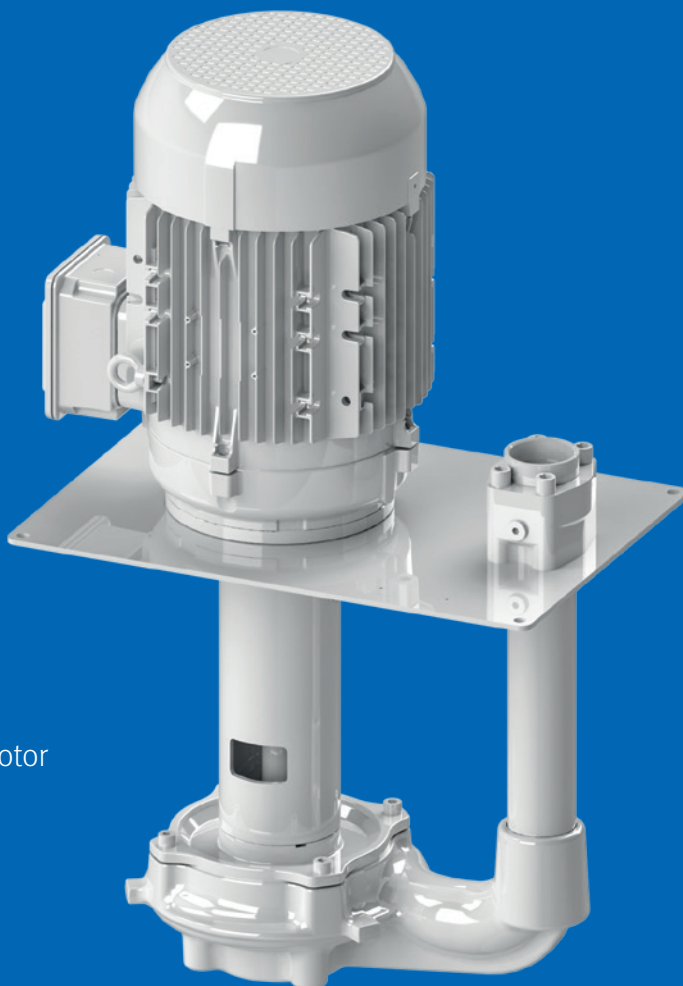


Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



Clean medium pumps

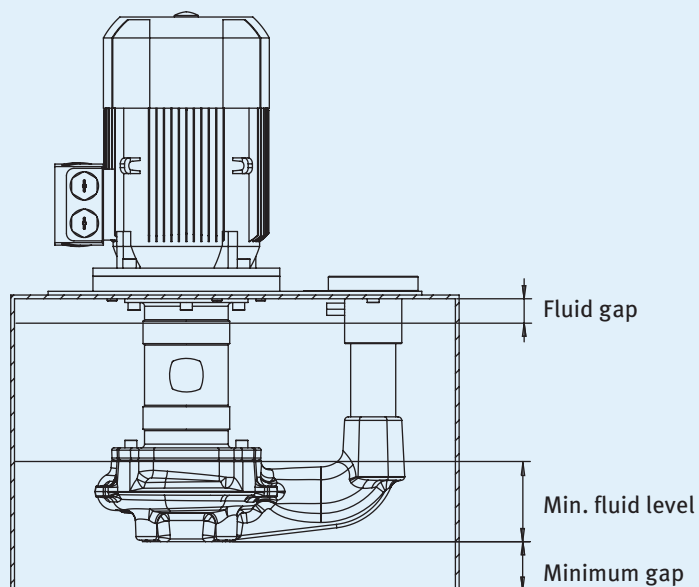
KNOLL TG clean medium pumps are cooling lubricant pumps that convey media with light contamination. These pumps are able to supply machines with cleaned cooling lubricant.



Properties

- No gaskets
- Flexible design with standard-dimensioned motor
- Energy efficient in combination with a frequency inverter
- Extremely high efficiency thanks to impeller flow design
- POM/GJL-250 impeller material

Dimensions



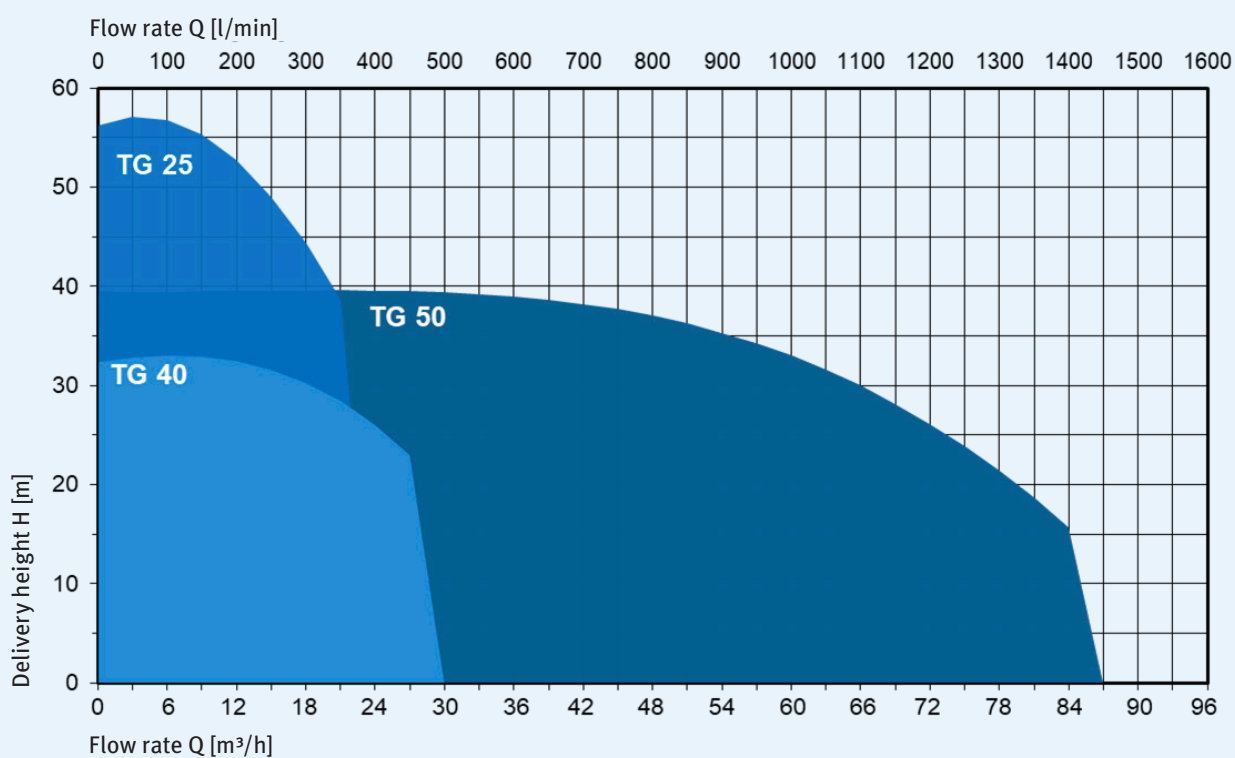
Maximum performance data

Type	Air proportion vol. [%]	Volume flow [l/min]	Delivery height [m]	Grain size [mm]	Chip length [mm]
TG 25	10	200	59	2	4
TG 30	10	350	28	1	3
TG 40	10	400	32	3	6
TG 50	10	1000	40	6	25

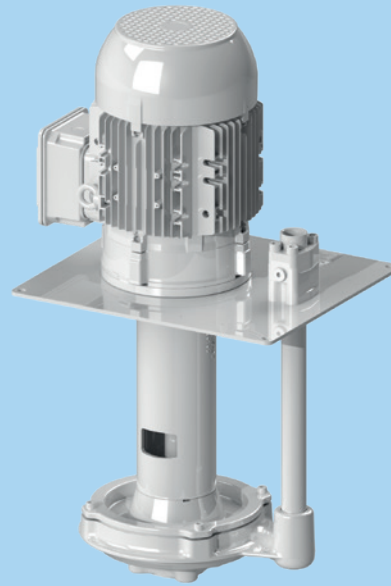
Fluid level

Type	Minimum gap [mm]	Min. fluid level [mm]	Fluid gap [mm]
TG 25	40	80	40
TG 30	60	60	40
TG 40	60	60	40
TG 50	65	105	100

Characteristic curve diagram



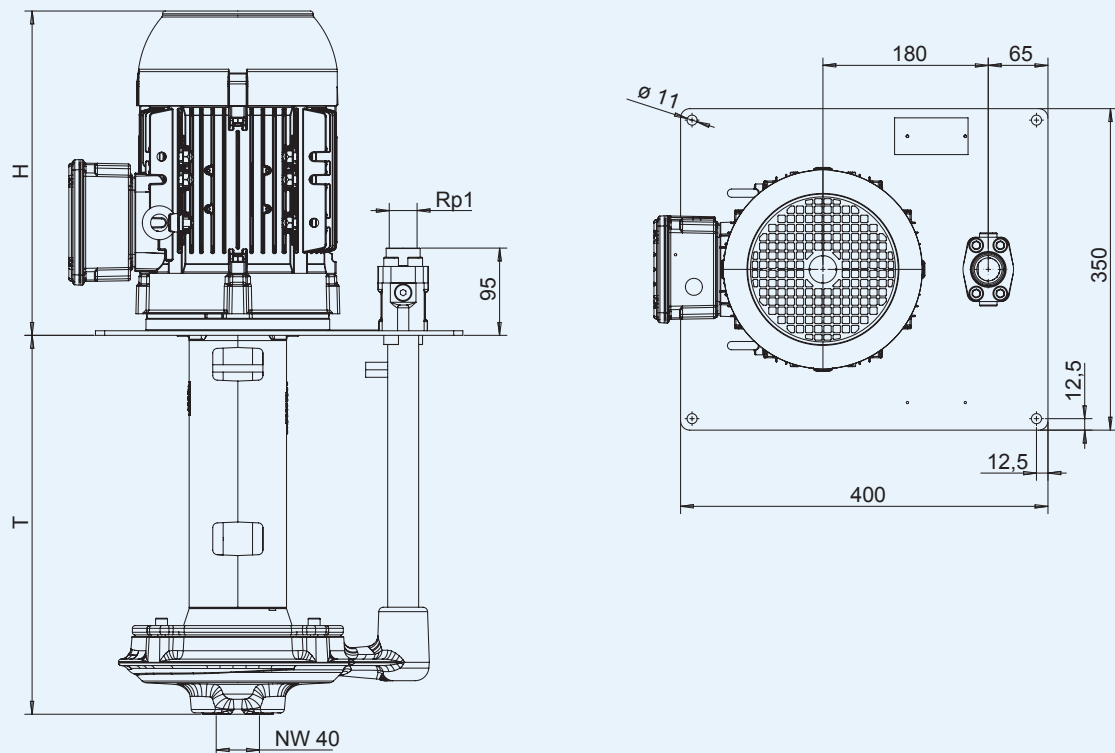
TG 25 clean medium pump



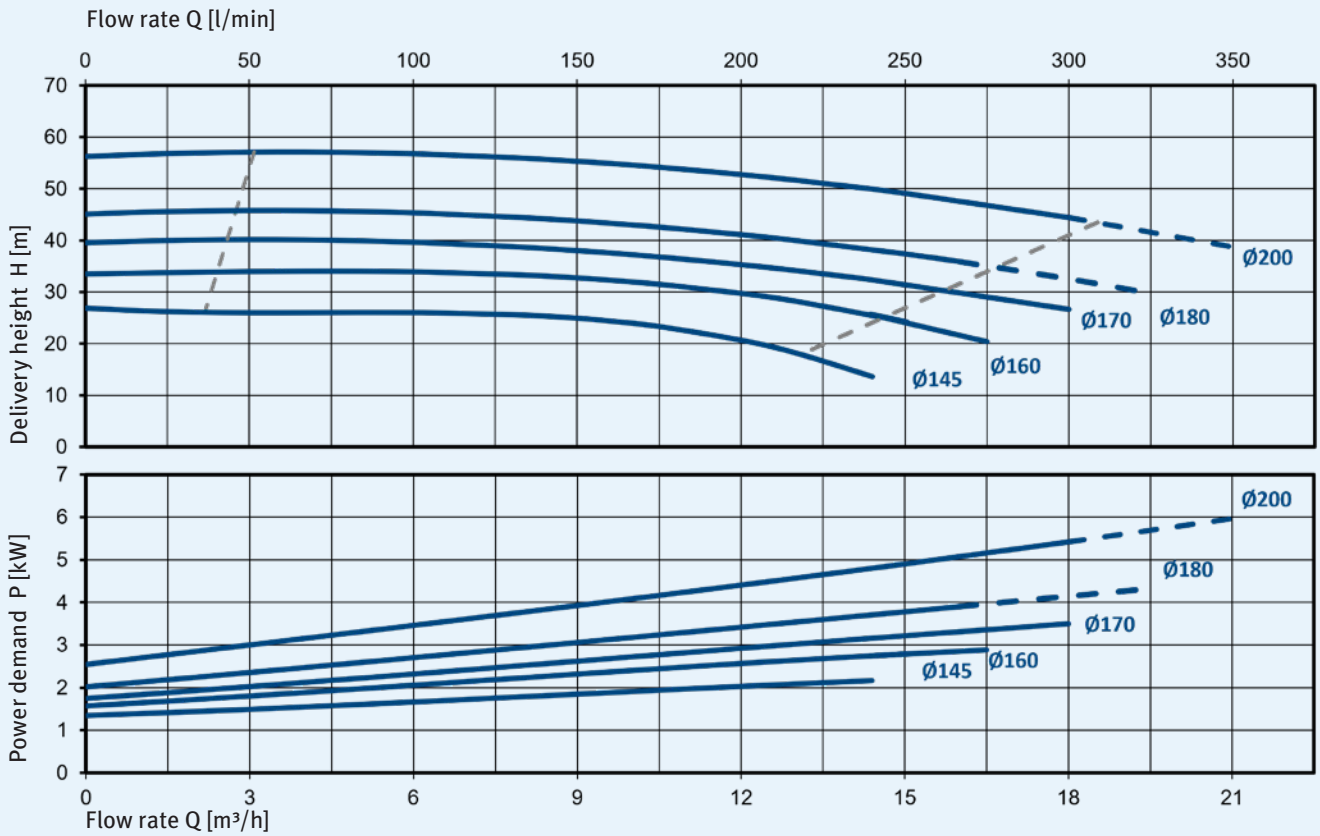
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level 50/60 Hz [dB(A)]
TG 25-../30 410	410	327	60	50/60	3.0	62/68
TG 25-../40 410	410	352.5	70	50/60	4.0	62/66
TG 25-../55 410	410	389	93	50/60	5.5	63
TG 25-../30 845	845	327	72	50/60	3.0	62/68
TG 25-../40 845	845	352.5	83	50/60	4.0	62/66
TG 25-../55 845	845	389	106	50/60	5.5	63

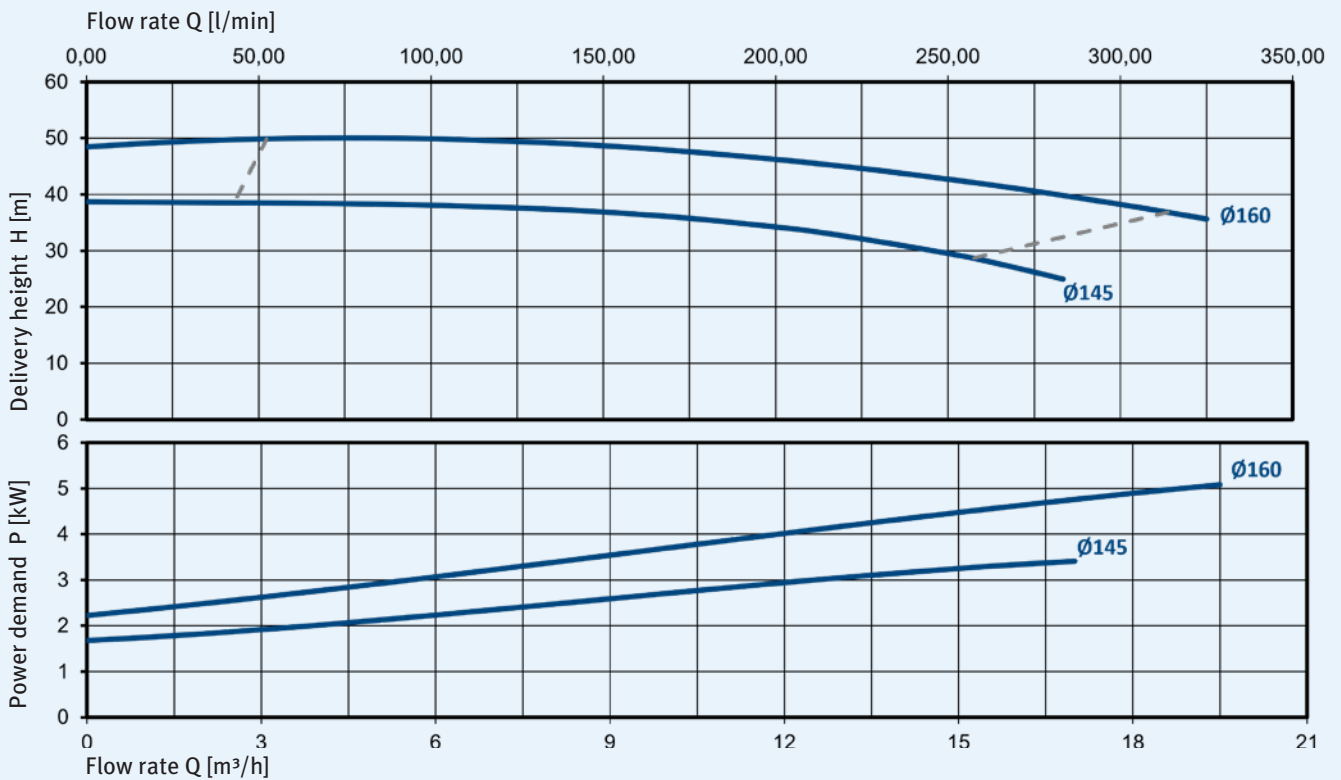
Dimensions



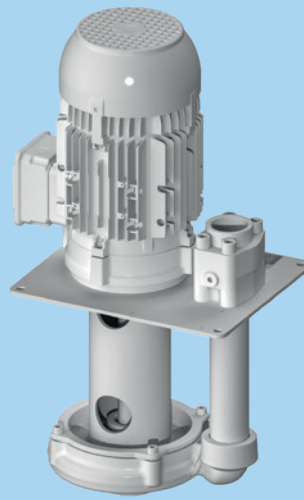
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



