

2017

SCREW SPINDLE PUMPS

COOLING, LUBRICATING,
RINSING, MAINTAINING TEMPERATURES ...



Story



BRINKMANN PUMPS represents over 60 years of the highest quality and reliability made in Germany. More than 200 employees worldwide in engineering, research and development and production worldwide work on customer specific solutions with the same goal: exceeding our customers' expectations with every pump.

From a small centrifugal coolant pump for external cooling to the rugged lifting and cutter pumps to the high pressure screw spindle pumps, BRINKMANN PUMPS is the only supplier to cover all your coolant pump needs. Performance and reliability of our pumps over many decades has machine tool designers and manufacturers worldwide convinced of our unsurpassed quality and service.

Engineering

Each BRINKMANN Pump is embedded with often many years of research, including internal and external product development and in-house and field testing.

Being directly in contact with our global customer base, we can continuously deliver innovations and market driven pump solutions. For example, our patented quick suctioning immersion pumps, which are uniquely capable of handling coolants with a high percentage of air-entrainment.

In order to provide custom solutions in a cost effective way, we have developed a highly sophisticated modular design system. This system allows us to quickly and economically develop and customize application specific products for each customer.





Technical Information	
Electrical Features	4 – 8
Control / Regulation	9 – 12
Models and Applications for High Pressure Screw Pumps	13 – 15
Accessories	
Pressure relief valves	48 – 50
Pressure gauge, suction protection	51
G4 version	51
SAE flange	51
Pump system, fully assembled	52 – 56
Questionnaire	57



High Pressure Pumps	Screw spindles	50 Hz
High Pressure Pumps BFS1 FFS1, 50 Hz	Screw spindles High pressure 2.6 ... 20.1 l/min 10 ... 150 bar	16 – 17
High Pressure Pumps BFS2 FFS2, 50 Hz	Screw spindles High pressure 7 ... 47.4 l/min 10 ... 150 bar	18 – 21
High Pressure Pumps TFS3 FFS3, 50 Hz	Screw spindles High pressure 16.2 ... 98.5 l/min 10 ... 150 bar	22 – 23
High Pressure Pumps TFS4 FFS4, 50 Hz	Screw spindles High pressure 32 ... 194 l/min 10 ... 120 bar	24 – 25
High Pressure Pumps TFS5 FFS5, 50 Hz	Screw spindles High pressure 80 ... 412 l/min 10 ... 120 bar	26 – 29
High Pressure Pumps TFS6 FFS6, 50 Hz	Screw spindles High pressure 165 ... 725 l/min 10 ... 80 bar	30 – 31



High Pressure Pumps	Screw spindles	60 Hz
High Pressure Pumps BFS1 FFS1, 60 Hz	Screw spindles High pressure 3.2 ... 24.4 l/min 10 ... 150 bar	32 – 33
High Pressure Pumps BFS2 FFS2, 60 Hz	Screw spindles High pressure 10.2 ... 57.6 l/min 10 ... 150 bar	34 – 37
High Pressure Pumps TFS3 FFS3, 60 Hz	Screw spindles High pressure 22.8 ... 119.5 l/min 10 ... 150 bar	38 – 39
High Pressure Pumps TFS4 FFS4, 60 Hz	Screw spindles High pressure 45 ... 235 l/min 10 ... 120 bar	40 – 41
High Pressure Pumps TFS5 FFS5, 60 Hz	Screw spindles High pressure 105 ... 500 l/min 10 ... 120 bar	42 – 45
High Pressure Pumps TFS6 FFS6, 60 Hz	Screw spindles High pressure 213 ... 878 l/min 10 ... 80 bar	46 – 47



Electrical Features

Motors acc. to EN 60034-1

Protective system	IP55
Insulation class	F
Number of poles	2
Efficiencies	EN 60034-30, IE3 ≥ 0,75 kW

	50 Hz		60 Hz	
	220 V – 240 V Δ 380 V – 415 V Υ	380 V – 415 V Δ	460 V Υ	460 V Δ
up to 5.5 kW	Standard	●	Standard	●
as of 6.0 kW	–	Standard	–	Standard

In accordance with DIN EN 60034-1, **Zone A**, and permanent operation, the voltage tolerance is $\pm 5\%$ and the frequency tolerance is $\pm 2\%$.

Special voltages are available upon request:

	200 V	200 V 220 V	380 V	400 V	415 V	440 V	480 V	500 V	575 V	230 V $\Upsilon\Upsilon$ 460 V Υ
50 Hz	●	–	●	●	●	–	–	●	–	–
60 Hz	–	●	●	●	–	●	●	–	●	●

● available – not available

Other voltages upon request.

For special demands, versions for use with a standardized voltage 50 and 60 Hz (Transformer usage) are possible after consulting with the company, e. g. 3 x 400 V, $\pm 5\%$, 50 – 60 Hz.

Motors as of 6 kW

Motors are Δ connected.

The motor design allows Υ/Δ -starting, if required.

Screw-spindle pumps used for Υ/Δ -starting must be started without pressure.

Soft-starting devices are a recommendable alternative to Υ/Δ -starting.

Switching-on frequency

Motors less than 3 kW ►
maximum 200 times per hour

Motors from 3 kW to 4 kW ►
maximum 40 times per hour

Motors from 5 kW to 9 kW ►
maximum 20 times per hour

Motors as of 11 kW ►
maximum 15 times per hour

Higher on/off cycling frequencies are available upon request.

Comparison of motor efficiency classes worldwide

Efficiency Class	Europe	North America, Australia, New Zealand	China
Super premium efficiency	IE4	–	Grade 1
Premium efficiency	IE3	NEMA Premium	Grade 2
High efficiency	IE2	EPAct	Grade 3

IE = International Efficiency

Electrical Features

Non-European Regulations, Brinkmann motors



Approved by UL with „UL Recognized Component Mark“ for USA acc. to UL 1004-1 and for Canada acc. to CSA C22.2 No. 100-14 (UL-File E233349)



Brinkmann Motors up to 15 kW, 60 Hz, and up to max. 600 V are available with UL Recognized Component Mark approval as special designs.

Brinkmann motors ranging from 2.3 kW to 13 kW, 50 Hz, are available with the China Energy Label GB18613-2012, Grade 2 upon request.



CC311B

Compliance Certification number CC311B according to 10 C.F.R. §431 (NEMA PREMIUM EFFICIENCY)

Brinkmann motors ranging from 0.86 kW to 15 kW, 60 Hz, are available with NEMA PREMIUM MG 1 upon request.

Brinkmann Motors Options	50 Hz					60 Hz								
	200 V	380 V	400 V	415 V	500 V	200 V 220 V	380 V	400V	440 V	460 V	230 V 460 V	480 V	230 V 480 V	575 V
UL/CSA	–	–	–	–	–	●	●	●	●	●	●	●	●	●
CEL (Grade 2) ≥ 2.3 kW	●	●	●	–	–	–	–	–	–	–	–	–	–	–
NEMA PREMIUM MG 1 ≥ 0.86 kW	Y 0.86 – 6.3 kW	–	–	–	–	●	●	●	–	●	●	●	●	○
	Δ 3.45 – 15 kW	–	–	–	–	–	●	●	–	●	–	●	–	–
	YY/Y 0.86 – 15 kW	–	–	–	–	–	–	–	○	–	–	●	–	●

● available – not available ○ upon request Additional country-specific approvals upon request.