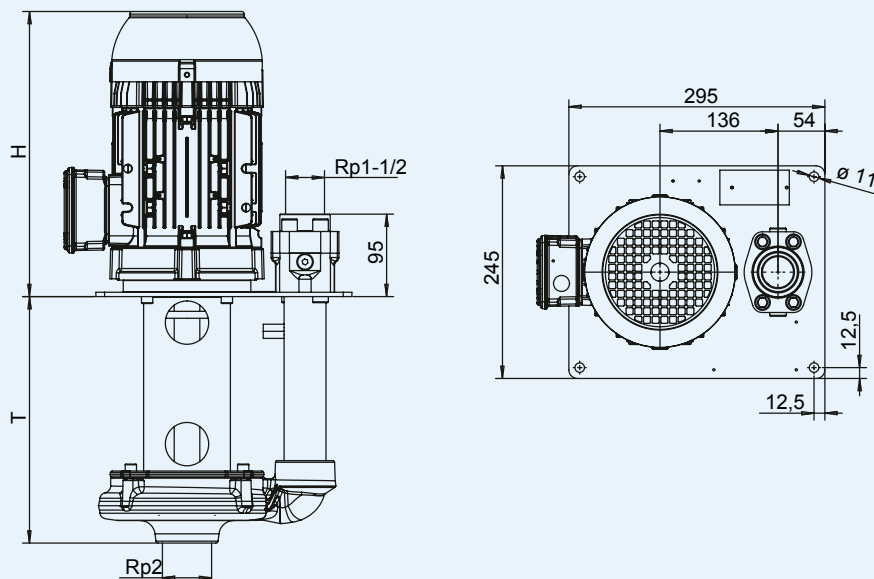
TG 40 clean medium pump



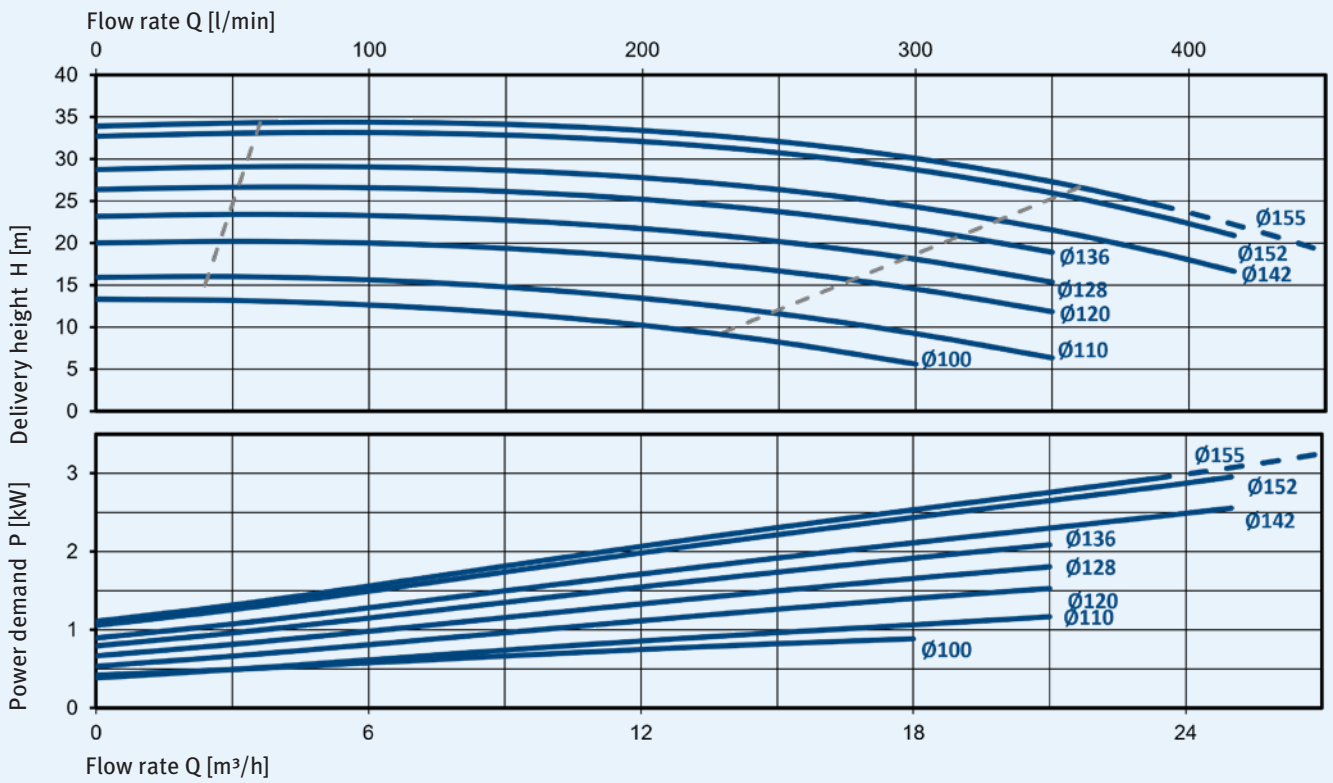
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level 50/60 Hz [dB(A)]
TG 40-../07 285	285	253	27.5	50	0.75	59/62
TG 40-../11 285	285	277	28	50	1.1	59/62
TG 40-../15 285	285	328.5	37.5	50/60	1.5	62/68
TG 40-../22 285	285	328.5	42.5	50/60	2.2	62
TG 40-../30 285	285	328.5	46	50/60	3.0	62/68
TG 40-../07 530	530	253	33	50	0.75	59/62
TG 40-../11 530	530	277	33.5	50	1.1	59/62
TG 40-../15 530	530	328.5	43	50/60	1.5	62/68
TG 40-../22 530	530	328.5	48	50/60	2.2	62
TG 40-../30 530	530	328.5	51.5	50/60	3.0	62/68
TG 40-../15 780	780	328.5	48.5	50/60	1.5	62/68
TG 40-../22 780	780	328.5	53.5	50/60	2.2	62
TG 40-../30 780	780	328.5	57	50/60	3.0	62/68

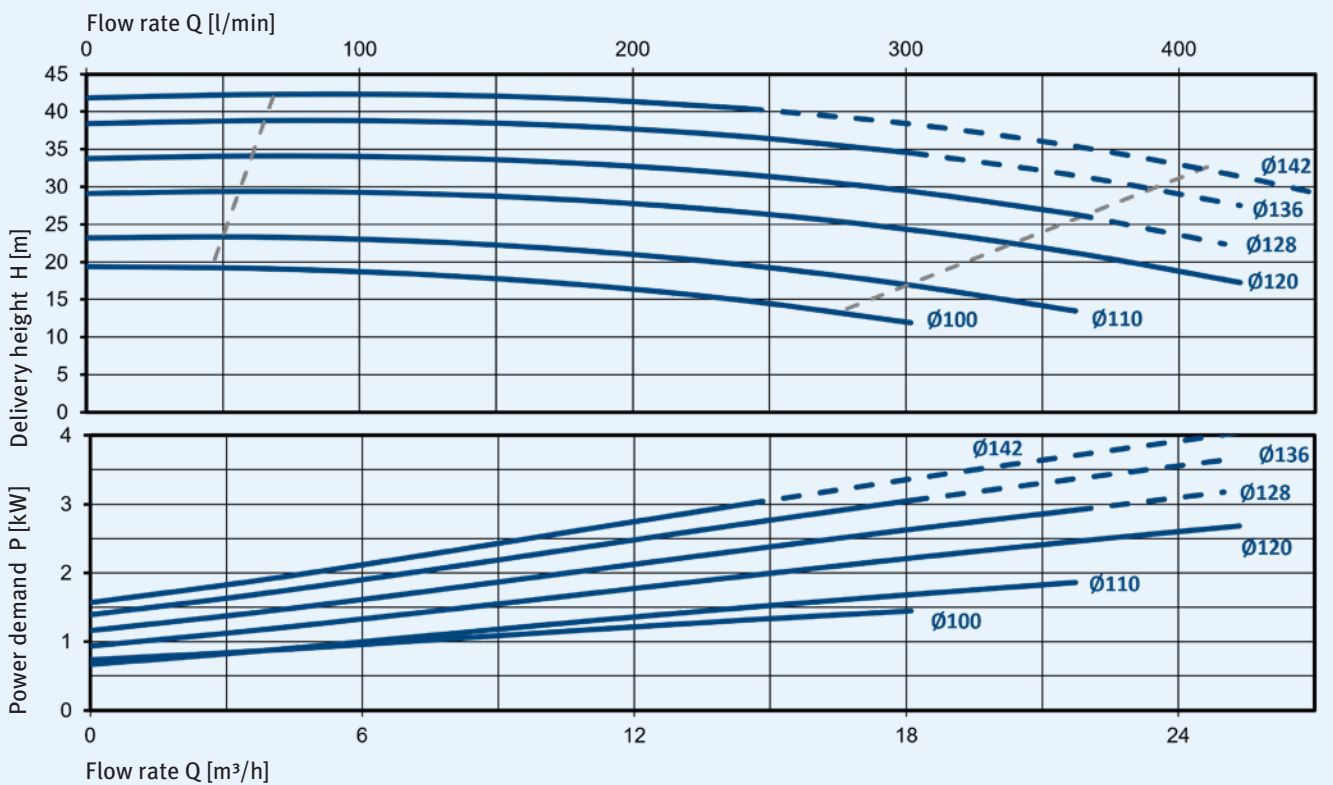
Dimensions



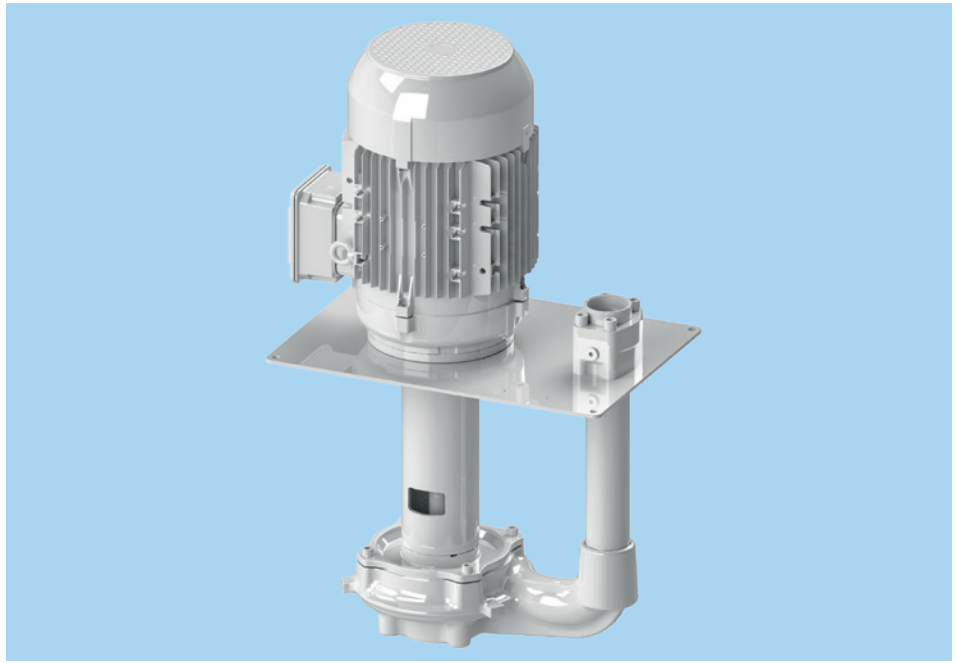
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



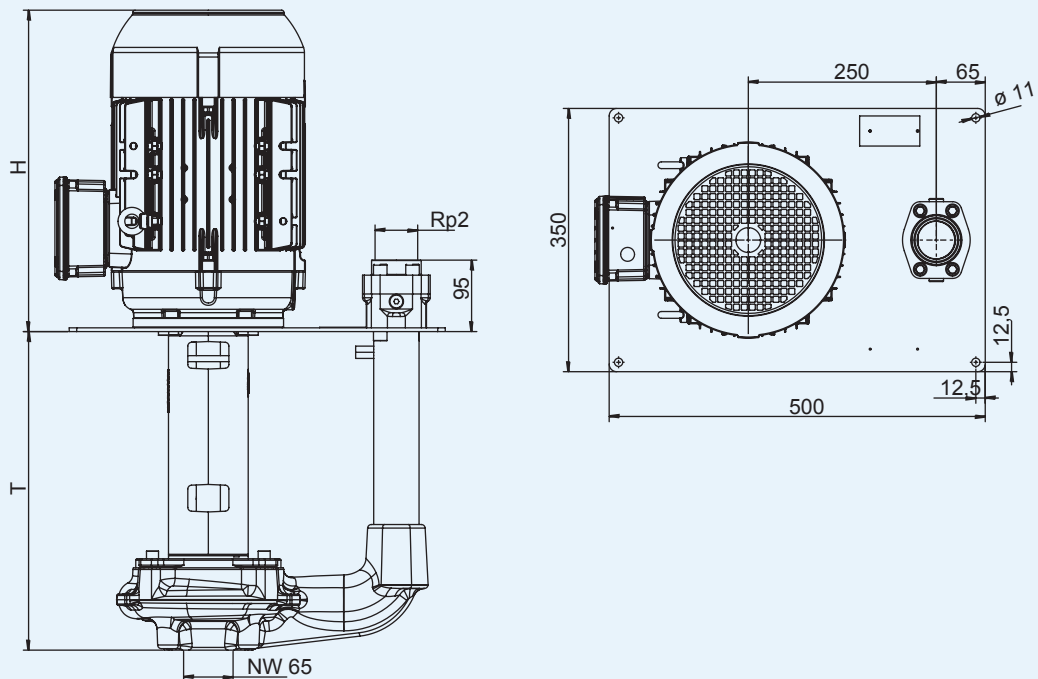
TG 50 clean medium pump



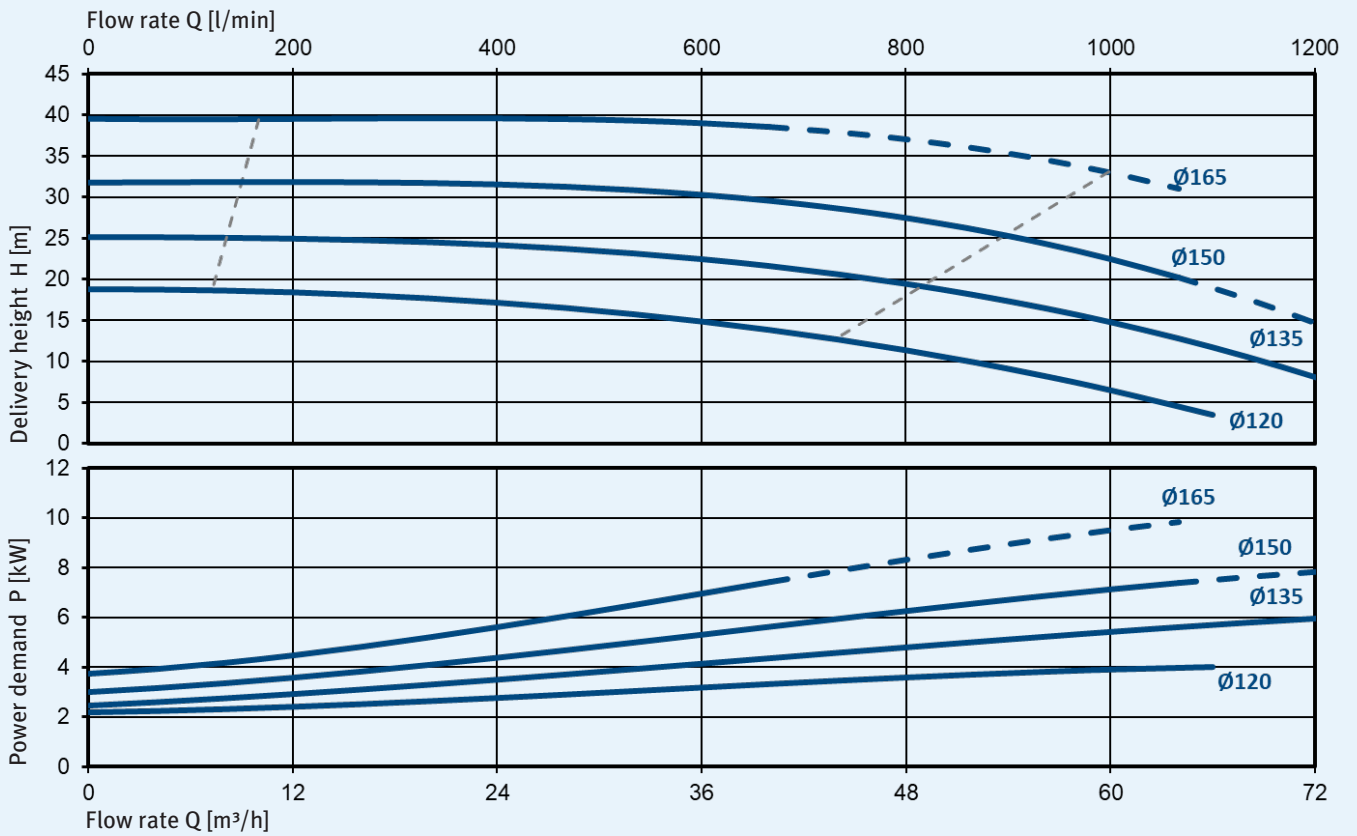
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level [dB(A)]
TG 50-../40 425	425	352.5	78	50/60	4.0	62/66
TG 50-../55 425	425	389	101	50/60	5.5	63
TG 50-../75 425	425	428	101	50/60	7.5	63
TG 50-../40 860	860	352.5	92	50/60	4.0	62/66
TG 50-../55 860	860	389	115	50/60	5.5	63
TG 50-../75 860	860	428	115	50/60	7.5	63

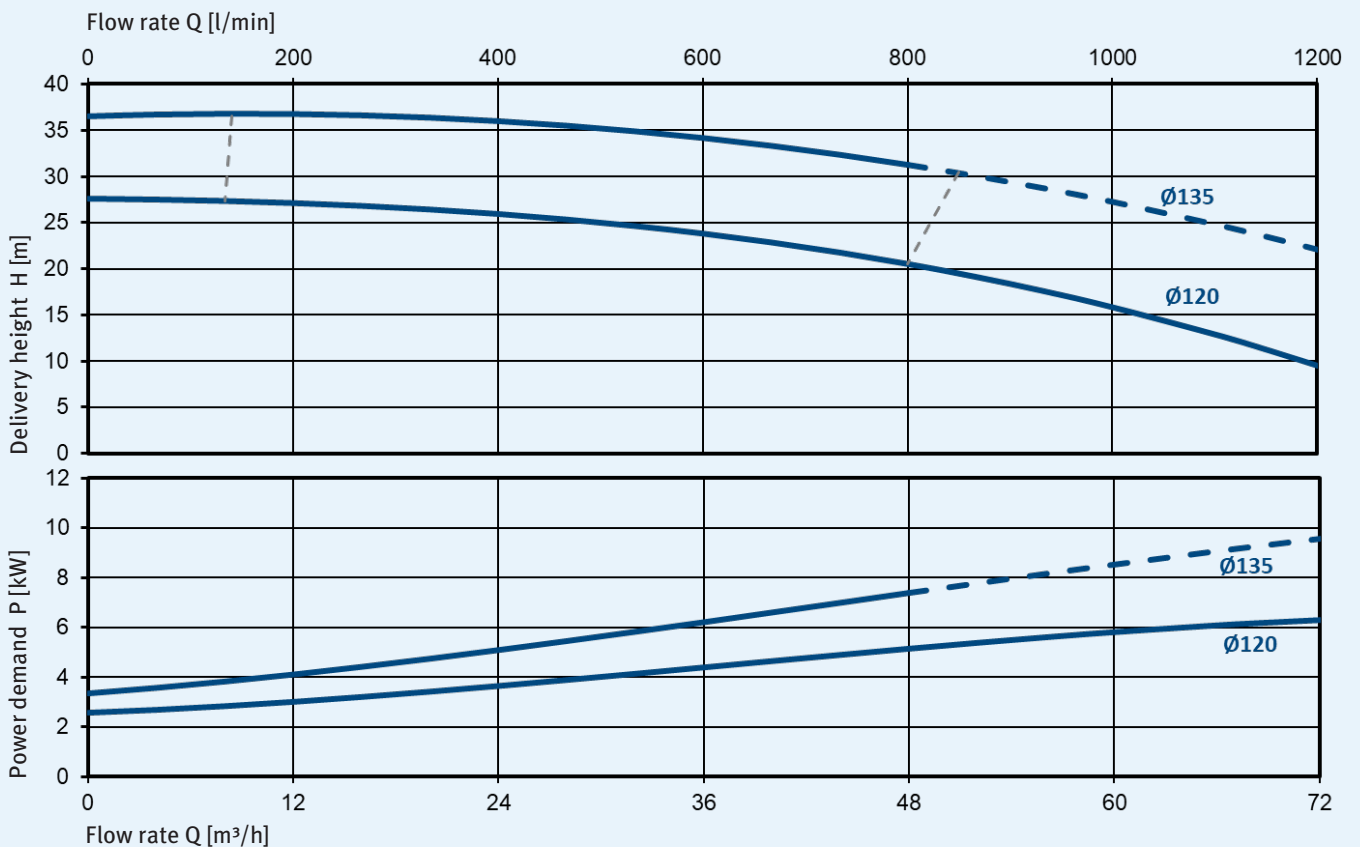
Dimensions



Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s

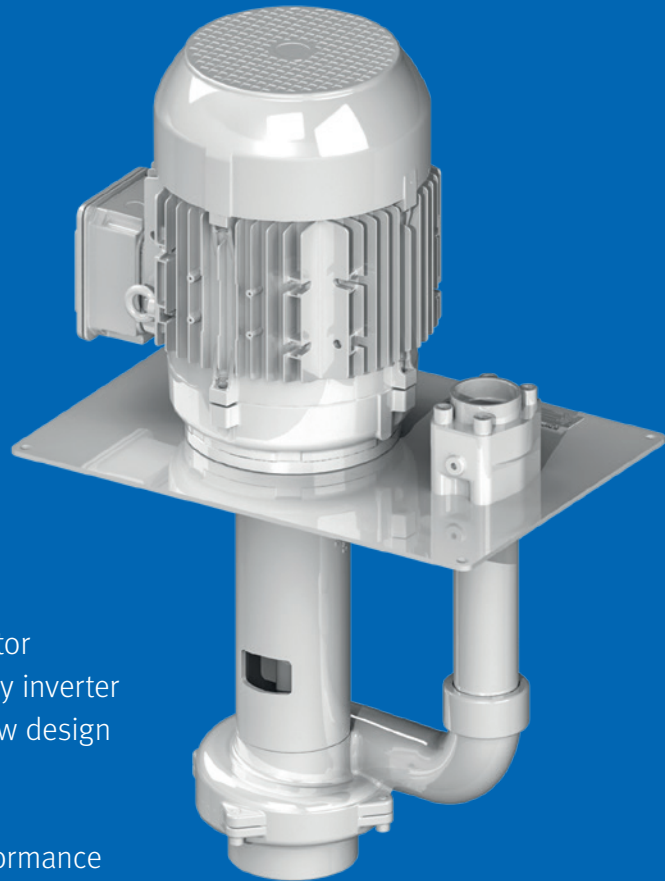


Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



Contaminated medium pumps

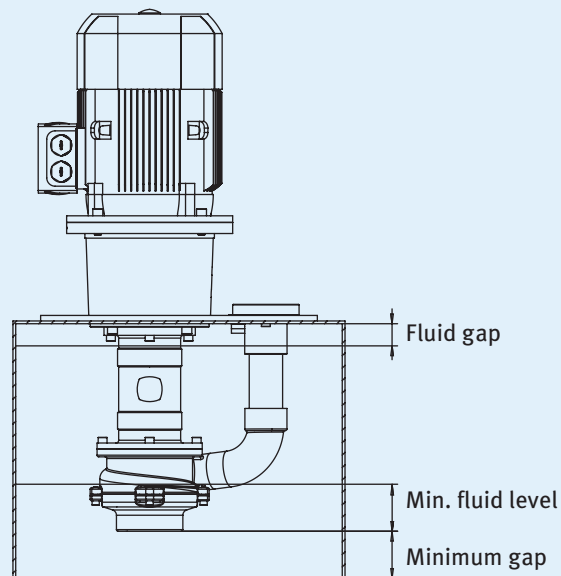
KNOLL TF, TS, TSK and TSL contaminated medium pumps are cooling lubricant pumps that convey heavily contaminated media. These pumps are able to transport the mixture of chips and cooling lubricant to the filter or separator.



Properties

- No gaskets
- Flexible design with standard-dimensioned motor
- Energy efficient in combination with a frequency inverter
- Extremely high efficiency thanks to impeller flow design
- POM/GJL-250/ST impeller material
- Wear-resistant component design
- With pre-fitted inducer to improve suction performance with media containing a high proportion of air

Dimensions



Maximum performance data

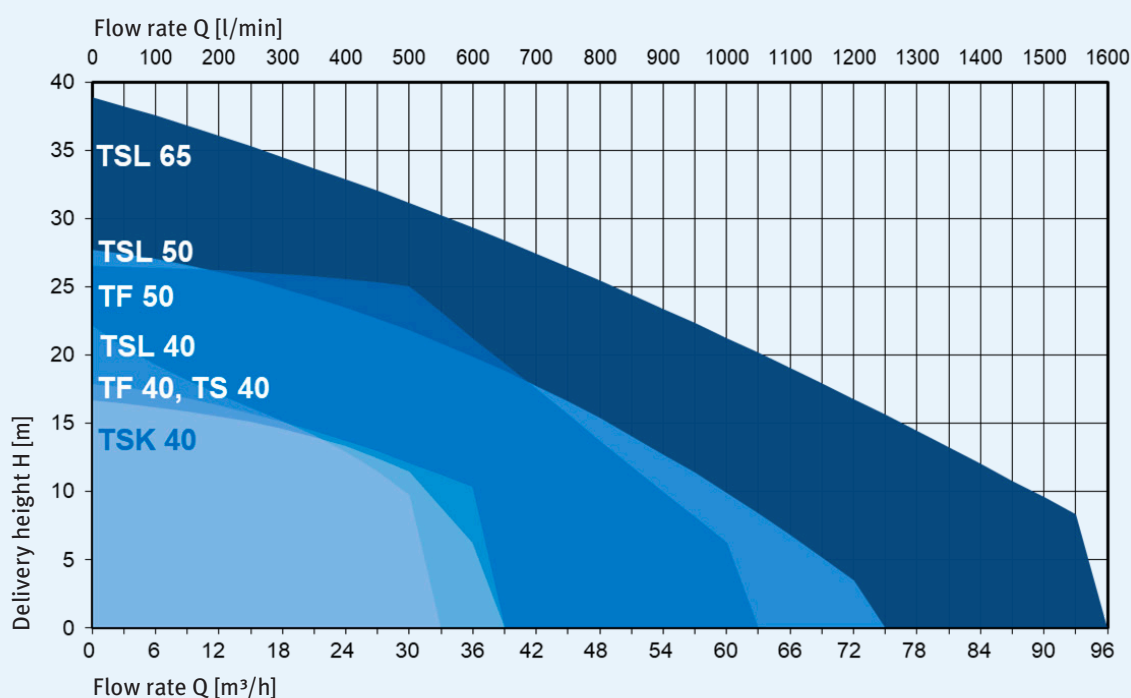
Type	Air proportion vol. [%]	Volume flow [l/min]	Delivery height [m]	Grain size [mm]	Chip length [mm]	Chip transport* [g/l]
TF 40	10	650	18	15	40	5
TF 50	10	1200	26	30	70	7
TS 40	10	550	18	12	20	2
TSK 40	10	600	17	20	40	5
TSL 40	10	500	22	15	40	3
TSL 50	10	1200	28	20	40	5
TSL 65	10	1500	38	20	40	7

*Values valid for steel. For aluminum, the value is reduced by a factor of 0.34.

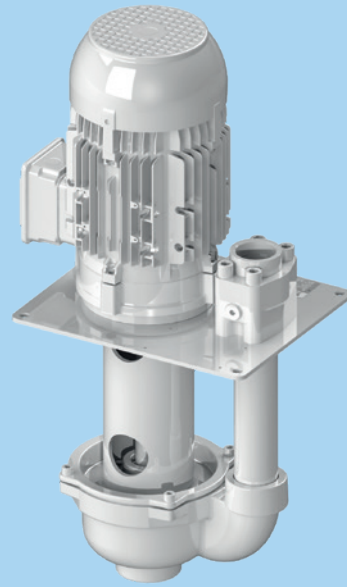
Fluid level

Type	Minimum gap [mm]	Min. fluid level [mm]	Fluid gap [mm]
TF 40	60	110	40
TF 50	75	150	40
TS 40	60	110	40
TSK 40	70	80	40
TSL 40	40	56	40
TSL 50	75	95	40
TSL 65	75	80	40

Characteristic curve diagram



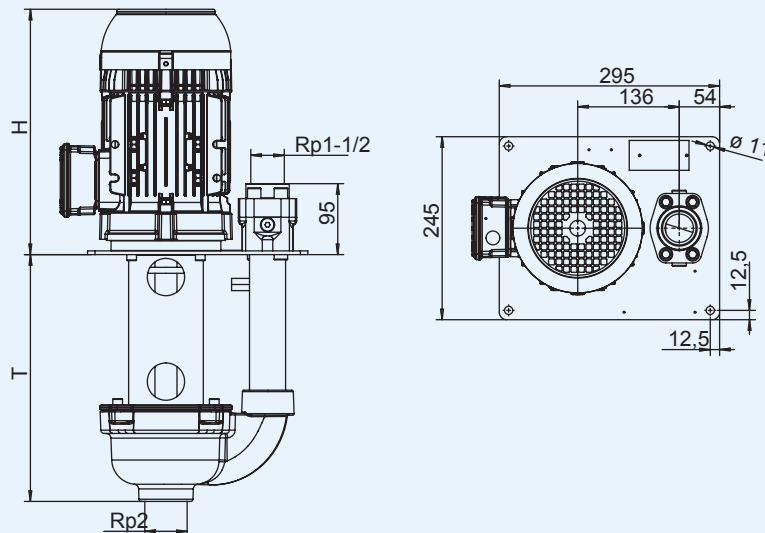
TF 40 contaminated medium pump



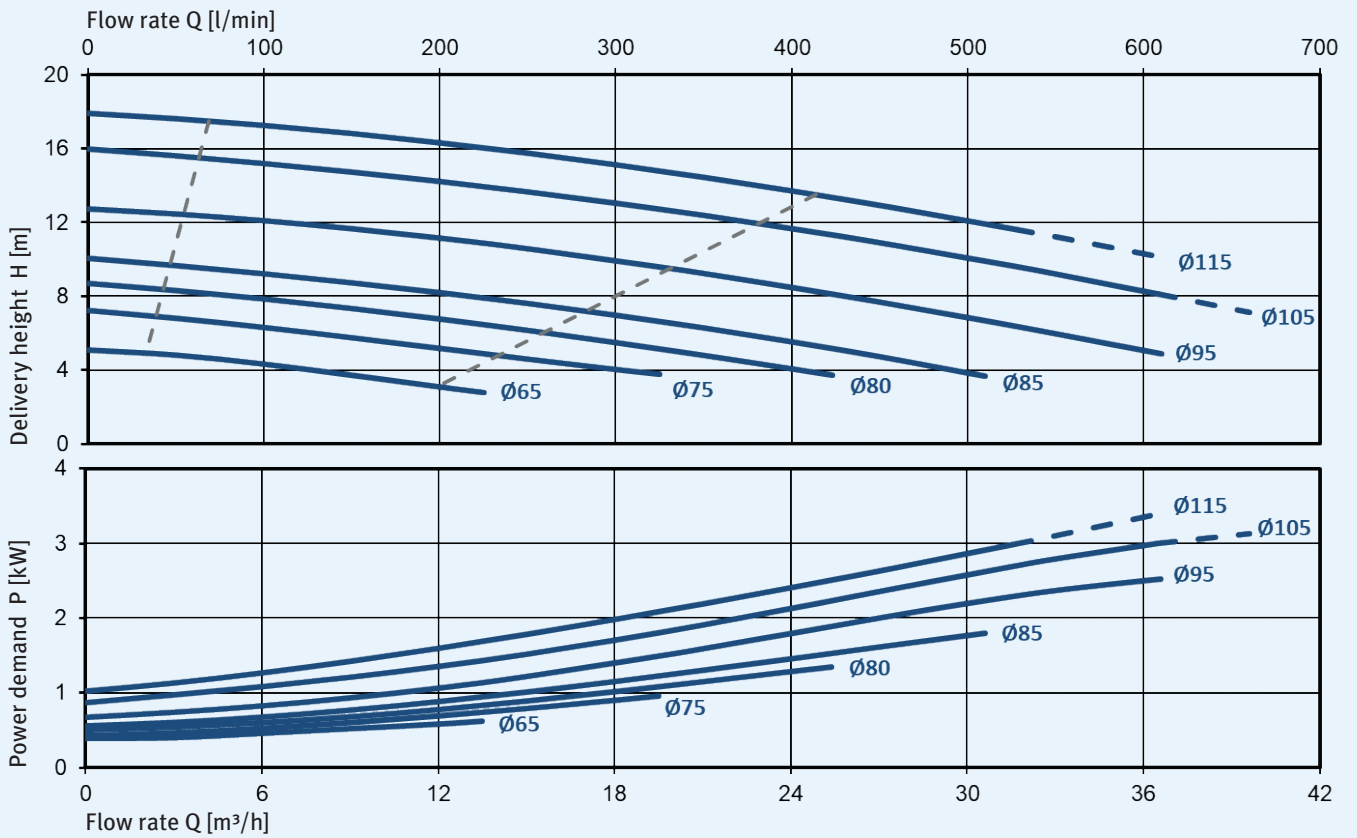
Variations

Type	D [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level 50/60 Hz [dB(A)]
TF 40-.. / 07 330	330	253	26	50	0.75	59/62
TF 40-.. / 11 330	330	277	27	50/60	1.10	59/62
TF 40-.. / 15 330	330	328.5	30	50/60	1.50	62/68
TF 40-.. / 22 330	330	328.5	33	50/60	2.20	62
TF 40-.. / 30 330	330	328.5	37	50/60	3.00	62/68
TF 40-.. / 07 578	578	253	33	50	0.75	59/62
TF 40-.. / 11 578	578	277	34	50/60	1.10	59/62
TF 40-.. / 15 578	578	328.5	37	50/60	1.50	62/68
TF 40-.. / 22 578	578	328.5	40	50/60	2.20	62
TF 40-.. / 30 578	578	328.5	44	50/60	3.00	62/68
TF 40-.. / 15 826	826	328.5	44	50/60	1.50	62/68
TF 40-.. / 22 826	826	328.5	47	50/60	2.20	62
TF 40-.. / 30 826	826	328.5	51	50/60	3.00	62/68

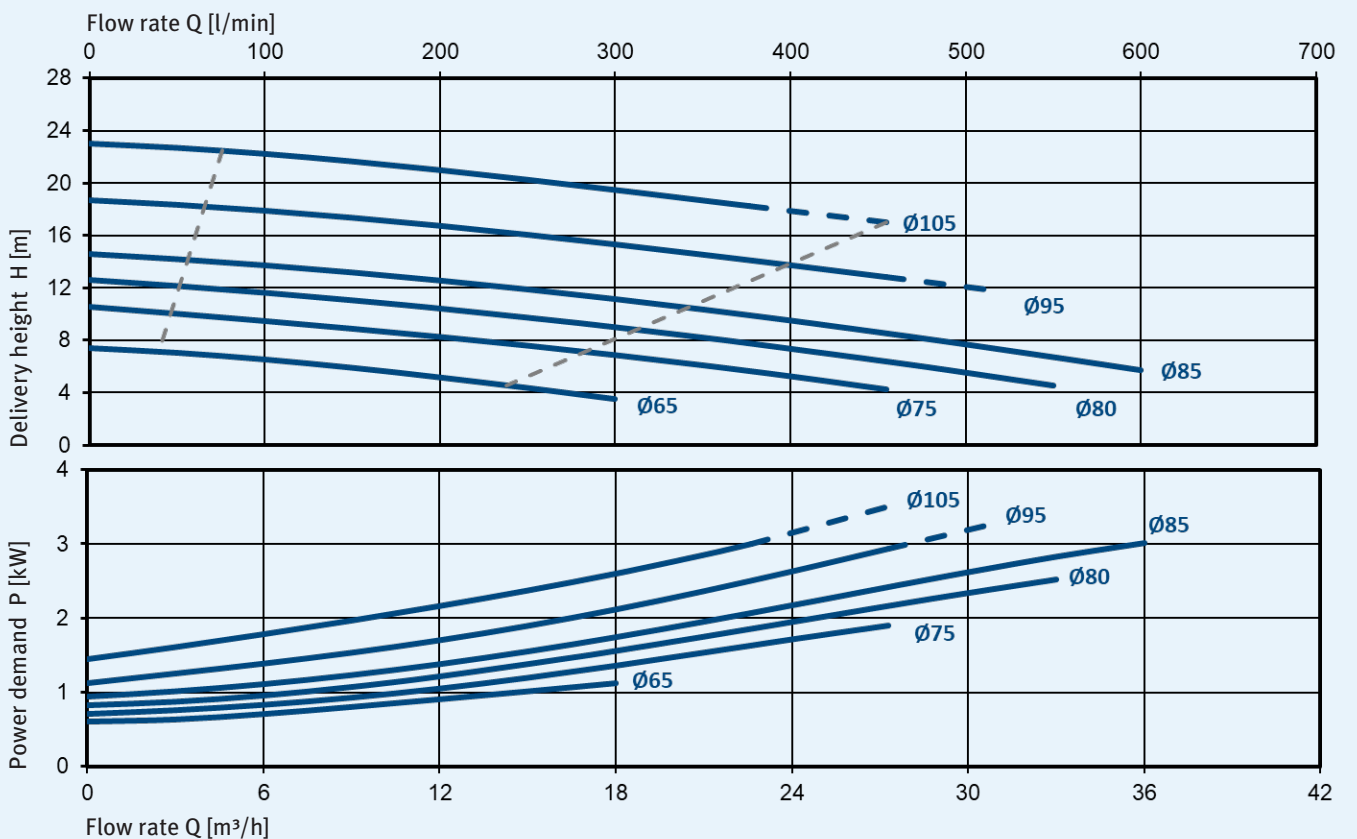
Dimensions



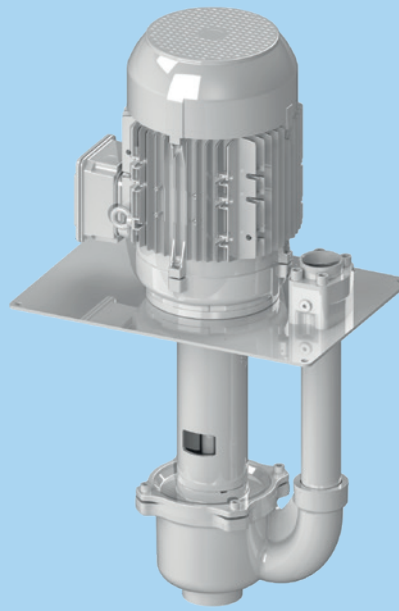
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