Non-European Regulations, Standard motors

Upon request. Depending on actual motor rating and sizing (Power / Motor efficiency class) deviations in pump and motor configurations are possible.

Current / Rated current

The current (I_{catalog}) stated at the name plates is used for the sizing of electronic components.

Motor < 0.75 kW: $I_{\text{max}} = I_{\text{catalog}}$

Motor ≥ 0.75 kW: $I_{\text{max}} = 1,05 \times I_{\text{catalog}}$

For extended voltage ranges we mention only the highest current value in our data sheets.



Technical motor data IE3

Three-phase induction motor 2 pole, thermal protection class F, grade of protection IP 55

Brinkmann motors

	Power 50 Hz / 60 Hz kW	Current 2 pole 50 Hz A		Noise level max. dBA / 50 Hz	Current 2 pole 60 Hz A		Noise level max. dBA / 60 Hz
		Y 380 V – 415 V	Δ 380 V – 415 V		Y 460 V	Δ 460 V	
		IE3	B 1.3 / 1.49		2.80 – 2.75	–	
B 1.5 / 1.75	3.20 – 3.05		–	63	3.1	–	67
B 1.7 / 1.95	3.60 – 3.60		–	63	3.5	–	67
B 1.9 / 2.18	3.95 – 3.90		–	63	3.9	–	67
B 2.2 / 2.55	4.50 – 4.35		–	63	4.4	–	67
B 2.6 / 2.94	5.35 – 5.20		–	63	5.1	–	67
B 3.0 / 3.45	6.20 – 6.20		–	63	6.0	–	67
B 3.3 / 3.8	6.70 – 6.60		–	71	6.4	–	75
B 4.0 / 4.55	8.30 – 8.35		–	71	7.9	–	75
B 5.0 / 5.75	10.0 – 9.65		–	71	9.5	–	75
B 5.5 / 6.3	10.9 – 10.4		–	74	10.4	–	77
B 7.5 / 8.6	–		14.3 – 13.4	74	–	13.7	77
B 9.0 / 10.3	–		16.7 – 15.6	74	–	15.8	78
B 11.0 / 12.6	–		20.1 – 18.8	75	–	19.5	80
B 13.0 / 15.0	–	24.2 – 23.5	77	–	23.6	80	

Standard motors

	Power 50 Hz / 60 Hz kW	Current 2 pole 50 Hz A	Noise level dBA / 50 Hz	Current 2 pole 60 Hz A	Noise level dBA / 60 Hz	Current 4 pole 50 Hz A	Noise level dBA / 50 Hz	Current 4 pole 60 Hz A	Noise level dBA / 60 Hz
		Y 400 V		Y 460 V		Y 400 V		Y 460 V	
		IE3	0.75 / 0.86	1.56	63	1.63	67	1.75	56
1.1 / 1.27	2.25		63	2.25	67	2.4	59	2.35	61
1.5 / 1.75	3.0		68	2.95	72	3.15	59	3.15	61
2.2 / 2.54	4.2		68	4.2	72	4.4	63	4.25	65
3.0 / 3.45	5.6		70	5.5	74	5.9	63	5.8	65
4.0 / 4.55	7.4		72	7.2	76	7.9	61	7.7	65
5.5 / 6.3	9.9		72	9.7	76	10.8	67	10.6	71
		Δ 400 V		Δ 460 V		Δ 400 V		Δ 460 V	
IE3	7.5 / 8.6	13.1	72	13.1	75	14.3	67	14.2	71
	11.0 / 12.6	20.0	75	19.5	80	20.5	68	20.0	72
	15.0 / 17.3	27.0	75	27.0	80	28.5	68	28.0	72
	18.5 / 21.3	32.0	75	32.0	80	35.0	69	34.5	71
	22.0 / 25.3	38.5	76	38.9	>80	41.0	71	41.0	73
	30.0 / 33.5*	53.0	76	52.0	>80	55.0	68	55.0	71
	37.0 / 41.5*	65.0	77	63.0	>80	66.0	68	66.0	70
	45.0 / 51.0*	78.0	77	77.0	>80	80.0	68	81.0	70
	55.0 / 62.0*	95.0	>80	92.0	>80	96.0	69	97.0	70
	75.0 / 86.0	128.0	>80	128.0	>80				
	90.0 / 101.0	152.0	>80	148.0	>80				
110.0 / 123.0	183.0	>80	179.0	>80					

Noise level with +3 dBA tolerance for standard motors.

Depending on actual motor rating and sizing (Power / Motor efficiency class) deviations in pump and motor configurations are possible. Motors from various suppliers will be used, depending on availability.

* Different horsepower rating at 60 Hz, see data sheet for 4 pole operation.

Technical Information

Electrical Features, NEMA MG1 12-12



Technical motor data NEMA Premium

Three-phase induction motor 2 pole, thermal protection class F, grade of protection IP 55

Brinkmann motors

	Power 60 Hz kW / HP	Current 2 pole 60 Hz A		Noise level max. dBA / 60 Hz
		Y 460 V	Δ 460 V	
MG1 12-12	B 1.49 / 2.0	2.7	–	67
	B 1.75 / 2.3	3.1	–	67
	B 1.95 / 2.6	3.5	–	67
	B 2.18 / 2.9	3.9	–	67
	B 2.55 / 3.4	4.4	–	67
	B 2.94 / 3.9	5.1	–	67
	B 3.45 / 4.6	6.0	–	67
	B 3.80 / 5.1	6.4	–	75
	B 4.55 / 6.1	7.9	–	75
	B 5.75 / 7.7	9.5	–	75
	B 6.30 / 8.4	10.4	–	77
	B 8.60 / 11.5	–	13.7	77
	B 10.3 / 13.8	–	15.8	78
	B 12.6 / 16.9	–	19.5	80
B 15.0 / 20.1	–	23.6	80	

Standard motors

	Power 60 Hz kW / HP	Current 2 pole 60 Hz A	Noise level dBA / 60 Hz	Current 4 pole 60 Hz A	Noise level dBA / 60 Hz
		Y 460 V		Y 460 V	
MG1 12-12	0.75 / 1.0	1.45	67	1.59	58
	1.1 / 1.5	1.98	67	2.15	61
	1.5 / 2.0	2.6	72	2.85	61
	2.2 / 3.0	3.65	72	3.8	65
	3.0 / 4.0	4.9	74	5.0	65
	3.7 / 5.0	6.0	76	6.5	65
	5.5 / 7.5	8.6	76	9.3	71
		Δ 460 V		Δ 460 V	
MG1 12-12	7.5 / 10.0	11.5	75	12.4	71
	11.0 / 15.0	17.2	80	18.0	72
	15.0 / 20.0	24.0	80	25.0	72
	18.5 / 25.0	28.0	80	30.5	71
	22.0 / 30.0	34.0	81	36.5	73
	30.0 / 40.0	47.0	81	48.0	71
	37.0 / 50.0	57.0	82	58.0	70
	45.0 / 60.0	69.0	>82	71.0	70
	55.0 / 75.0	83.0	>82	84.0	70
	75.0 / 100.0	112.0	>82	116.0	82
	90.0 / 125.0	132.0	>82	136.0	82
110.0 / 150.0	160.0	>82	168.0	82	

Noise level with +3 dBA tolerance for standard motors.