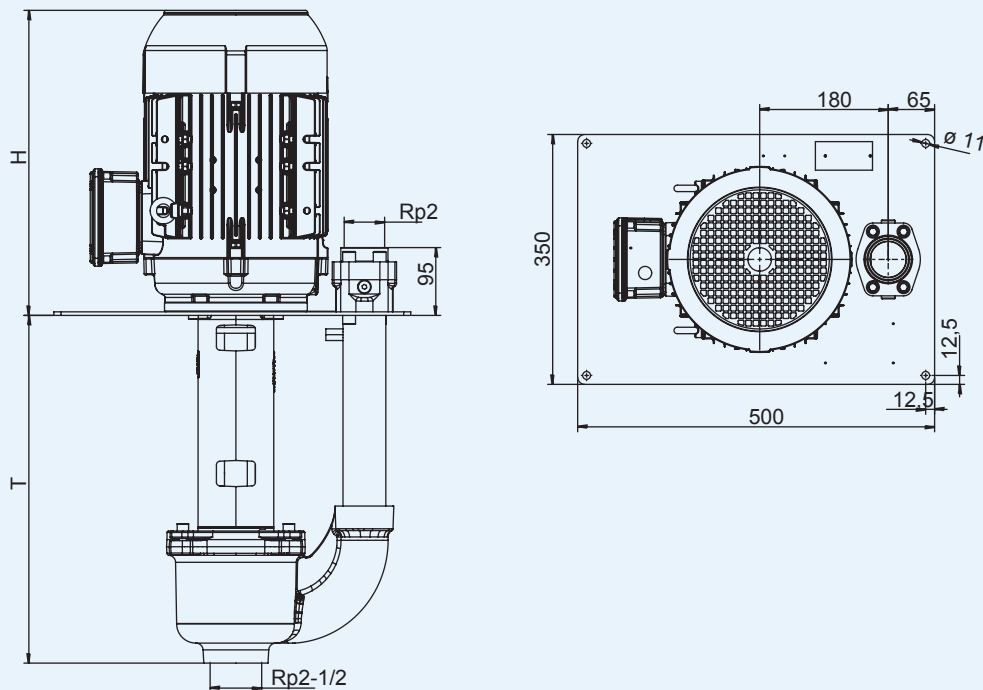
TF 50 contaminated medium pump



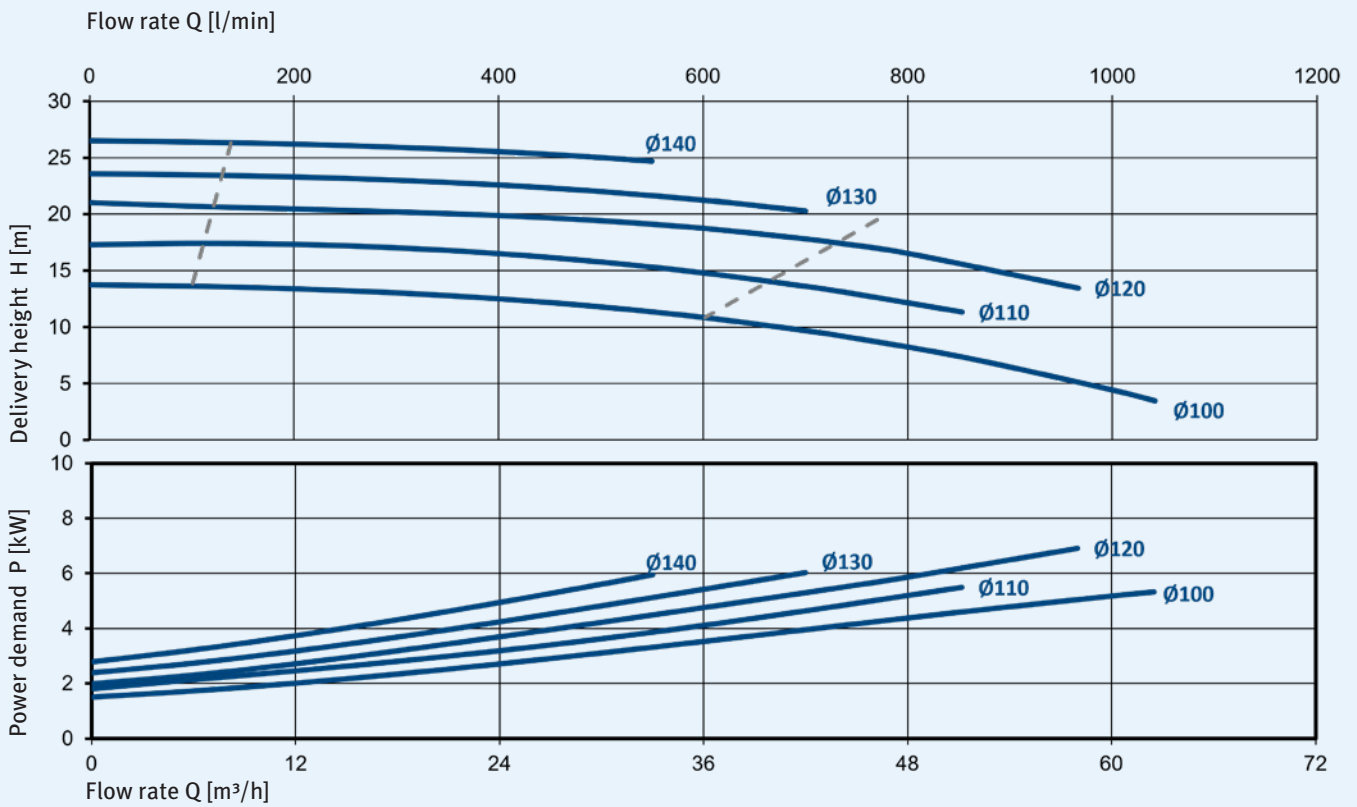
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level 50/60 Hz [dB(A)]
TF 50-../40 485	485	352.5	73.5	50/60	4.0	62/66
TF 50-../55 485	485	389	96.5	50/60	5.5	63
TF 50-../75 485	485	428	96.5	50/60	7.5	63
TF 50-../40 920	920	352.5	88.5	50/60	4.0	62/66
TF 50-../55 920	920	389	111.5	50/60	5.5	63
TF 50-../75 920	920	428	111.5	50/60	7.5	63

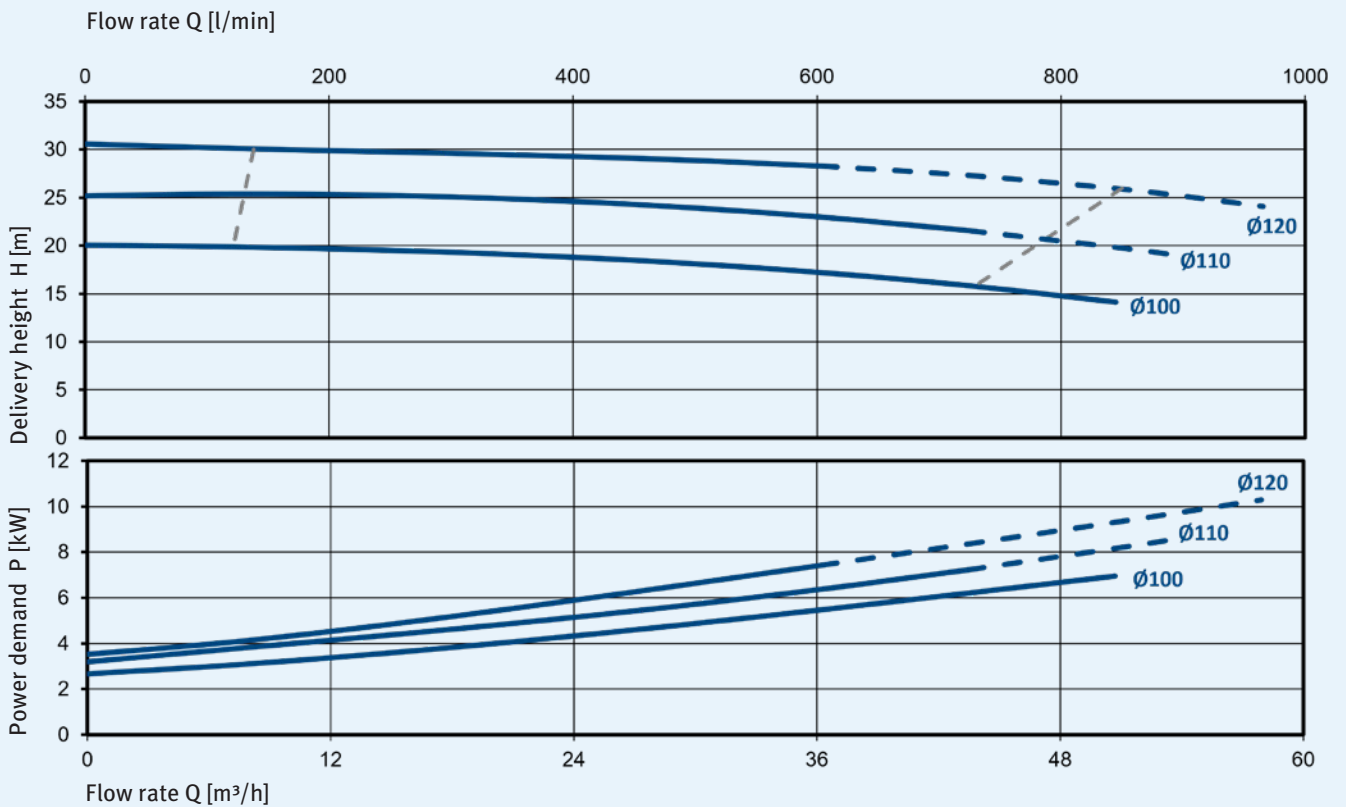
Dimensions



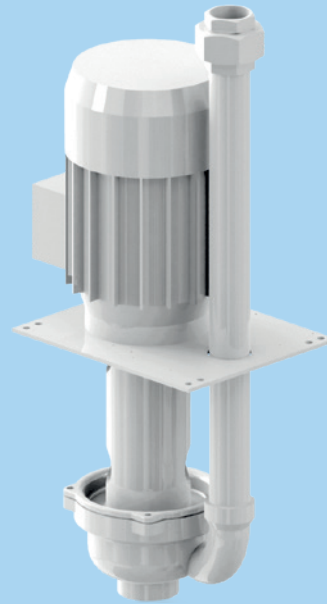
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



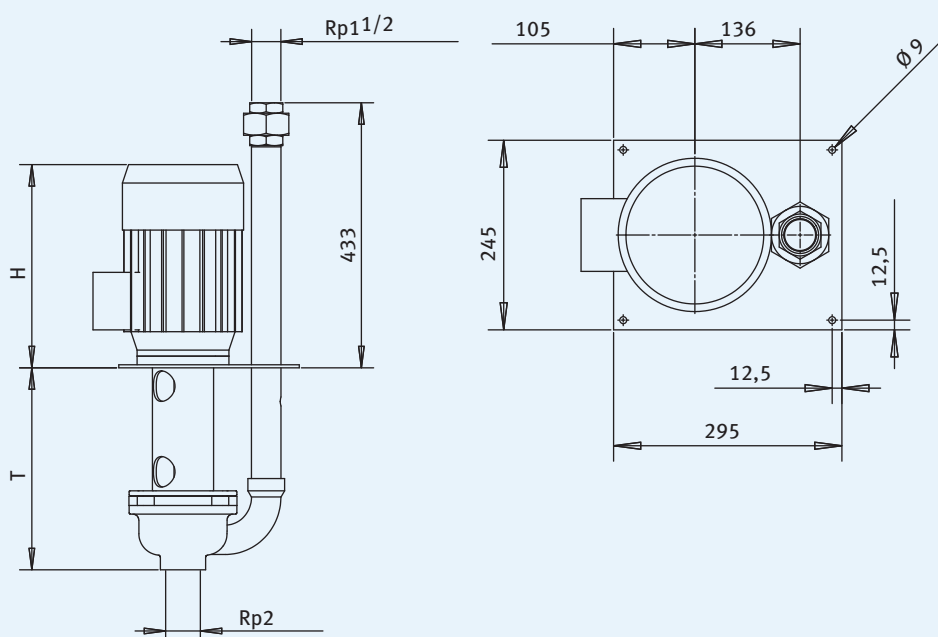
TS 40 contaminated medium pump



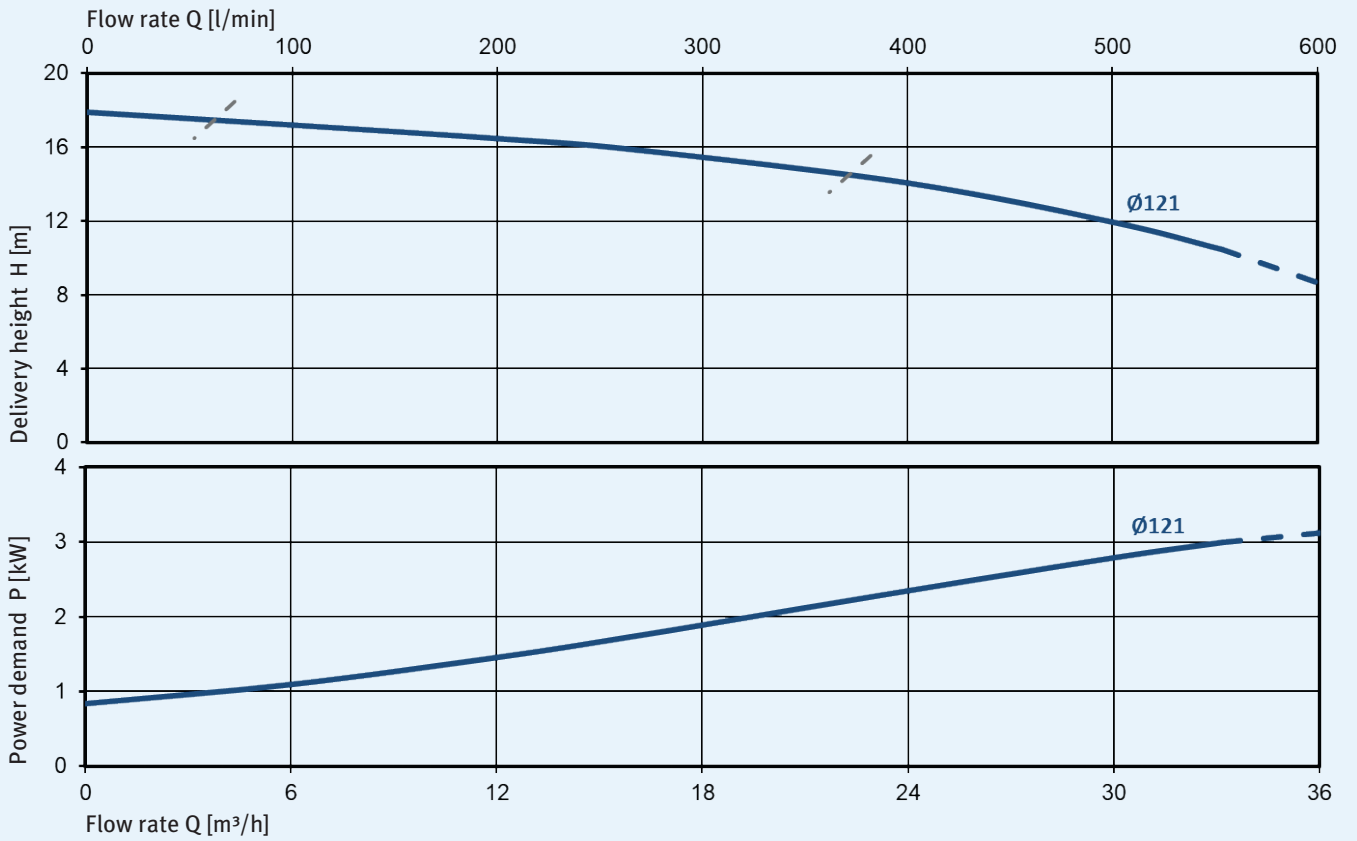
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level [dB(A)]
TS 40-21/22 338	338	285	33	50/60	2.2	62/65
TS 40-21/30 338	338	325	37	50/60	3.0	66/69
TS 40-21/22 586	586	285	40	50/60	2.2	62/65
TS 40-21/30 586	586	325	44	50/60	3.0	66/69
TS 40-21/22 834	834	285	47	50/60	2.2	62/65
TS 40-21/30 834	834	325	51	50/60	3.0	66/69