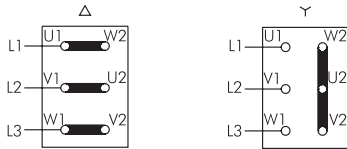
Special voltages and cycles are available upon request. Depending on actual motor rating and sizing (Power / Motor efficiency class) deviations in pump and motor configurations are possible. Motors from various suppliers will be used, depending on availability.

Electrical Features

Circuits

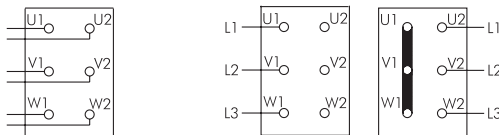
Standard voltage changing Υ / Δ
e. g. 220 – 240 V / 380 – 415 V, 50 Hz

Δ (Delta Connection) Υ (Star Connection)



Optional

Pole-changing motor with 4/2 poles $\Upsilon / \Upsilon\Upsilon$
for 50 % reduced revolutions to choice



Dahlander circ.

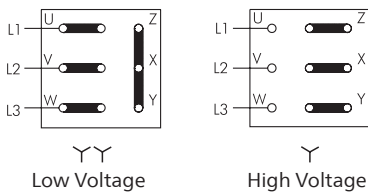
(1500 RPM)

(3000 RPM)

$\Upsilon / \Upsilon\Upsilon$
with pole-switch

4-poles Υ 2-poles $\Upsilon\Upsilon$
without pole-switch

Voltage changing 1 : 2 $\Upsilon\Upsilon / \Upsilon$
e. g. 230 V / 460 V, 60 Hz



Low Voltage

High Voltage

Installation

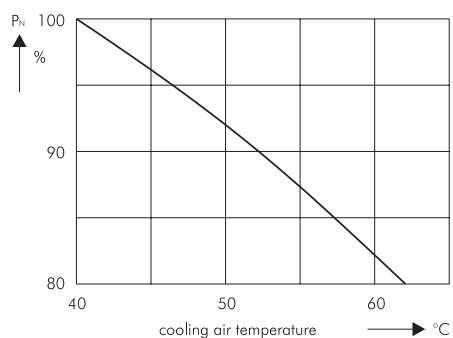
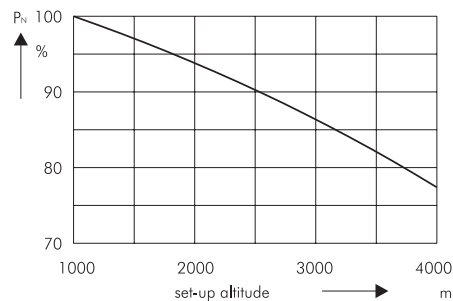
Brinkmann Screw Pump with connector

Motors up to 5.5 kW are available with HAN 10-pin connector; motors 6.0 kW to 13 kW are available with HAN modular plug connector.

Set-up altitude and coolant temperature

The specified power ratings (P_N) and operating values for the motors apply for operating mode S 1 according to EN 60034-1 (continuous operation) at a frequency of 50 Hz, rated voltage, a cooling air temperature (KT) of max. 40 °C and a set-up altitude of up to 1000 m above sea level. The motors can also be used at a cooling air temperature above 40 °C up to max. 60 °C or set-up altitude above 1000 m above sea level. In such cases the power rating must be reduced according to the diagrams, or an appropriately larger motor version or higher heat class has to be selected. However, a deviation from the specified data is necessary when the cooling air temperature is reduced according to table simultaneously at set-up altitudes higher than 1000 m above sea level.

Set-up altitude / m	Maximum cooling air temperature for heat class F / °C
0 up to 1000	40
1000 up to 2000	30
2000 up to 3000	19
3000 up to 4000	9

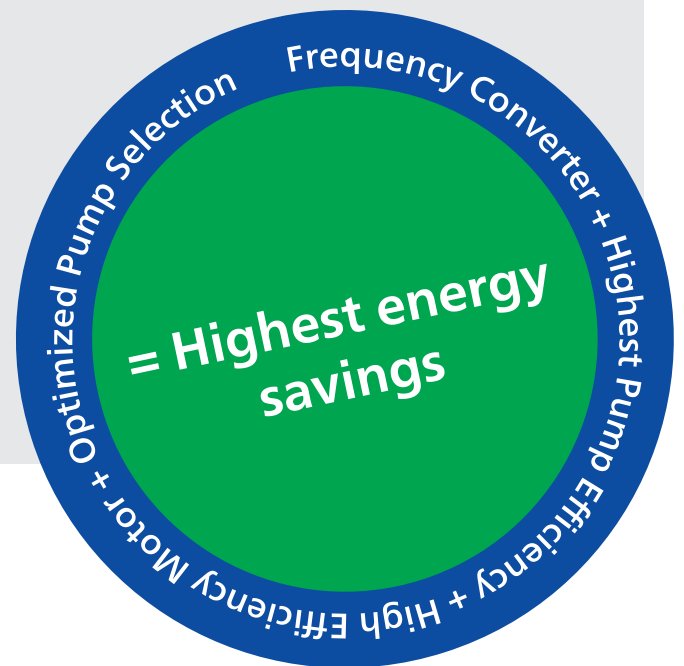


The energy consumption of a screw spindle pump is primarily influenced by the efficiency of the pump, the efficiency of the motor and the sizing of the pump with respect to the working point of the system.

Within the scope of our seminars we offer our support for:

- pump selections
- supply you with detailed information on the use of variable frequency drives
- show potential energy savings through pump controls
- support you locally in retrofitting existing applications and systems

For detailed information please do not hesitate to contact us.



Regulation

Regulation is an operation with which a physical value such as pressure is continuously sensed and compared with a set value. In the event of deviation the regulation device (here a PI controller) provides for the desired adaptation.

With regulation a check is made whether a desired state is achieved or not. This allows for a process to reach a predetermined operating pressure while adjusting the flow of the pump to the required flow of the consumer.