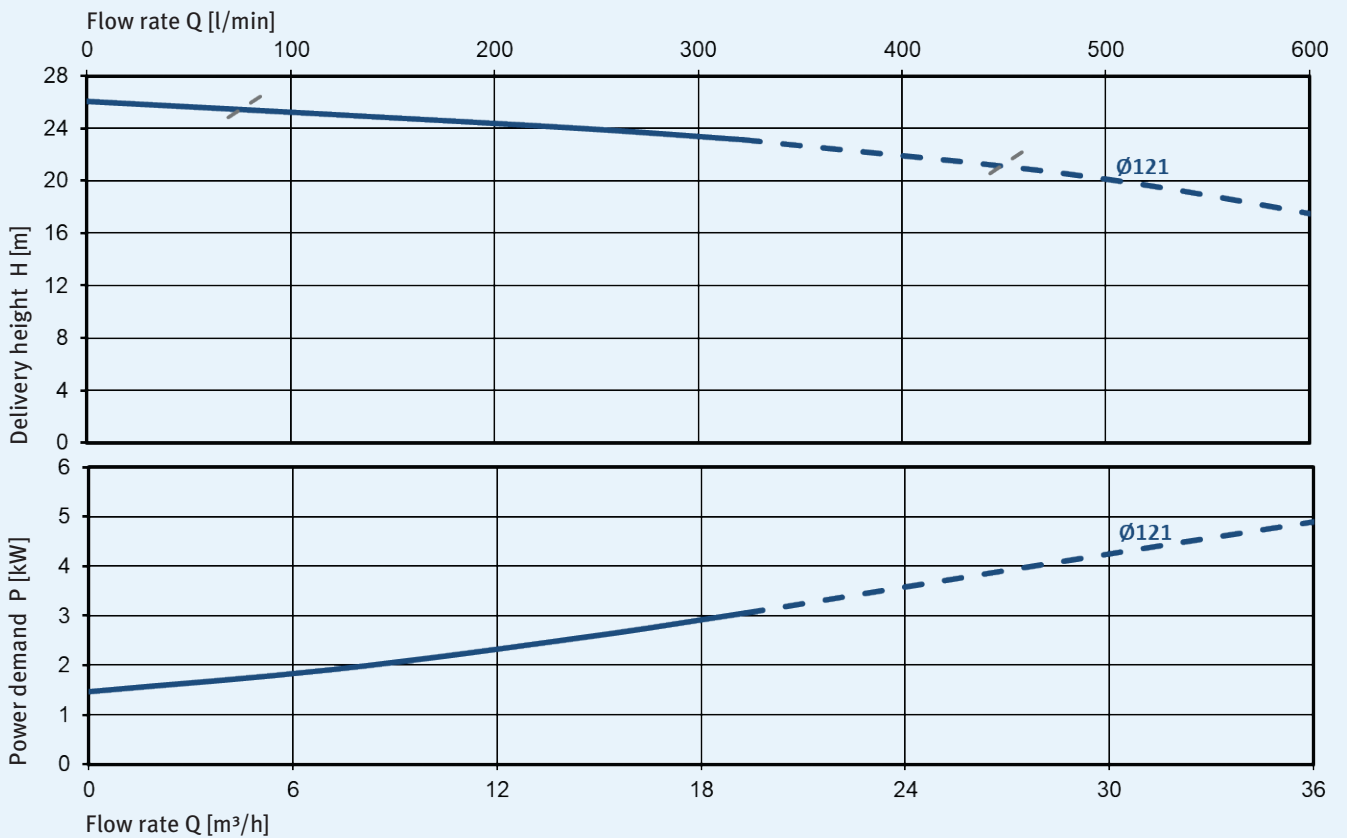
Dimensions



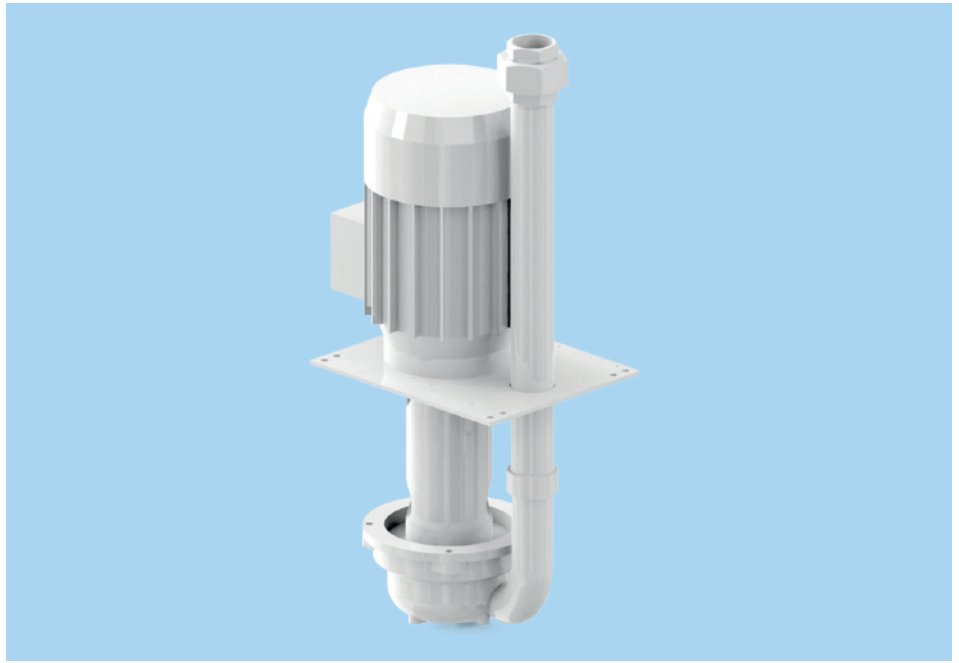
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



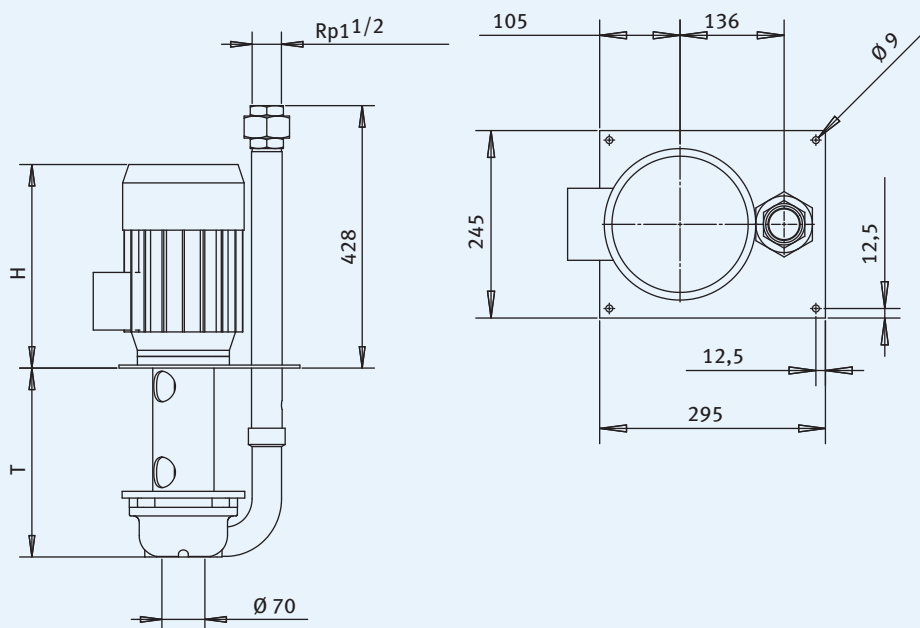
TSK 40 contaminated medium pump



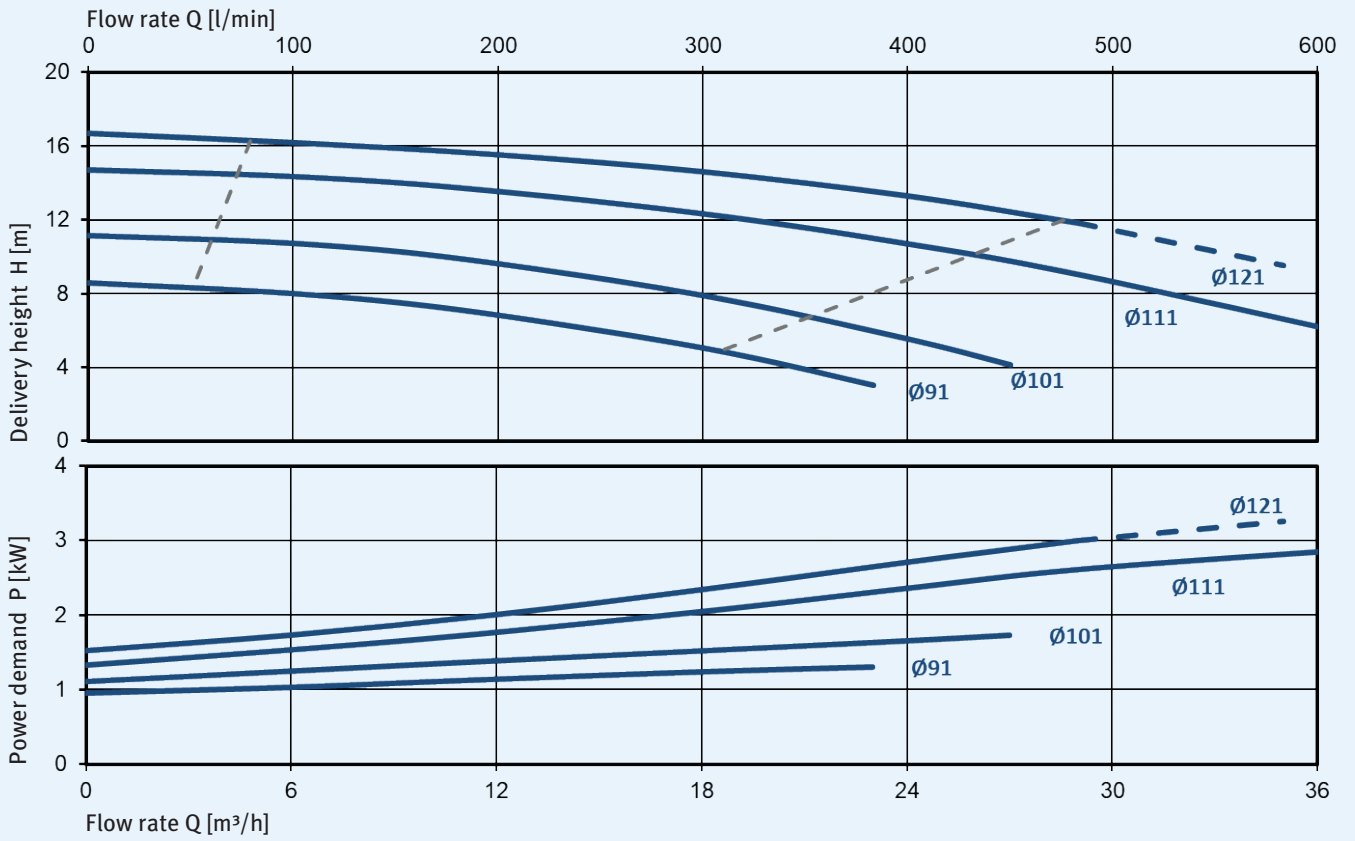
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level [dB(A)]
TSK 40-../22 310	310	285	33	50/60	2.2	62/65
TSK 40-../30 310	310	325	37	50/60	3.0	66/69
TSK 40-../22 558	558	285	40	50/60	2.2	62/65
TSK 40-../30 558	558	325	44	50/60	3.0	66/69
TSK 40-../22 806	806	285	47	50/60	2.2	62/65
TSK 40-../30 806	806	325	51	50/60	3.0	66/69

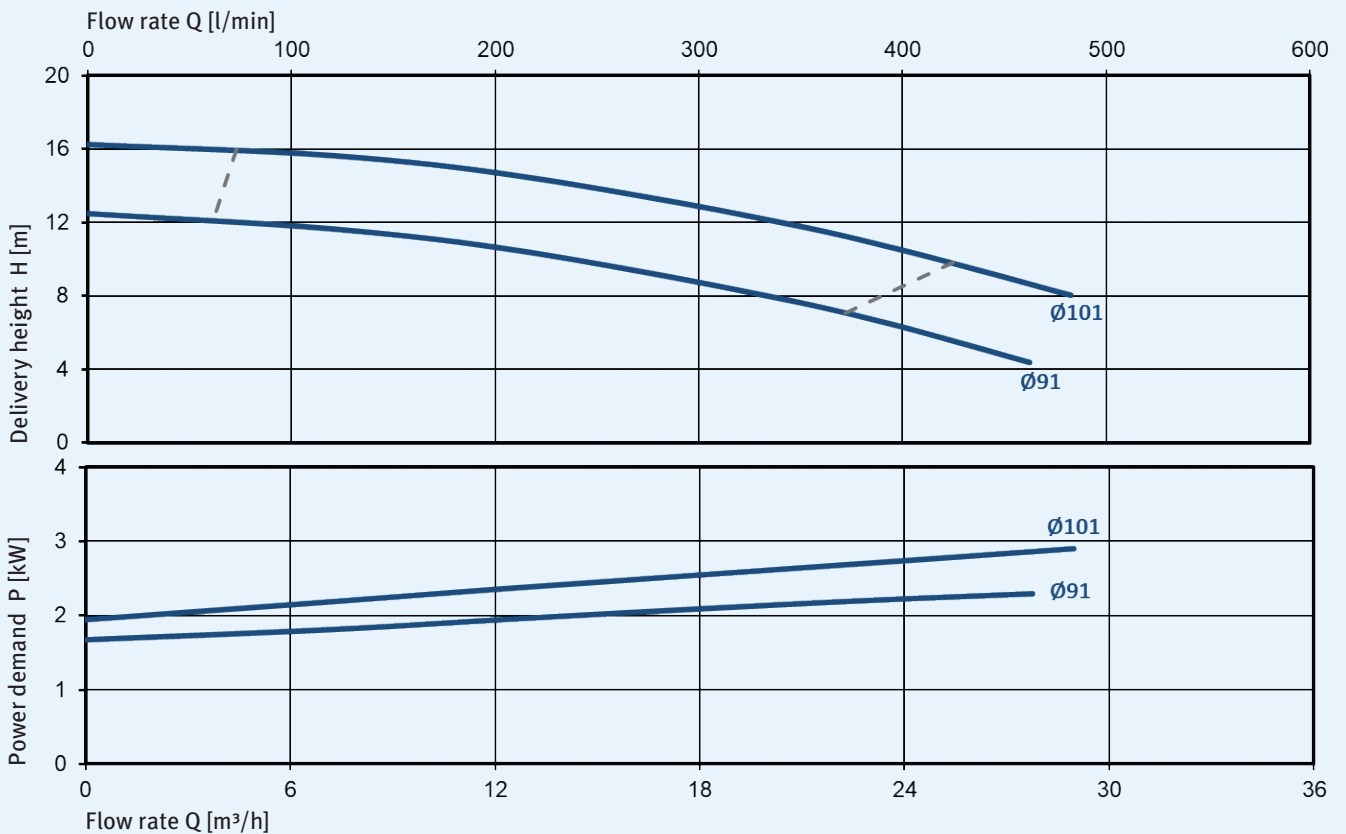
Dimensions



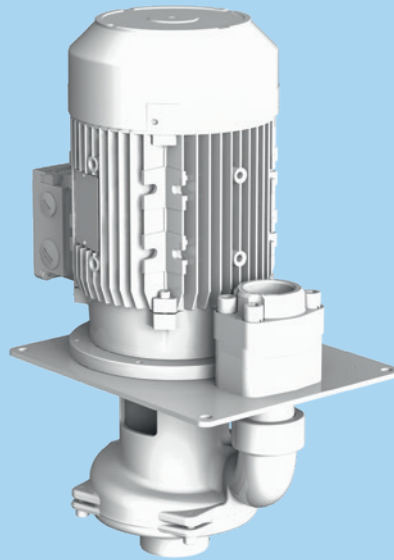
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



TSL 40 contaminated medium pump

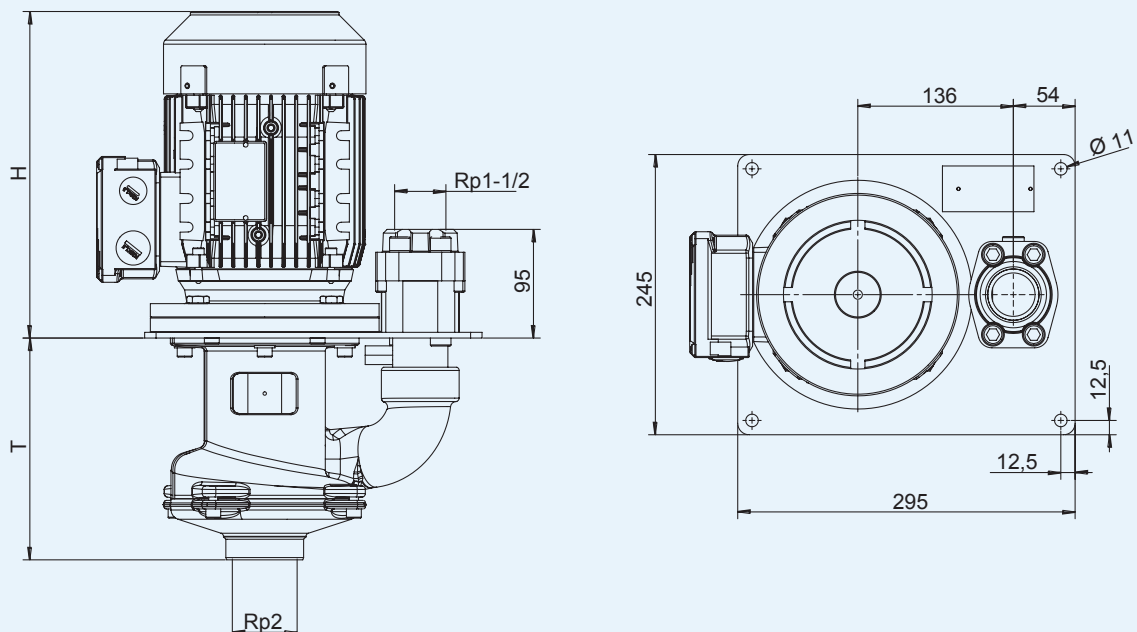


Variations

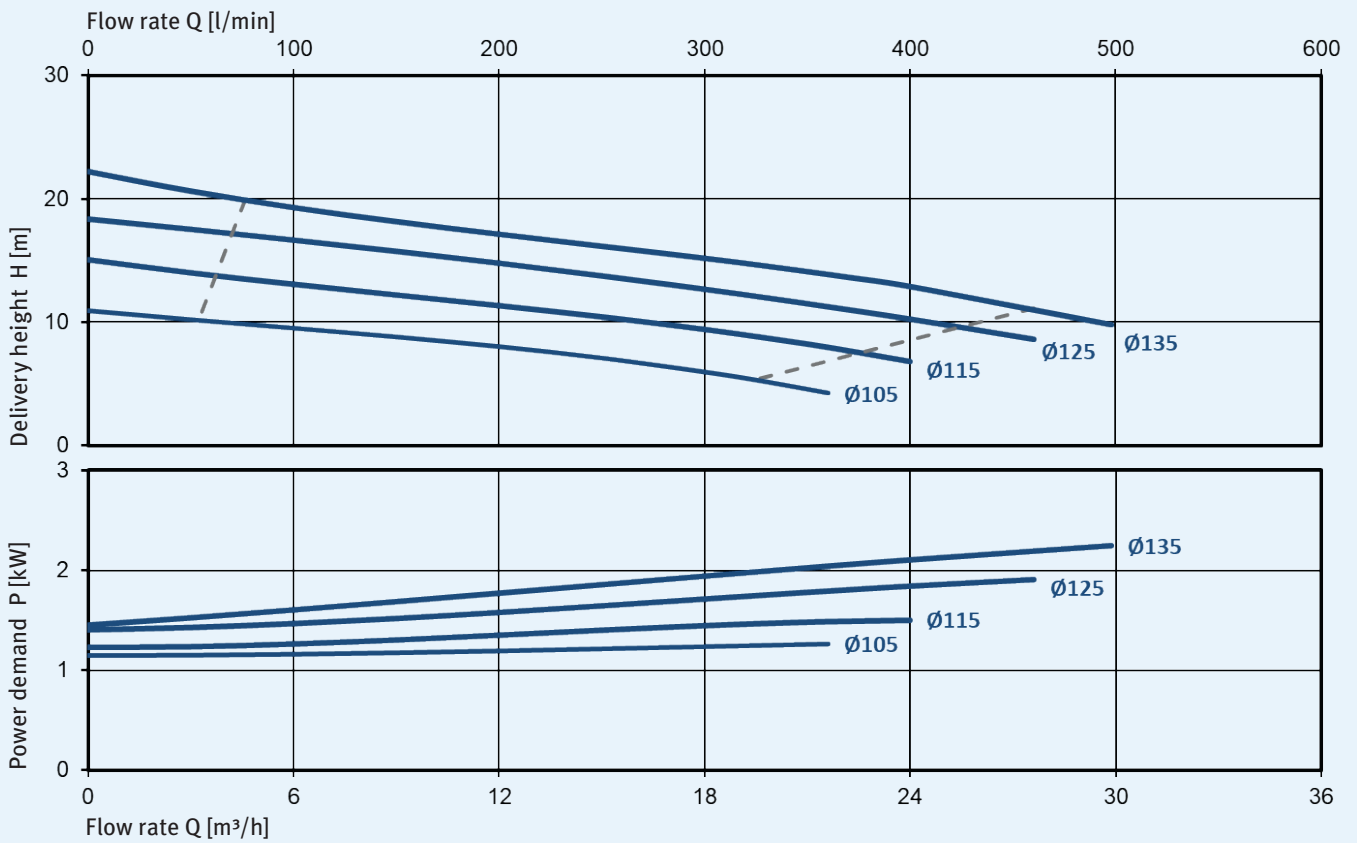
Type	T* [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level [dB(A)]
TSL 40-05/15 195	195	286	37	50	1.5	63
TSL 40-15/15 195	195	286	37	50	1.5	63
TSL 40-25/22 195	195	286	34	50	2.2	63
TSL 40-35/22 195	195	286	34	50	2.2	63
TSL 40-05/22 195	195	286	34	50/60	2.2	63/65
TSL 40-15/30 195	195	343	39	50/60	3.0	66/69
TSL 40-25/30 195	195	343	39	50/60	3.0	66/69

*The following depths of immersion can be provided on request: 290 mm, 510 mm and 840 mm.

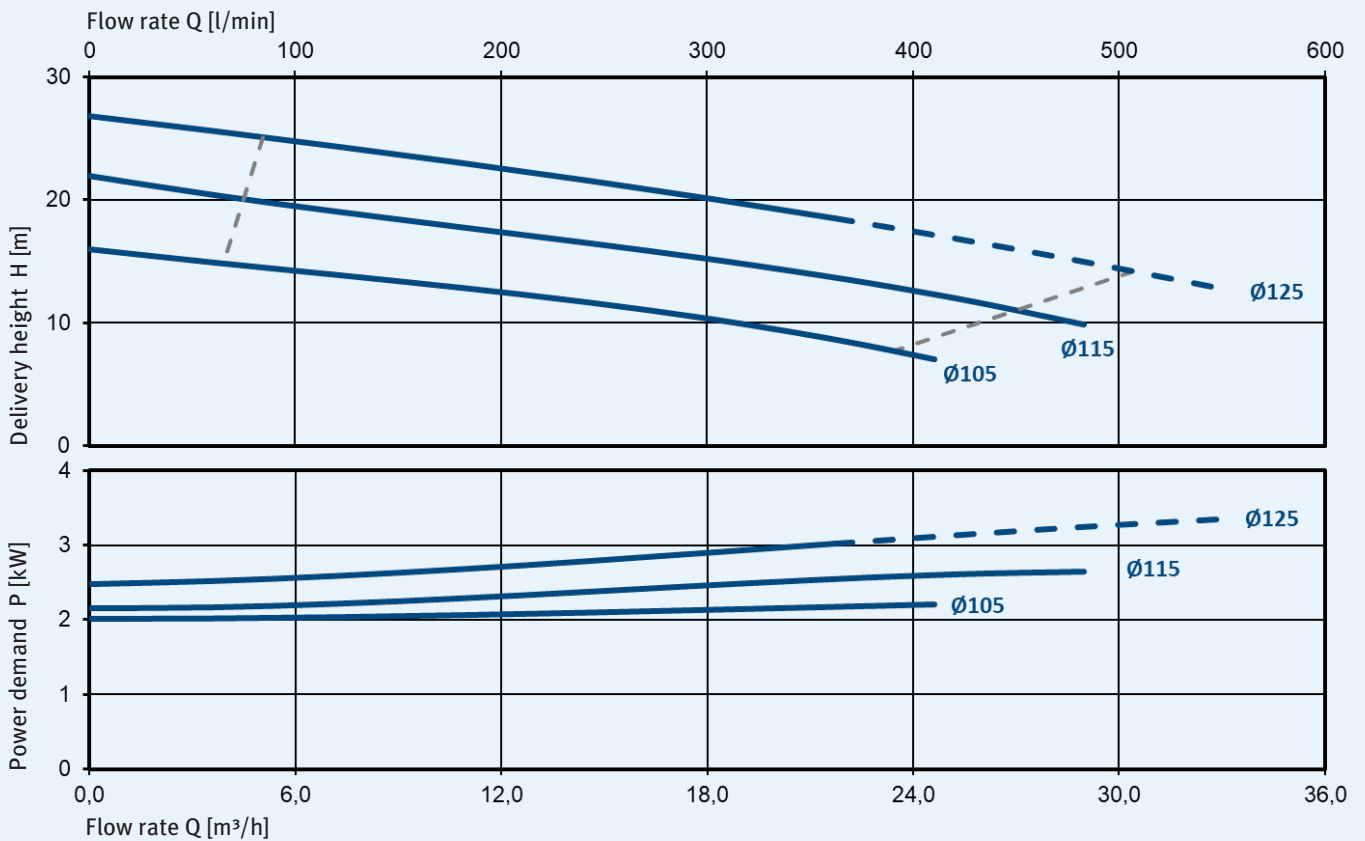
Dimensions



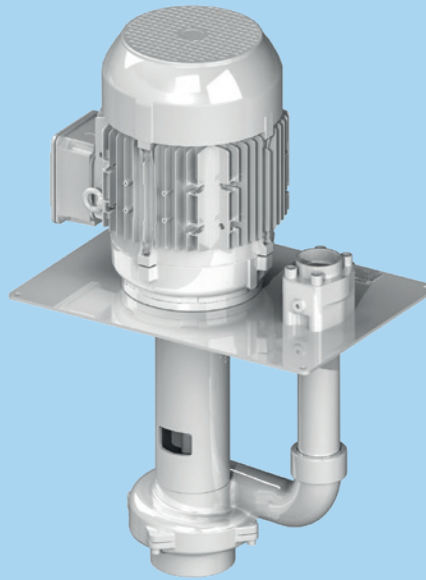
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



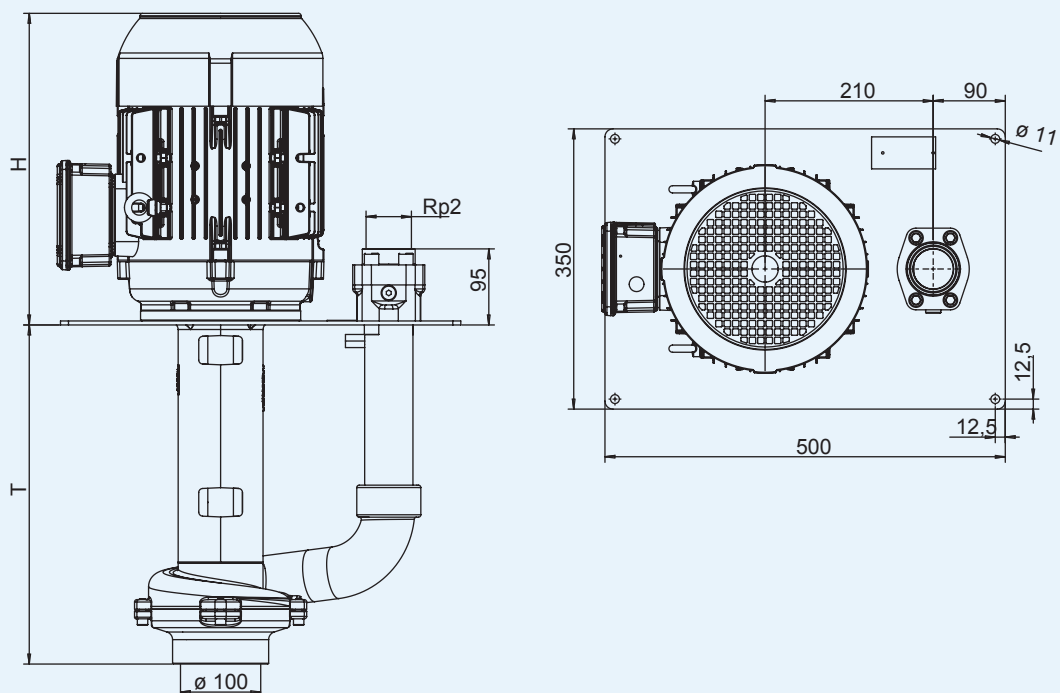
TSL 50 contaminated medium pump



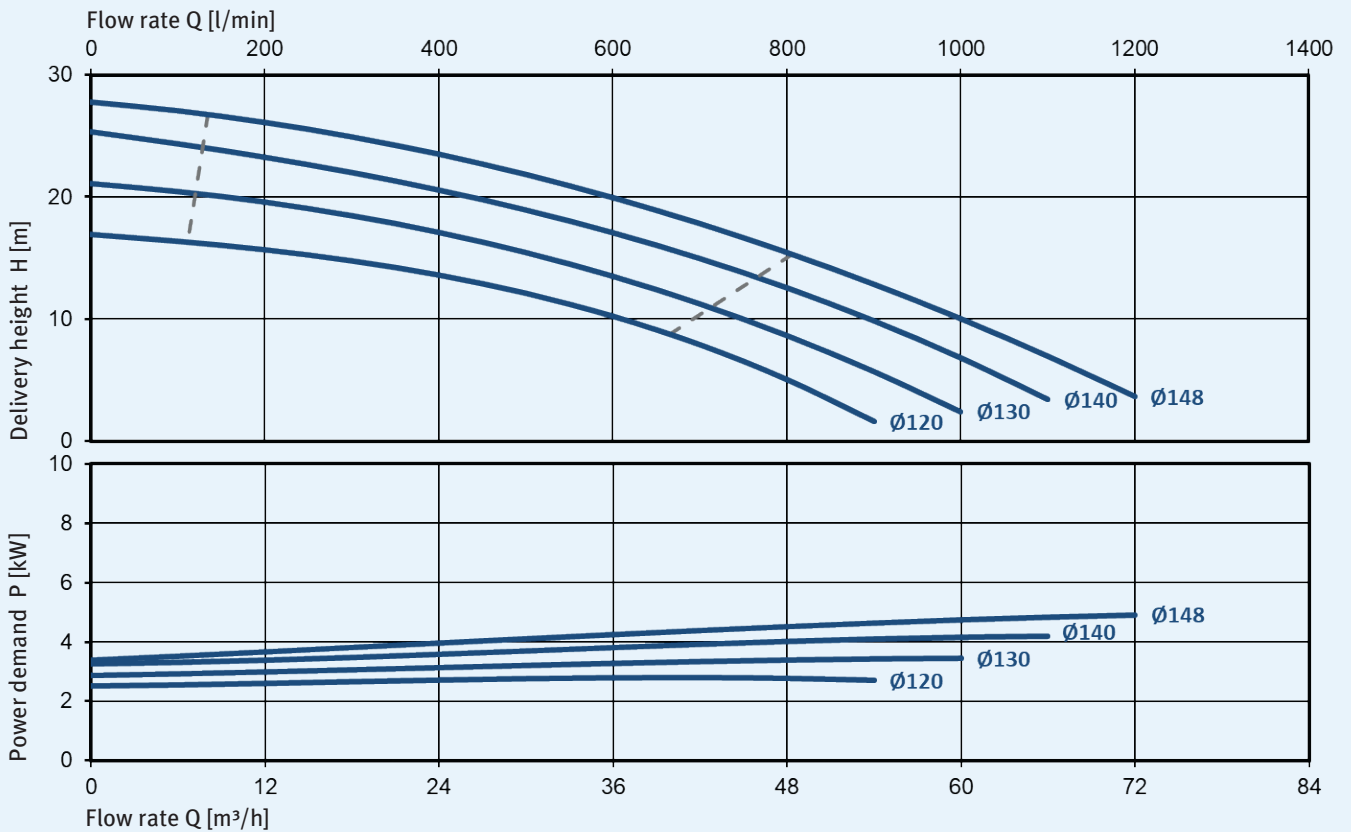
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level [dB(A)]
TSL 50-.. /30 425	425	327	60	50	3.0	62
TSL 50-.. /40 425	425	352.5	70	50/60	4.0	62/66
TSL 50-.. /55 425	425	389	93	50/60	5.5	63
TSL 50-.. /30 860	860	327	74	50	3.0	62
TSL 50-.. /40 860	860	352.5	84	50/60	4.0	62/66
TSL 50-.. /55 860	860	389	107	50/60	5.5	63

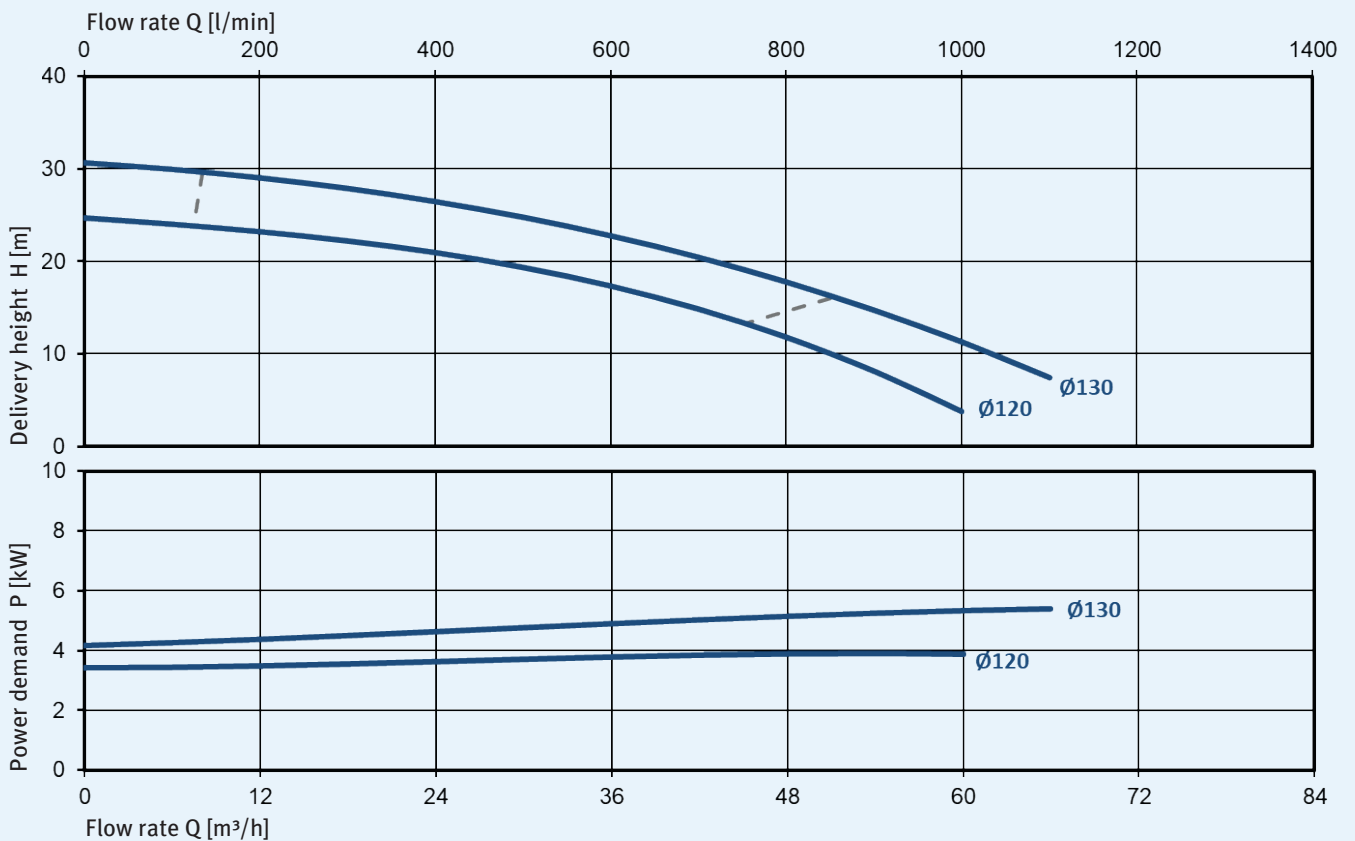
Dimensions



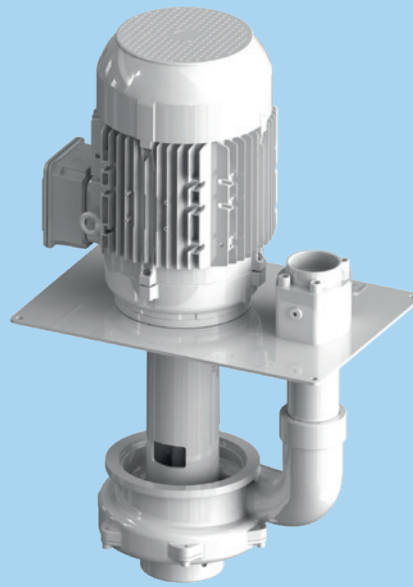
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