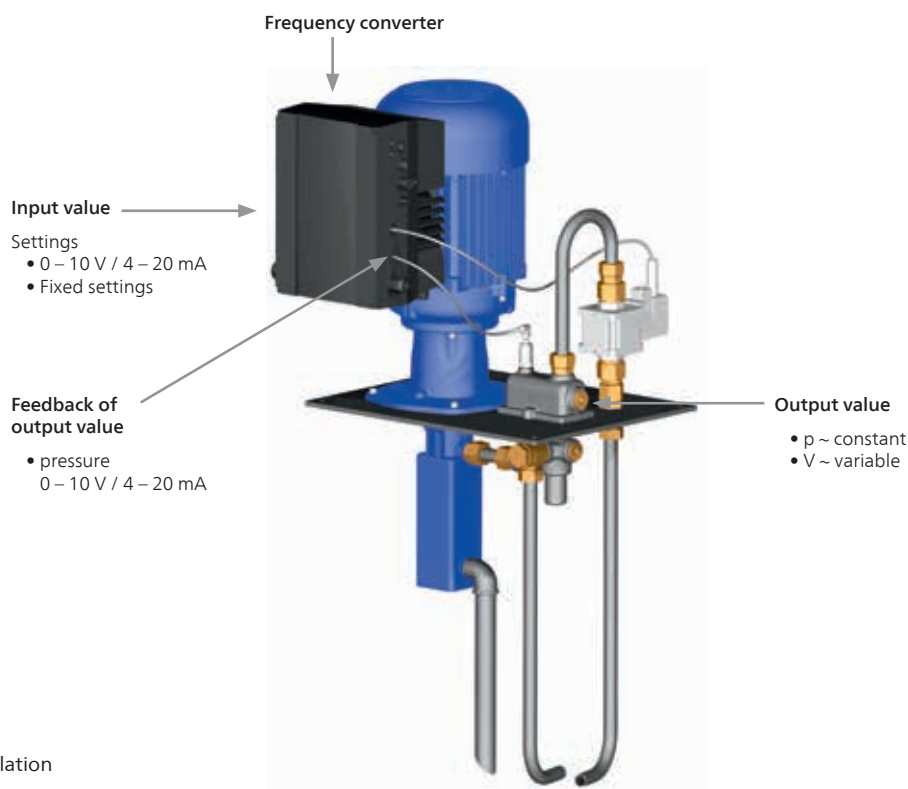


Fig. 1: Scheme of regulation

Variable Speed Control of High Pressure Pumps

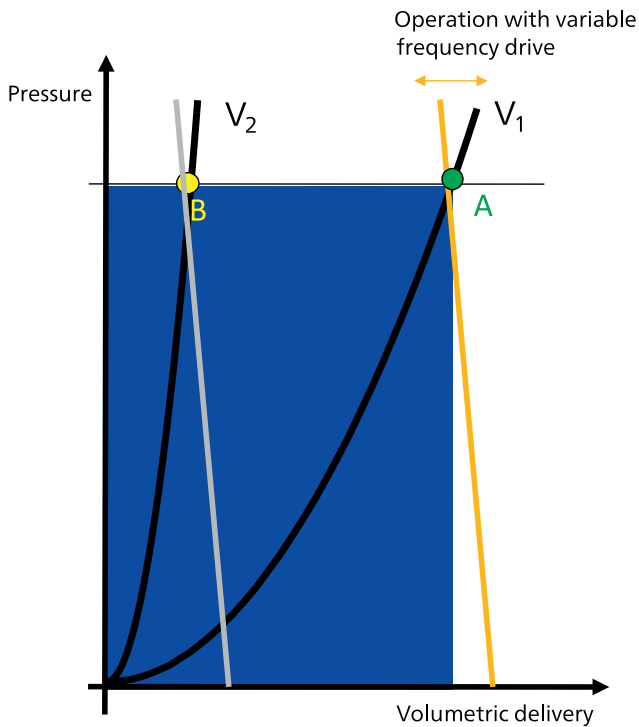


Fig. 2: Potential energy savings of a screw pump with variable frequency drive and two consumers.

Working point	Pressure relief valve	Variable frequency drive	Note
A	closed	no	Design point
B	open	no	Energy loss through the pressure relief valve
B	closed	yes	Energy savings up to 80 % (e.g. pressure regulation)

Pump curve array of a screw pump that is controlled with a VFD

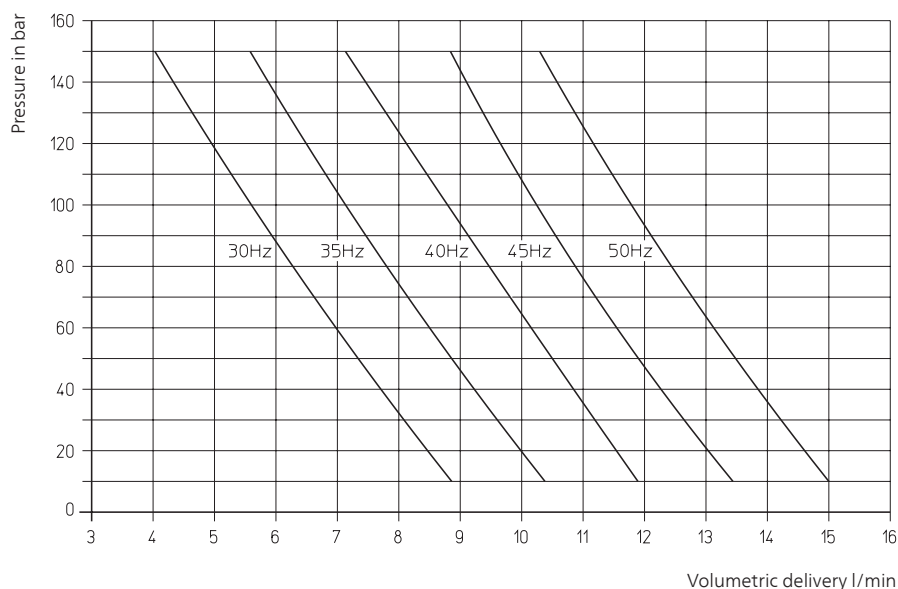
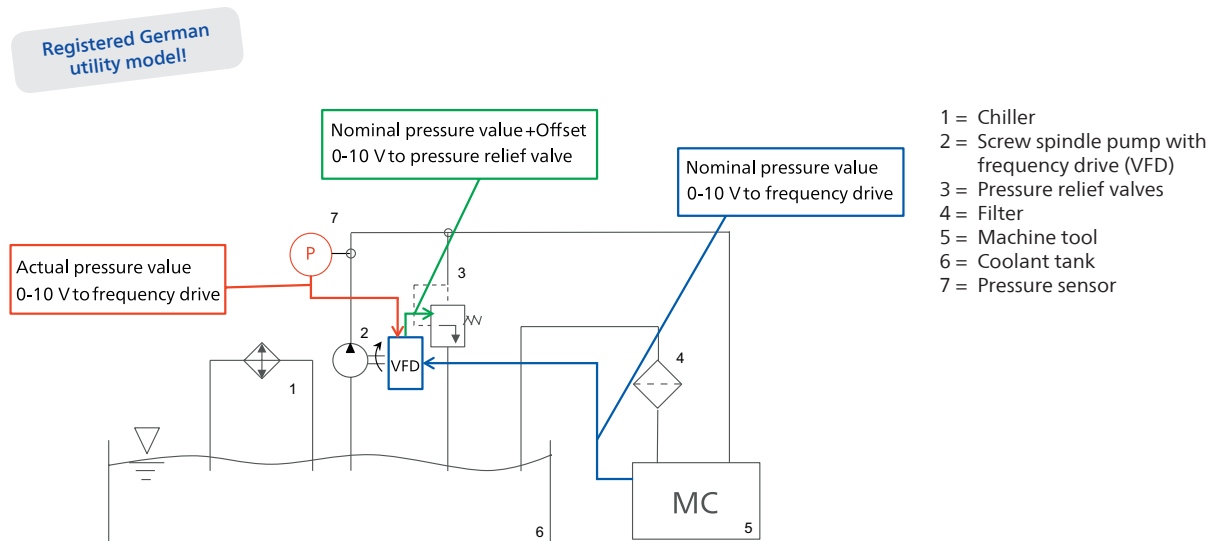