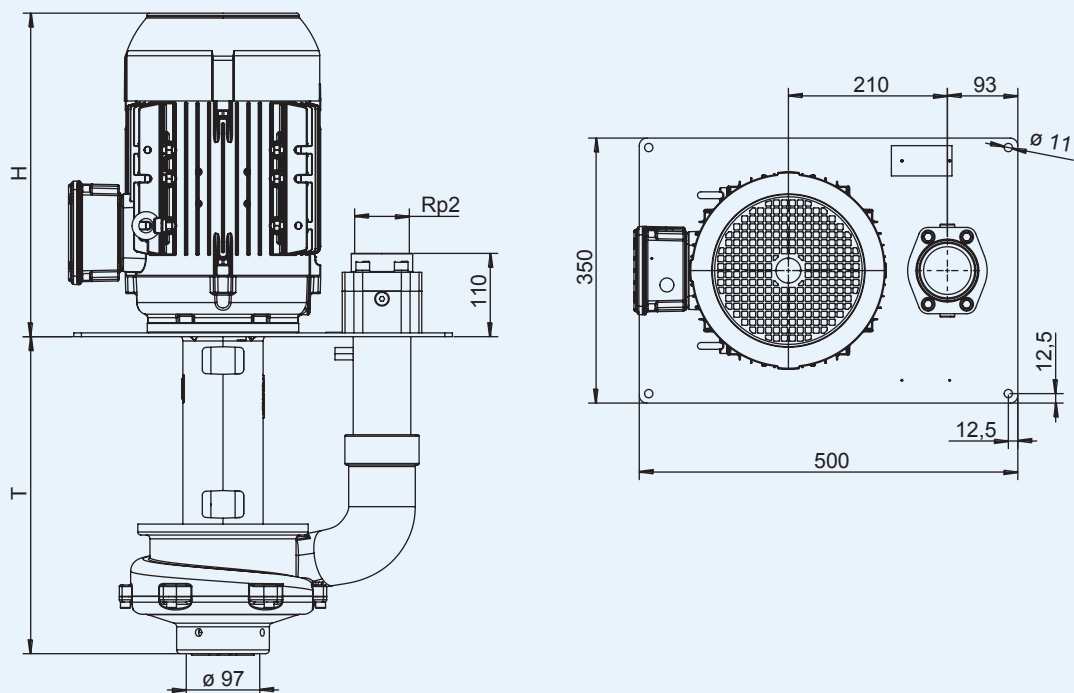
TSL 65 contaminated medium pump



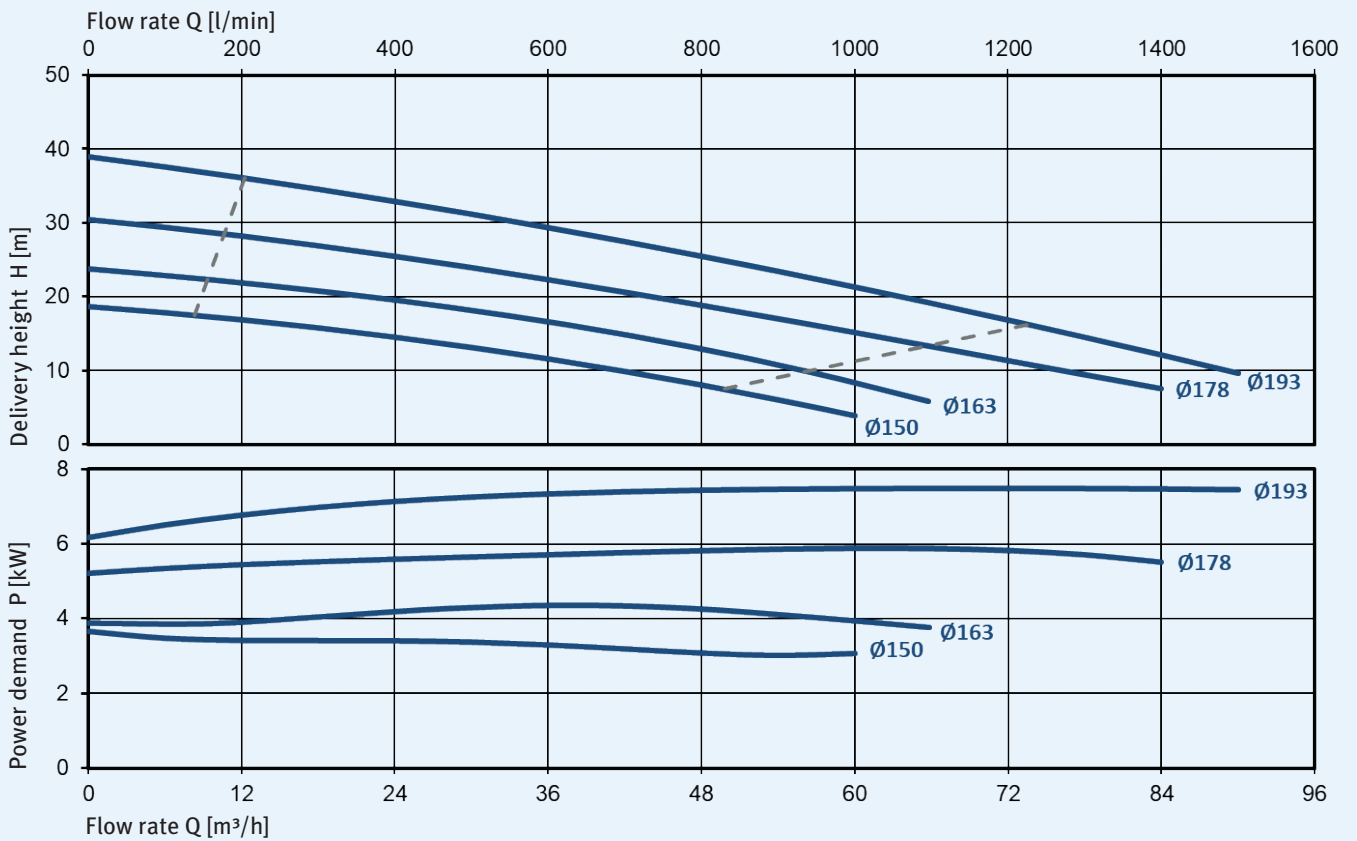
Variations

Type	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]	Sound pressure level [dB(A)]
TSL 65-.. /55 420	420	389	104	50	5.5	63
TSL 65-.. /75 420	420	428	104	50/60	7.5	63
TSL 65-.. /55 855	855	389	118	50	5.5	63
TSL 65-.. /75 855	855	428	118	50/60	7.5	63

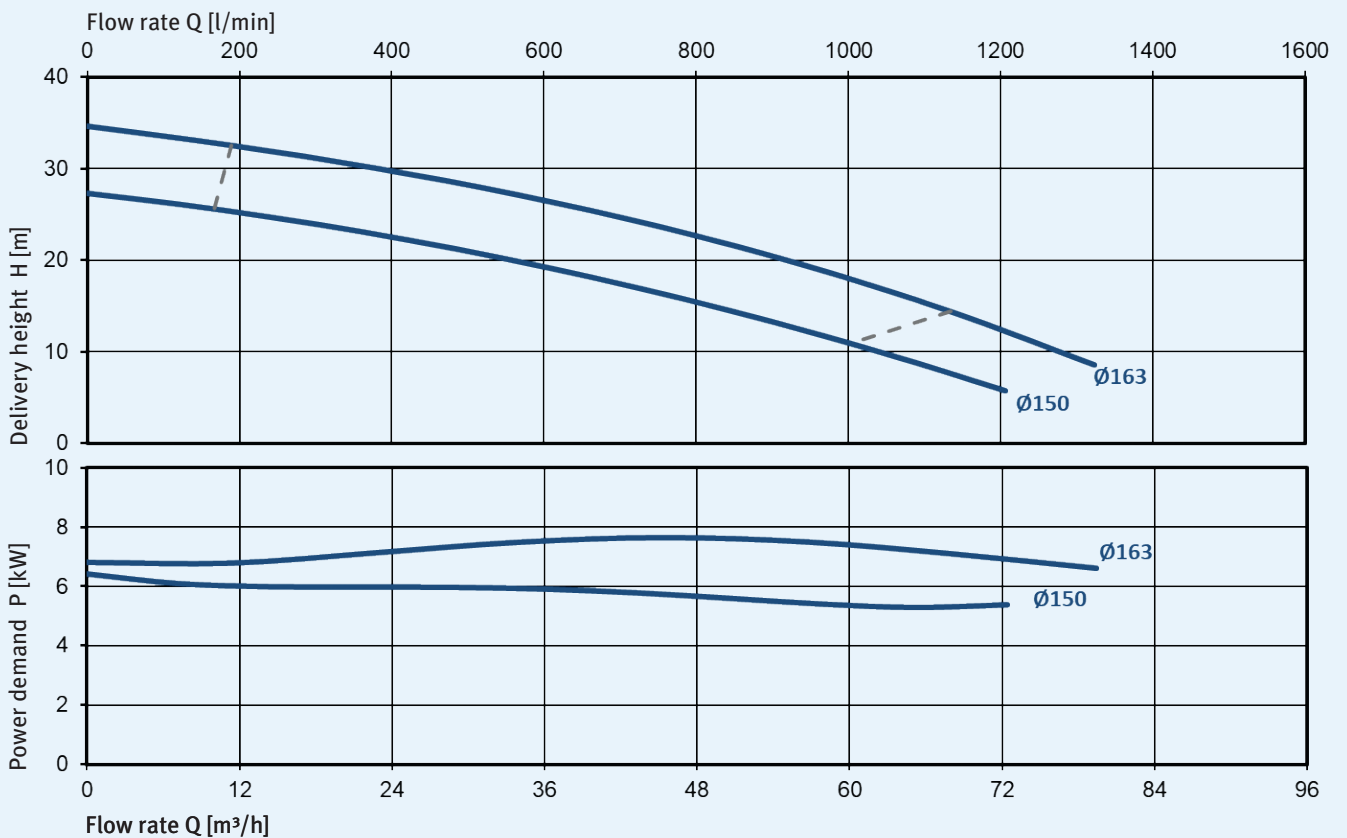
Dimensions



Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s

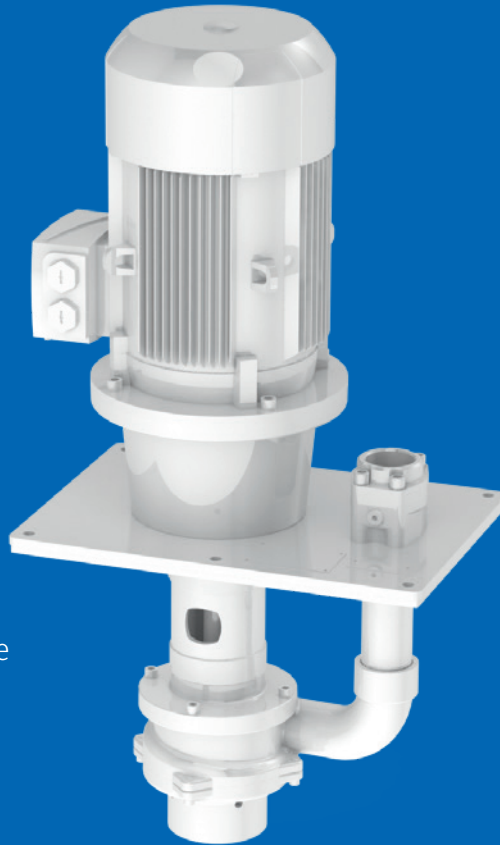


Shredder pumps

KNOLL TSC shredder pumps are cooling lubricant pumps with an integrated reducer for aluminium chips. These pumps are able to shred long aluminium chips to a size suitable for pumping, and to then transport them together with the cooling lubricant to the central treatment station. This eliminates the need for an additional chip reducer.

Properties

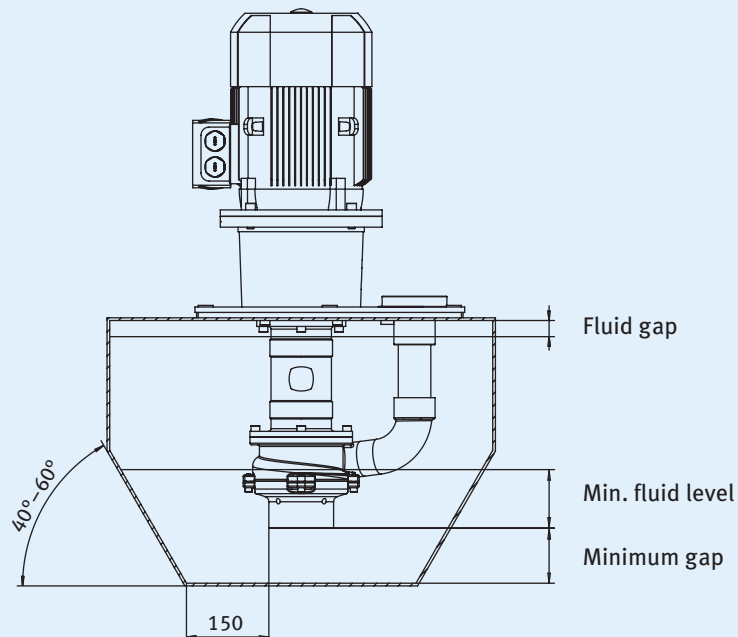
- Flexible design with standard-dimensioned motor
- Energy efficient in combination with a frequency inverter
- The bearing is protected by a rotary shaft seal
- Rigid shaft with the cutting head mounting in a bronze precision bearing
- Durable and low-maintenance thanks to hardened hydraulic and reducer components
- Semi-open radial impeller
- ST impeller material



Dimensions

Container design

Minimum volume: 250 l
Minimum wall thickness: 5 mm



Maximum performance data

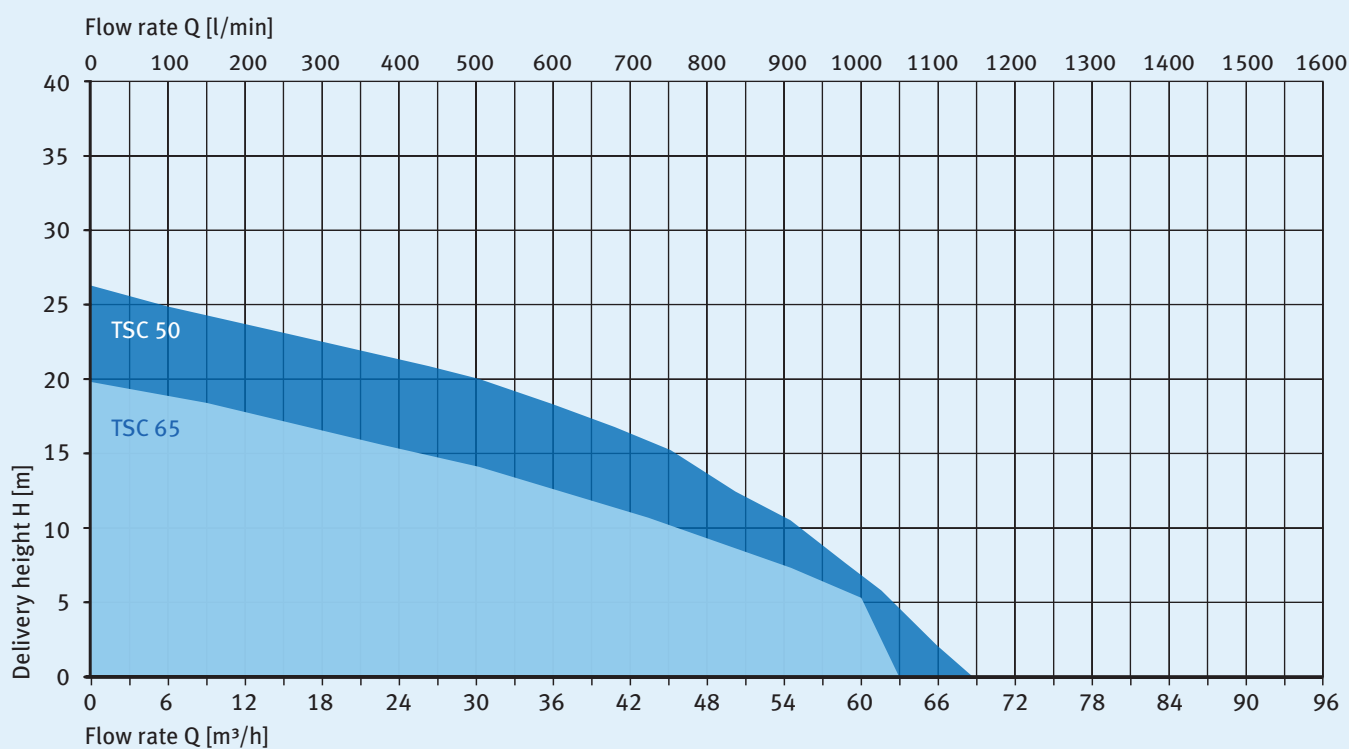
Type	Air proportion vol. [%]	Volume flow [l/min]	Delivery height [m]	Chip thickness [mm]	Chip transport [g/l]
TSC 50	25	1000	26	0,5	7
TSC 65	25	1000	20	0,5	10

Fluid level

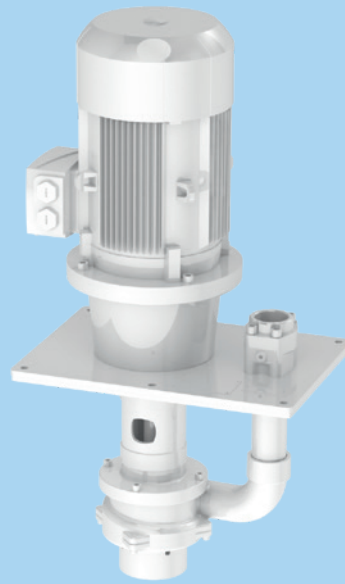
Type	Minimum gap [mm]	Min. fluid level [mm]	Fluid gap [mm]
TSC 50	70	90	40
TSC 65	70	100	30 (170*)