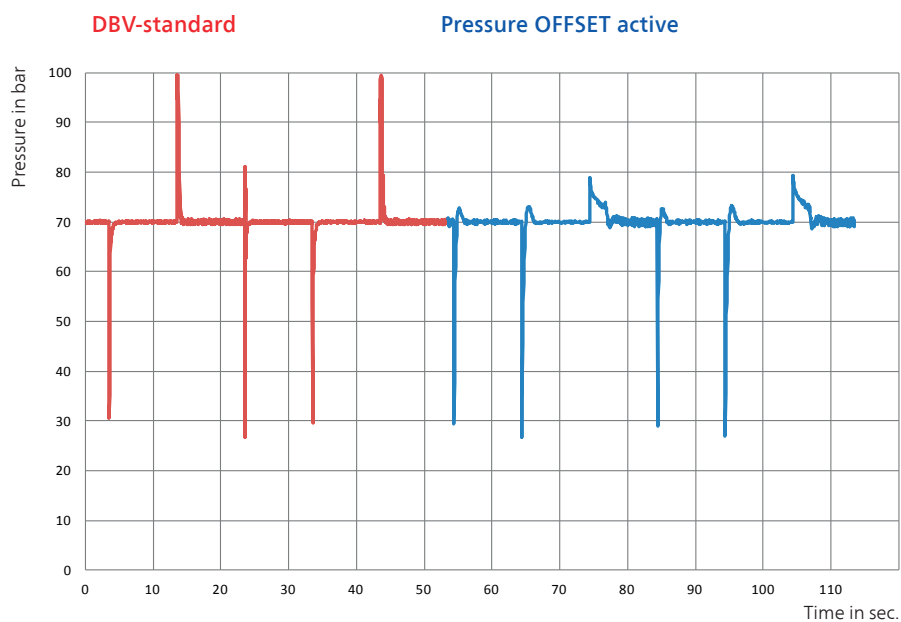
Fig. 3: Example of a BFS130/150 in oil 20 mm²/s

Brinkmann Pumps Offset Regulation for High Pressure Pumps

The target pressure is calculated by the VFD based on the working point and is not supplied by the machine tool. The intelligent control of the valves allows for minimizing potential pressure spikes.



Minimizing of pressure peaks during tool change

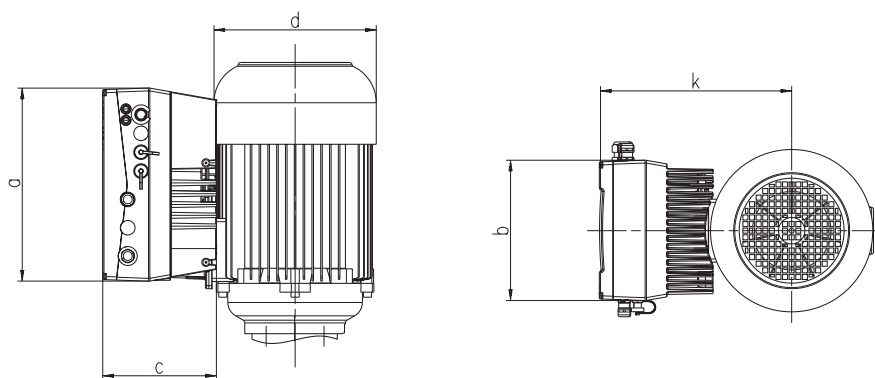


Control / Regulation

TECHNICAL DATA Frequency converter FKO (1.5 – 22 kW)

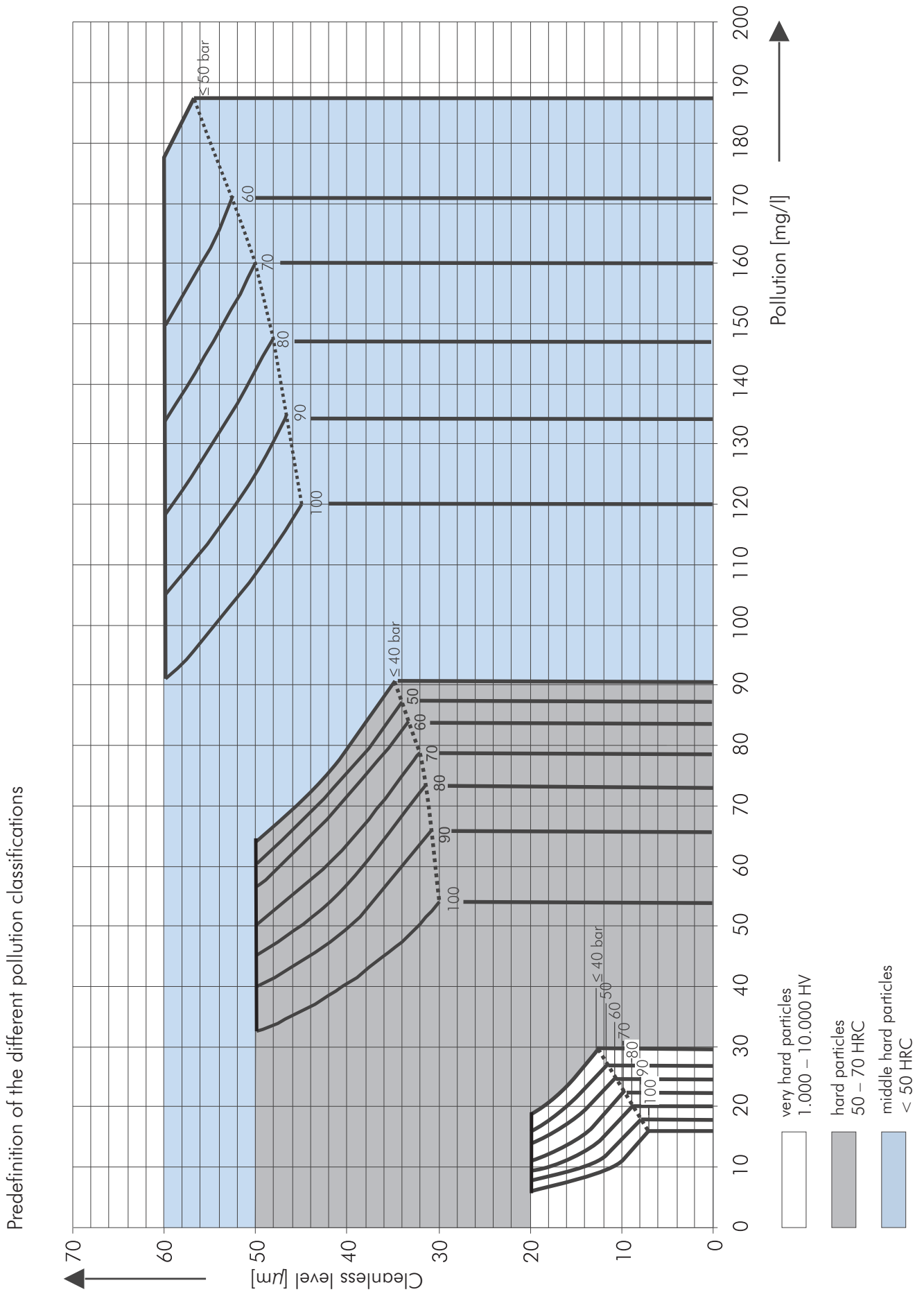
Function	Specification
Rated voltage	3 AC 400 V -10 % ... 480 V +10 %
Rated frequency	50/60 Hz
Output ranges	... 1.5 kW 2.2 – 4 kW 5.5 – 7.5 kW 11 – 22 kW
Housing size	A B C D
Protective system	IP 65 IP 55
EMV approvals acc. to EN61800-3US	C2
Temperature range	-10 °C ... +50 °C
Overload capability	1.5 times rated output current
Protective functions	undervoltage, overvoltage, I ² t-restriction, short circuit, motor temperature, converter temperature, anti-tilt protection
Output frequency range	according to layout at factory
Digital inputs	4
Fixed frequencies	7
Digital outputs	2
Analog inputs	2 analog inputs (0/2 – 10 V, 0/4 – 20 mA)
Analog outputs	0 – 10 V (-I _{max} = 10 mA) or 0 – 20 mA (burden R = 500 Ω)
Process control	PID
Relay outputs	2 x NO contacts 250 V AC 2 A
USB interface	USB on plug M12 (RS485/RS232)
Manual control unit (optional)	MMI with cable
Bus modules (optional)	Profibus DP, CANopen, EtherCAT
UL approval	yes

Dimensions with Brinkmann motor



Motor power kW	housing size	a mm	b mm	c mm	d mm	k mm
1.1	A	223	153	120	138	199
1.3 – 1.7	A	223	153	120	176	209
1.9 – 2.6	B	270	189	140	176	223
3.0 – 4.0	B	270	189	140	218	243
5.0 – 5.5	C	307	233	181	218	287
6.0 – 9.0	C	307	233	181	258	306
11.0 – 13.0	D	414	294	233	314	404

Models and Applications for High Pressure Screw Pumps



Models and Applications for High Pressure Screw Pumps with silicon carbide spindle housings

Screw spindle pumps with their silicon carbide spindle housing and highly wear resistant spindles are capable of achieving extremely high pressures.

Design -H: Pressure outlet is located above mounting plate; this provides convenient options for connection pipework.

Brinkmann high pressure screw pumps are designed for pumping filtered and lubricating fluids such as coolant oils and watersoluble coolants.

High pressure screw pumps are NOT designed for dry-running.

Applications

Types of fluid
oils, cooling/ cutting oils, coolants
Kinematic viscosity
1...45 mm²/s (45 cSt)
over 45 mm²/s on request
Pumping temperature
max. 60 °C * (* over 60 °C on request)
Recommended filtration levels
General Machining (Turning, milling, drilling) < 50 µm
Grinding and machining of aluminum (CBN etc.) < 20 µm
For additional information please refer to page 13.

Materials of construction

Pressure and Suction Housing Cast iron
Spindle Housing Silicon Carbide one-piece, highly wear resistant and precision machined.
Screw spindles Hardened tool steel, specially treated alloy; highly wear resistant and precision ground.
Seal Viton

Standard design	Model Index	Immersion Style						Inline Style for inline installation – horizontal or vertical with mechanical seal; positive suction pressure of up to 7 bar					
		BFS1	BFS2	TFS3	TFS4	TFS5	TFS6	FFS1	FFS2	FFS3	FFS4	FFS5	FFS6
Version													
Highly wear resistant SIC-bushing around labyrinth seal and coated driving male spindle	-KBT5	○	○	○	●	●	–	○	○	○	●	●	–
Highly wear resistant SIC-bushing around labyrinth seal, specially coated driving male spindle and outer female spindles	-KBT5N	○	○	○	○	○	●	○	○	○	○	○	●
Specially coated driving male spindle and outer female spindles	-T5N	○	○	○	–	–	–	○	○	○	–	–	–
Axial thrust compensation through radial slide bushing inside the suction cover	-A	○	○	●	●	●	●	○	○	●	●	●	●
Inline installation – vertical; Mechanical seal and internal leakage return; positive suction pressure of up to 7 bar	-G	○	○	○	○	○	●	●	●	●	●	●	●
Positive suction pressure of 7 – 20 bar (with leakage port, please see page 49)	-G4	○	○	○	○	–	–	○	○	○	○	–	–
Viscosity > 45 mm ² /s		○	○	○	○	○	○	○	○	○	○	○	○

Order code for Inline style for vertical installation (without footmount bracket):
BFS1...2 / Pressure-G, TFS3...6 / Pressure-G: e.g. TFS376/40-G

Order code for Inline style for horizontal or vertical installation (with footmount bracket):
FFS1...6 / Pressure: e.g. FFS260/40

With an operating pressures of 120 bar and higher the pumps are supplied in special -KBT5NA execution (P, P2).

-H design	Model Index	Immersion Style up to 120 bar		
		BFS1-H	BFS2-H	TFS3-H
Version				
Highly wear resistant SIC-bushing around labyrinth seal and coated driving male spindle	-KBT5	○	○	○
Highly wear resistant SIC-bushing around labyrinth seal, specially coated driving male spindle and outer female spindles	-KBT5N	○	○	○
Specially coated driving male spindle and outer female spindles	-T5N	○	○	○
Axial thrust compensation through radial slide bushing inside the suction cover	-A	□	□	□
Inline installation – vertical, Mechanical seal and internal leakage return; positive suction pressure of up to 7 bar	-G	□	□	□
Viscosity > 45 mm ² /s		○	○	○

○ available at extra charge ● standard □ upon request – not available

The power consumption of the pumps increases with higher discharge pressures. Depending on the actual installation conditions it is possible that pressures can occur which exceed the target design pressure. The motor must be sized in a way that the maximum pressure occurring in the application can be satisfied without overloading the motor. The listed pump / motor combination are for standard systems (pump + pressure relief valve).

In individual cases custom pump / motor combinations are feasible upon request.

Models and Applications for High Pressure Screw Pumps with cast iron spindle housing

Screw spindle pumps with cast iron spindle housings and highly wear resistant spindles can generate pressures of up to 60 bar.

Brinkmann high pressure screw pumps are designed for pumping filtered and lubricating fluids such as coolant oils and watersoluble coolants.

High pressure screw pumps are NOT designed for dry-running.

Applications

Types of fluid
oils, cooling/ cutting oils, coolants

Kinematic viscosity
1...45 mm²/s (45 cSt)
over 45 mm²/s on request

Pumping temperature
max. 60 °C * (* over 60 °C on request)

Recommended filtration levels
General Machining (Turning, milling, drilling) < 50 µm

Machining of materials of limited hardness (not for grinding applications).
For additional information please refer to page 13.

Materials of construction

Pressure and Suction Housing	Cast iron
Spindle Housing	Cast iron
Screw spindles	Hardened tool steel, specially treated alloy; highly wear resistant and precision ground.
Seal	Viton

Version	Model Index	Immersion Style		Inline Style for inline installation – horizontal or vertical with mechanical seal; positive suction pressure of up to 7 bar
		BFG2		FFG2
Inline installation – vertical Mechanical seal and internal leakage return; positive suction pressure of up to 7 bar	-G	○		●
Viscosity > 45 mm ² /s		○		○
4-pole motor	-4	○		○

○ available at extra charge ● Standard

Dimensional data for screw spindle pumps with cast iron spindle housings are identical to those with silicon carbide housings. The **flow rates** of screw spindle pumps equipped with cast iron housings are **up to 10% below** those flow rates of the screw spindle with silicon carbide housings which are shown on the following pages.