* Dimension valid for TSC 65-.../... 500

Characteristic curve diagram



TSC 50 shredder pump

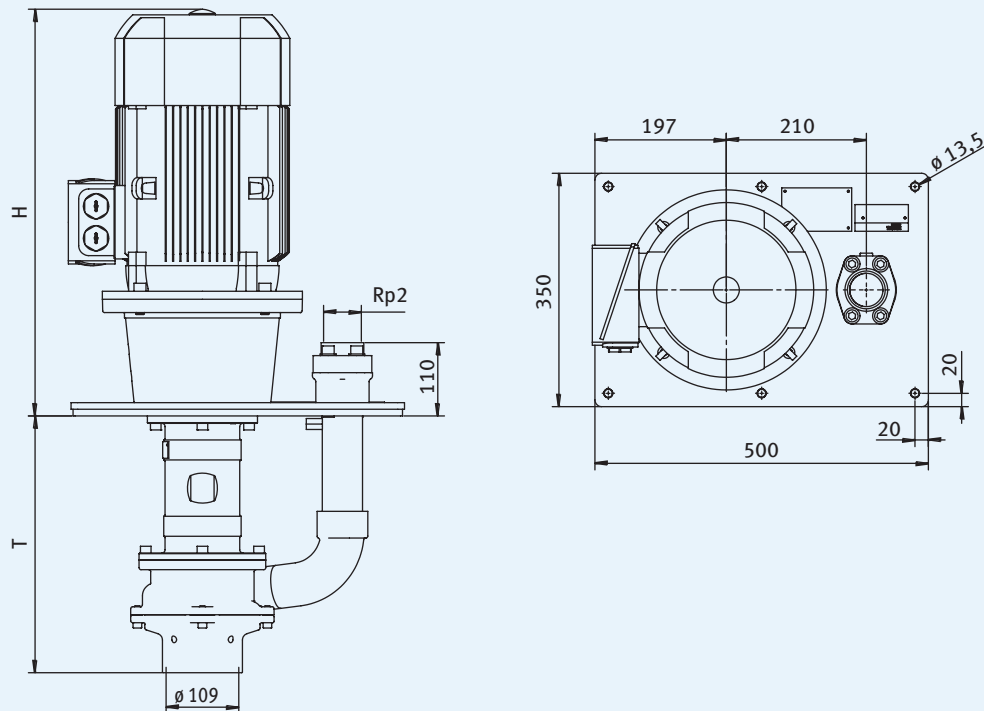


Variations

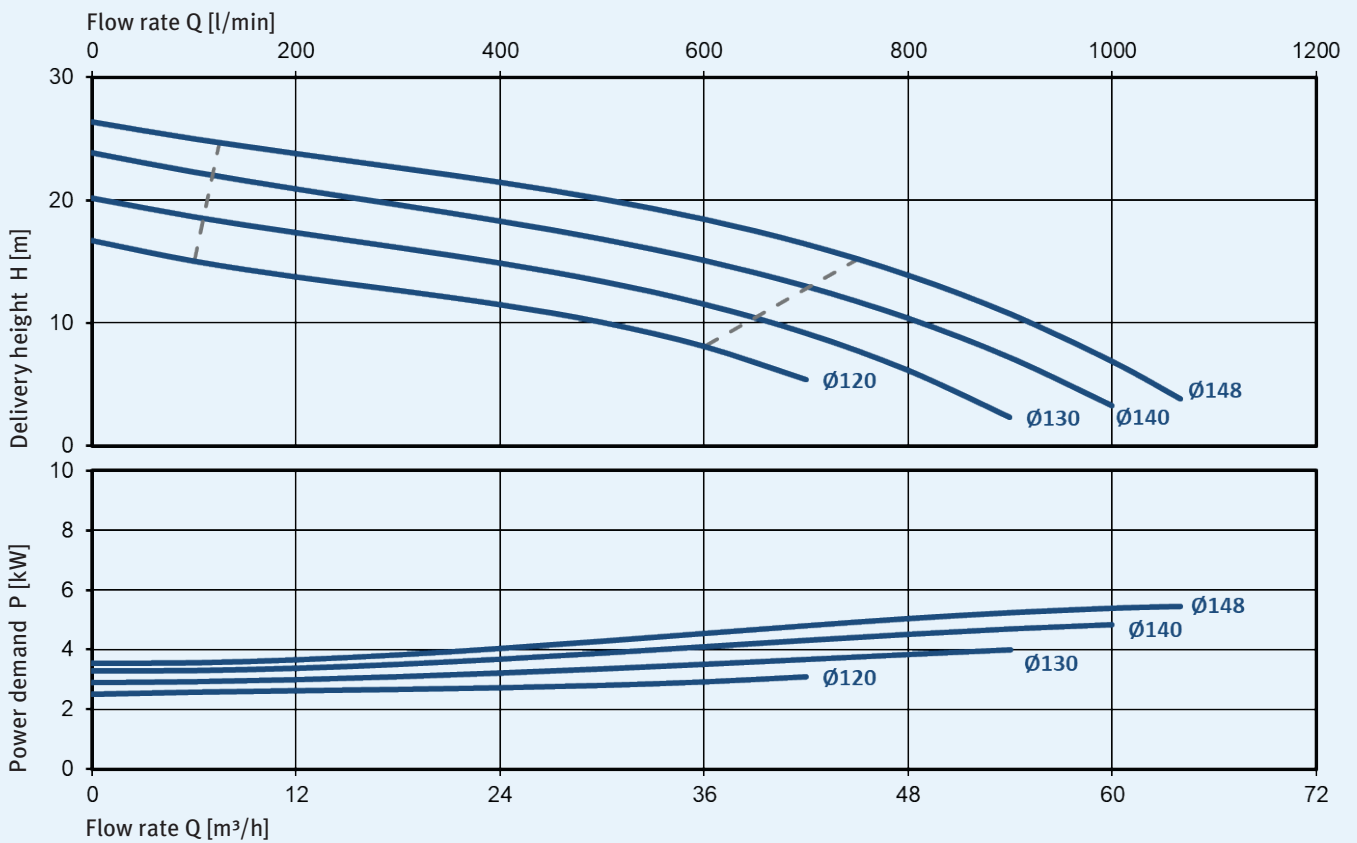
Type	T* [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]
TSC 50-../40 375	375	509	82	50	4.0
TSC 50-../40 485	485	509	87	50	4.0
TSC 50-../55 375	375	560	93	50/60	5.5
TSC 50-../55 485	485	560	99	50/60	5.5
TSC 50-../75 375	375	610	106	50/60	7.5
TSC 50-../75 485	485	610	111	50/60	7.5

*The following depths of immersion can be provided on request: 595 mm, 705 mm and 815 mm.

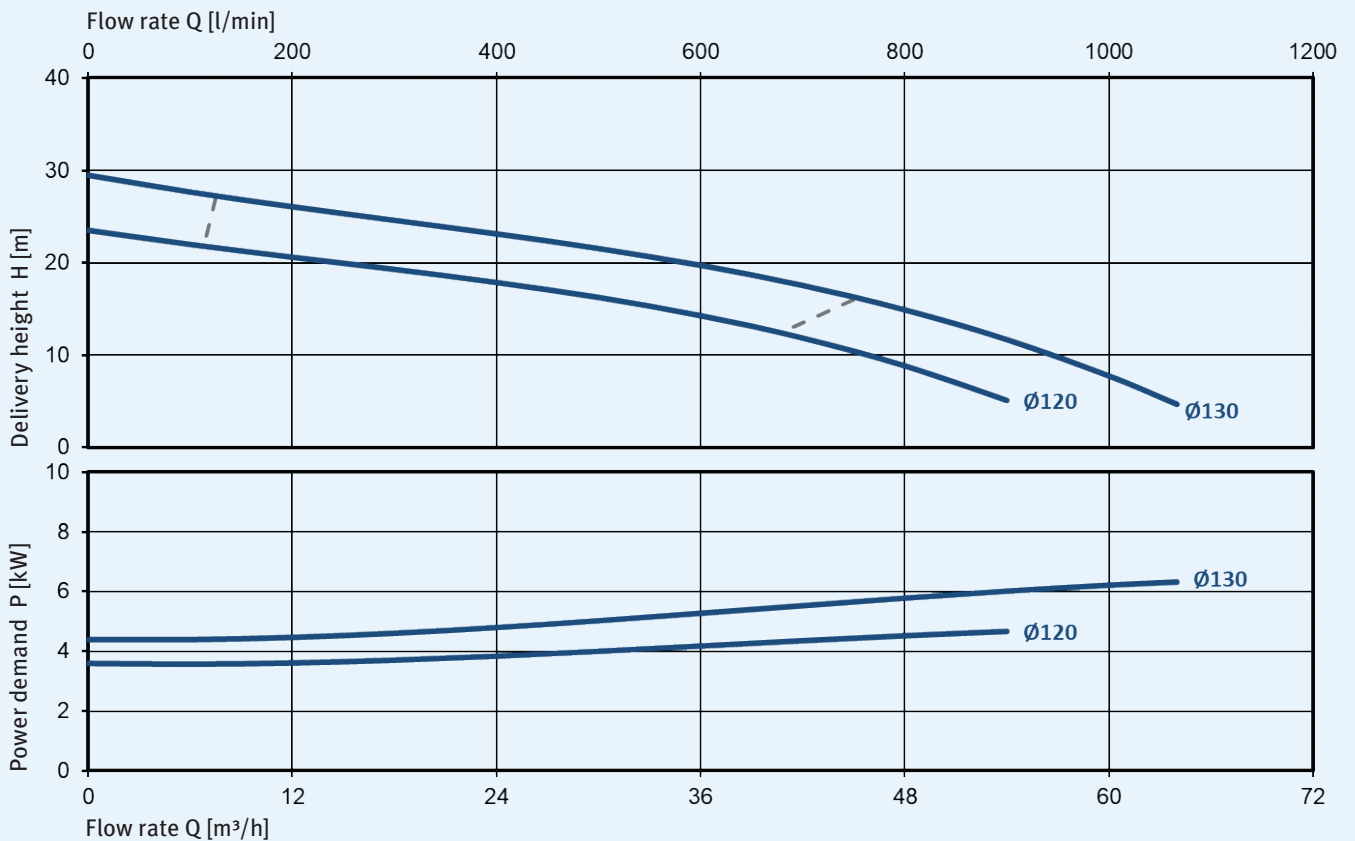
Dimensions



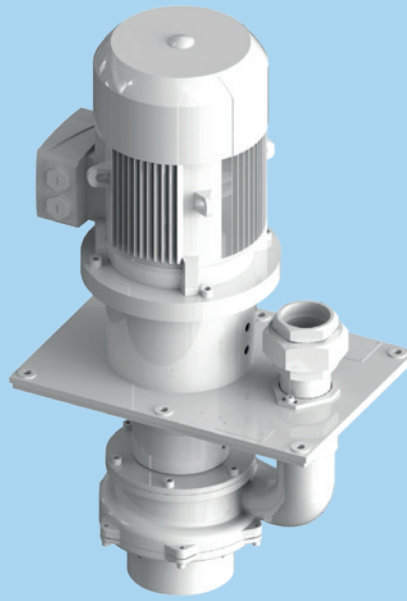
Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



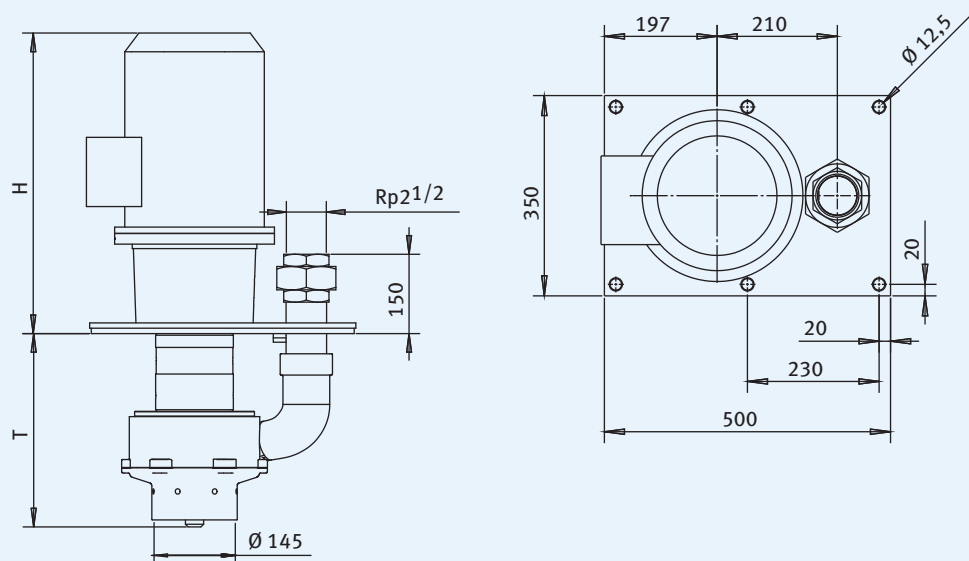
TSC 65 shredder pump



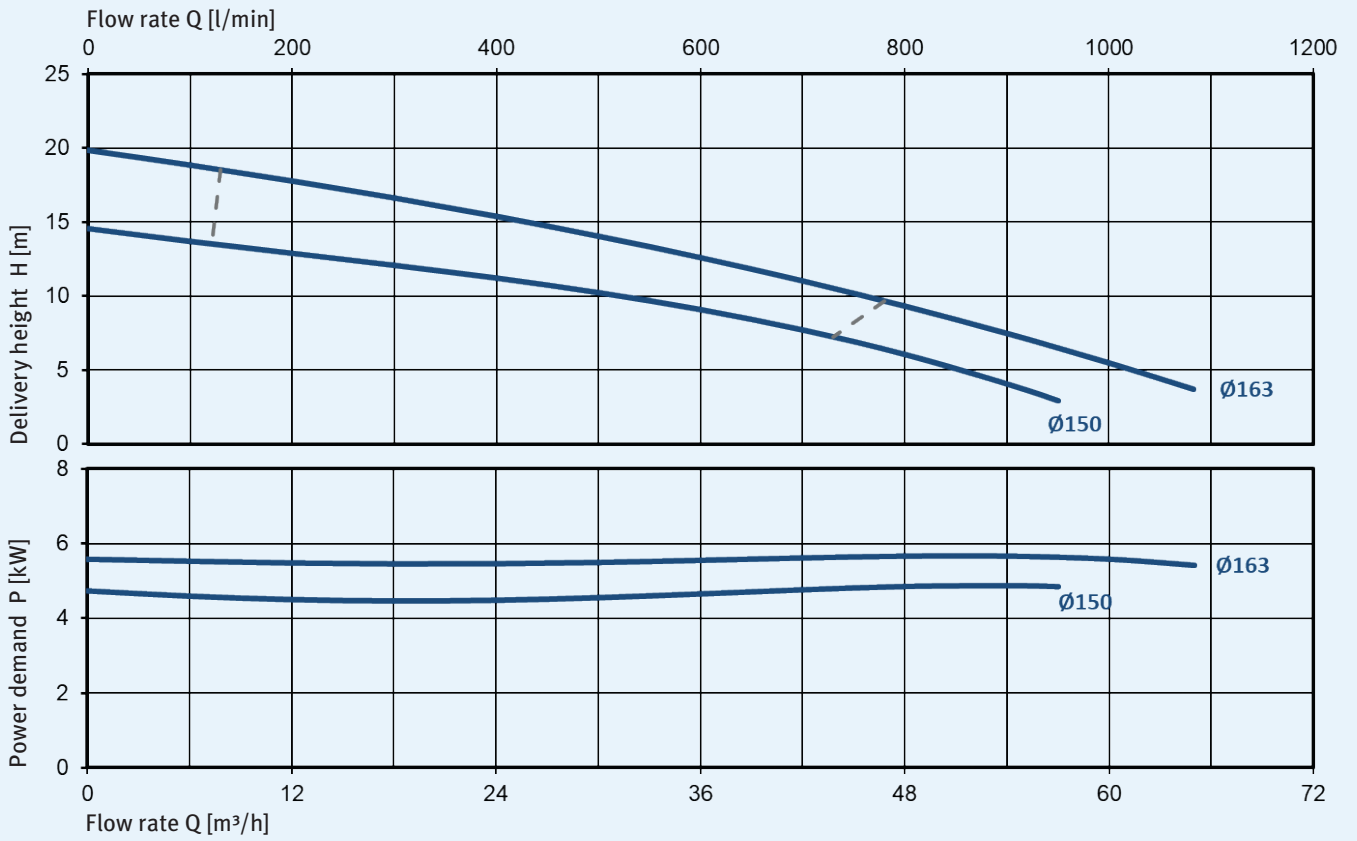
Variations

Typ	T [mm]	H [mm]	Weight [kg]	Frequency [Hz]	Motor output [kW]
TSC 65-50/55 360	363	573	110	50	5.5
TSC 65-63/75 360	363	573	110	50	7.5
TSC 65-50/55 500	501	425	110	50	5.5
TSC 65-63/75 500	501	425	110	50	7.5
TSC 65-50/55 360	363	573	110	60	9.2
TSC 65-50/55 500	501	425	110	60	9.2

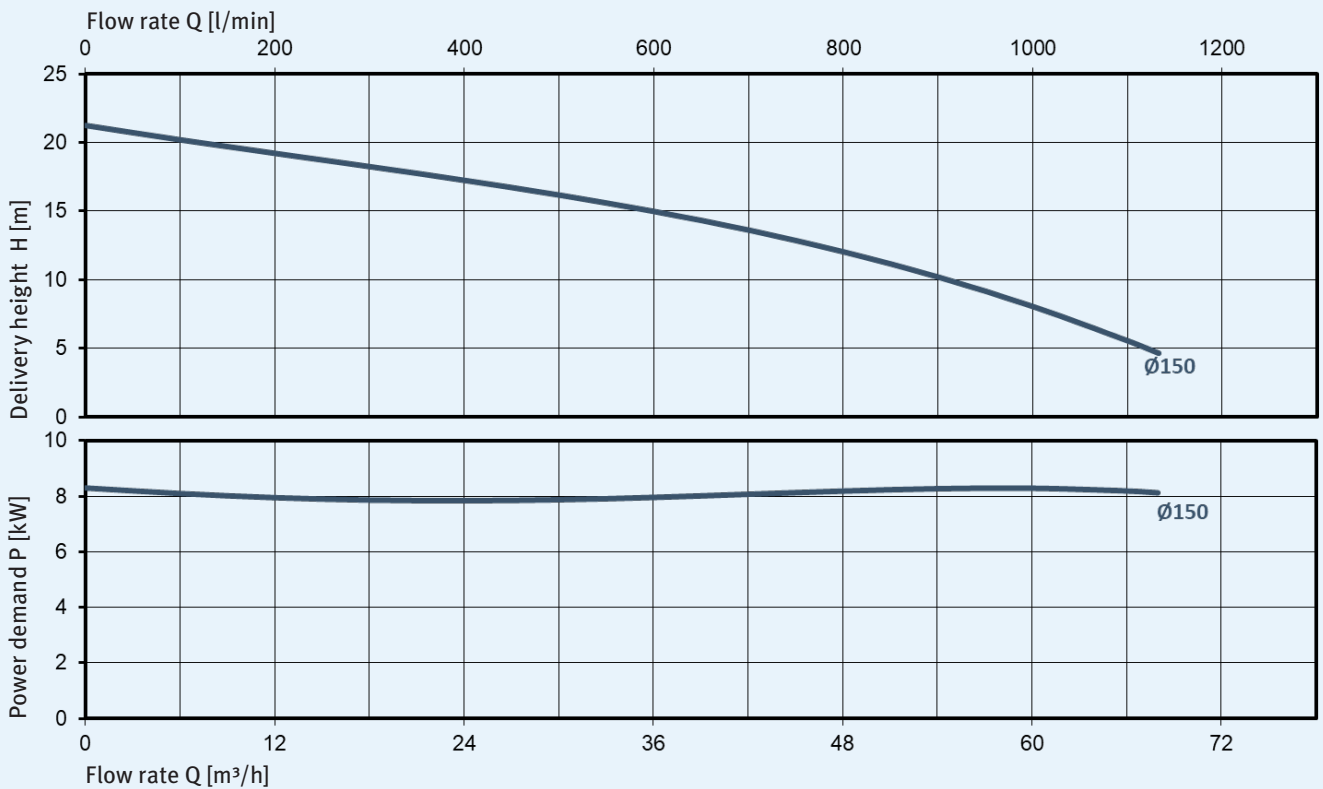
Dimensions



Characteristic curves for 2900 rpm, 50 Hz, 1 mm²/s



Characteristic curves for 3500 rpm, 60 Hz, 1 mm²/s



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