The maximum operating pressure is 60 bar.

High Pressure Pumps

BFS1, FFS1

50 Hz

Screw spindles

Pressure max.	2-pole motor rotation speed 2900 RPM							4-pole motor rotation speed 1450 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor immersion version	Motor foot mounted version	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s				1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
BFS130/	Q_{Th}¹⁾ 15.6		-	-	-	-	-	Q_{Th}¹⁾ 7.8		-	-	-	-
10	14	15	0.5	0.5	B 1.3	0.75	39	6.2	7.2	0.2	0.2	0.75	30
20	13.1	14.6	0.8	0.8	B 1.3	1.1	39	5.3	6.8	0.4	0.4	0.75	30
30	12.1	14.2	1.0	1.0	B 1.3	1.5	39	4.3	6.4	0.5	0.5	0.75	30
40	11.2	13.9	1.3	1.3	B 1.5	1.5	39	3.4	6.1	0.6	0.7	1.1	32
50	10.3	13.5	1.5	1.6	B 1.7	2.2	40	-	5.7	-	0.8	1.1	32
60	9.5	13.2	1.8	1.9	B 2.2	2.2	44	-	5.4	-	0.9	1.1	32
70	8.7	12.8	2.1	2.1	B 2.6	3.0	45	-	5	-	1.1	1.5	34
80	7.9	12.5	2.3	2.4	B 2.6	3.0	45	-	4.7	-	1.2	1.5	34
90	7.1	12.1	2.6	2.7	B 3.3	3.0	57	-	4.3	-	1.3	1.5	34
100	6.4	11.8	2.8	2.9	B 3.3	4.0	57	-	4	-	1.5	2.2	45
110	5.7	11.5	3.1	3.2	B 3.3	4.0	57	-	-	-	-	-	-
120	5	11.2	3.4	3.5	B 4.0	4.0	58	-	-	-	-	-	-
130	-	10.9	-	3.8	B 4.0	4.0	58	-	-	-	-	-	-
140	-	10.6	-	4.0	B 5.0	5.5	63	-	-	-	-	-	-
150	-	10.3	-	4.3	B 5.0	5.5	63	-	-	-	-	-	-
BFS140/	Q_{Th}¹⁾ 20.9		-	-	-	-	-	Q_{Th}¹⁾ 10.5		-	-	-	-
10	18.8	20.1	0.6	0.7	B 1.3	1.1	39	8.4	9.6	0.3	0.3	0.75	30
20	17.5	19.5	0.9	1.0	B 1.3	1.5	39	7.1	9.1	0.4	0.5	0.75	30
30	16.3	19	1.3	1.4	B 1.5	1.5	39	5.8	8.6	0.6	0.7	1.1	32
40	15.1	18.5	1.6	1.7	B 1.9	2.2	44	4.7	8.1	0.8	0.9	1.1	32
50	14	18	2.0	2.1	B 2.2	3.0	44	3.6	7.6	1.0	1.1	1.5	34
60	13	17.6	2.3	2.5	B 2.6	3.0	45	2.6	7.1	1.1	1.3	1.5	34
70	12	17.1	2.7	2.8	B 3.3	3.0	57	-	6.6	-	1.4	2.2	45
80	11.1	16.6	3.0	3.2	B 3.3	4.0	57	-	6.2	-	1.6	2.2	45
90	10.3	16.2	3.4	3.5	B 4.0	4.0	58	-	5.7	-	1.8	2.2	45
100	9.5	15.7	3.7	3.9	B 4.0	5.5	60	-	5.3	-	2.0	2.2	45
110	8.3	15.3	4.1	4.3	B 5.0	5.5	63	-	-	-	-	-	-
120	7.3	14.8	4.4	4.6	B 5.0	5.5	63	-	-	-	-	-	-
130	6.3	14.4	4.8	5.0	B 5.5	5.5	63	-	-	-	-	-	-
140	-	14	-	5.3	B 5.5	5.5	63	-	-	-	-	-	-
150	-	13.6	-	5.7	B 7.5	7.5	94	-	-	-	-	-	-

¹⁾ Q_{Th}: Theoretical flow rate

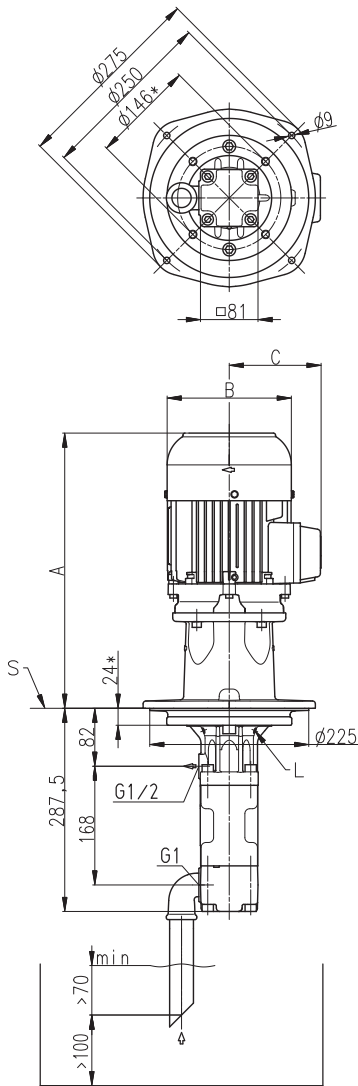
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

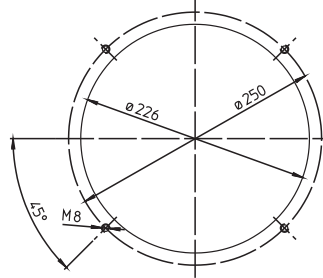
BFS1, FFS1

50 Hz

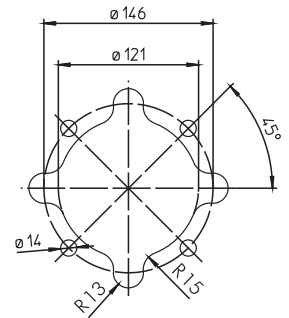


Mounting hole patterns

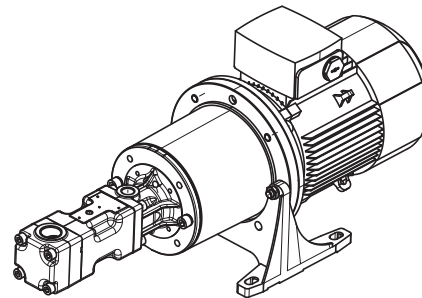
BFS1 / BFS2



TFS1 / TFS2



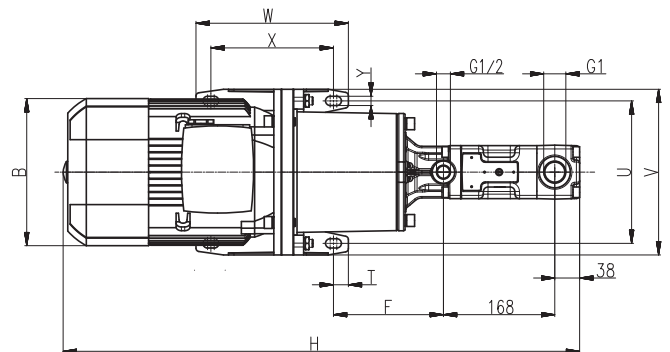
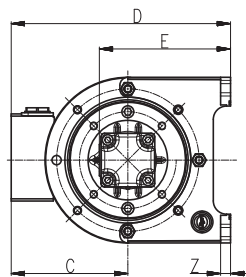
All corners must be deburred!
According to ISO 2768-m



*) Dimensions for 4-pole standard motor upon request

L = Leakage hole

S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	A mm	B mm	C mm
B 1.3 / 1.5	415	176	130
B 1.7	441	176	130
B 1.9 / 2.2 / 2.6	474	176	130
B 3.3 / 4.0	513	218	150
B 5.0 / 5.5	543	218	150
B 7.5	622	258	193

Power 2-poles kW	Power 4-poles kW	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
0.75	-	159	121	233	155	138	676	15	180	210	90	60	11	12
-	0.75	159	121	233	155	138	751	15	180	210	90	60	11	12
1.1	-	159	121	233	155	138	711	15	180	210	90	60	11	12
1.5	1.1 / 1.5	178	126	238	155	138	721	15	180	210	90	60	11	12
2.2	-	178	126	238	155	138	761	15	180	210	90	60	11	12
3.0	2.2	198	166	321	198	166	821	22.5	215	250	230	185	14	15
4.0	-	222	177	332	198	166	805	22.5	215	250	230	185	14	15
5.5	-	262	202	387	228	171	857	22.5	265	300	270	225	14	18
7.5	-	262	202	387	228	171	907	22.5	265	300	270	225	14	18

High Pressure Pumps

BFS2, FFS2

50 Hz

Screw spindles

Pressure max.	2-pole motor rotation speed 2900 RPM							4-pole motor rotation speed 1450 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor immersion version	Motor foot mounted version	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s				1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
BFS232/	Q_{Th}¹⁾ 26.1		–	–	–	–	–	Q_{Th}¹⁾ 13.1		–	–	–	–
10	24.3	25.4	0.7	0.8	B 1.3	1.1	40	11.2	12.4	0.3	0.5	0.75	31
20	23.6	25.2	1.1	1.3	B 1.5	1.5	40	10.6	12.1	0.6	0.7	1.1	33
30	23	24.9	1.5	1.7	B 1.9	2.2	45	10	11.9	0.8	0.9	1.1	33
40	22.4	24.6	2.0	2.2	B 2.6	3.0	46	9.4	11.6	1.0	1.2	1.5	35
50	21.8	24.4	2.4	2.7	B 3.3	3.0	58	8.8	11.3	1.2	1.4	2.2	46
60	21.2	24.1	2.8	3.1	B 3.3	4.0	58	8.2	11.1	1.4	1.6	2.2	46
70	20.6	23.9	3.3	3.6	B 4.0	4.0	59	7.6	10.8	1.7	1.9	2.2	46
80	20	23.6	3.7	4.0	B 5.0	5.5	64	7	10.6	1.9	2.1	3.0	46
90	19.5	23.3	4.1	4.5	B 5.0	5.5	64	6.4	10.3	2.1	2.3	3.0	46
100	18.9	23.1	4.6	4.9	B 5.5	5.5	64	5.8	10	2.3	2.5	3.0	46
110	18.4	22.9	5.0	5.4	B 5.5	7.5	75	–	–	–	–	–	–
120	17.8	22.6	5.5	5.8	B 7.5	7.5	94	–	–	–	–	–	–
130	17.3	22.4	5.9	6.3	B 7.5	7.5	94	–	–	–	–	–	–
140	16.7	22.1	6.3	6.7	B 7.5	7.5	94	–	–	–	–	–	–
150	16.2	21.9	6.8	7.2	B 7.5	7.5	94	–	–	–	–	–	–
BFS238/	Q_{Th}¹⁾ 31		–	–	–	–	–	Q_{Th}¹⁾ 15.5		–	–	–	–
10	28.8	30.1	0.7	0.7	B 1.3	1.1	40	13.3	14.6	0.4	0.4	0.75	31
20	28.1	29.8	1.3	1.3	B 1.5	1.5	40	12.6	14.3	0.6	0.6	1.1	33
30	27.4	29.5	1.8	1.8	B 2.2	2.2	45	11.9	14	0.9	0.9	1.1	33
40	26.7	29.2	2.3	2.4	B 2.6	3.0	46	11.2	13.7	1.2	1.2	1.5	35
50	26	28.9	2.8	2.9	B 3.3	4.0	58	10.5	13.4	1.4	1.5	2.2	46
60	25.3	28.7	3.3	3.5	B 4.0	4.0	59	9.8	13.2	1.7	1.8	2.2	46
70	24.6	28.4	3.8	4.0	B 5.0	5.5	64	9.1	12.9	1.9	2.0	2.2	46
80	23.9	28.1	4.4	4.5	B 5.0	5.5	64	8.4	12.6	2.2	2.3	3.0	46
90	23.2	27.8	4.9	5.1	B 5.5	5.5	64	7.7	12.3	2.5	2.6	3.0	46
100	22.5	27.6	5.4	5.6	B 7.5	7.5	94	7	12.1	2.7	2.9	4.0	50
110	21.9	27.3	5.9	6.2	B 7.5	7.5	94	–	–	–	–	–	–
120	21.2	27	6.4	6.8	B 7.5	7.5	94	–	–	–	–	–	–
130	20.6	26.7	6.9	7.3	B 9.0	11.0	100	–	–	–	–	–	–
140	19.9	26.5	7.5	7.9	B 9.0	11.0	100	–	–	–	–	–	–
150	19.3	26.2	8.0	8.4	B 9.0	11.0	100	–	–	–	–	–	–

¹⁾ Q_{Th}: Theoretical flow rate

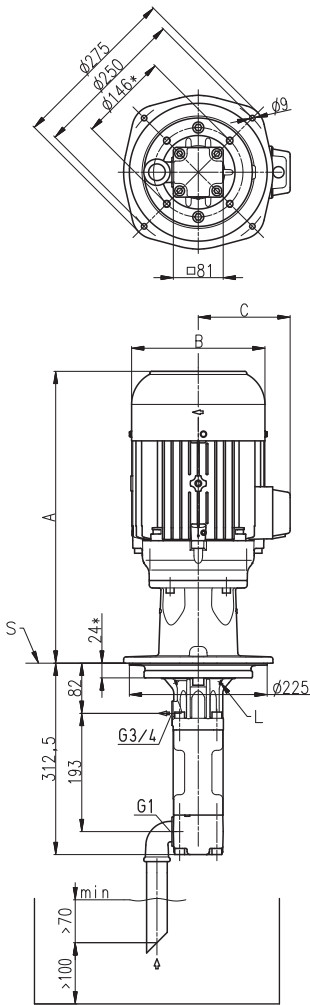
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

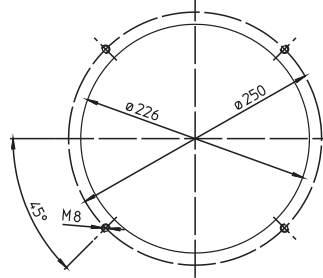
BFS2, FFS2

50 Hz

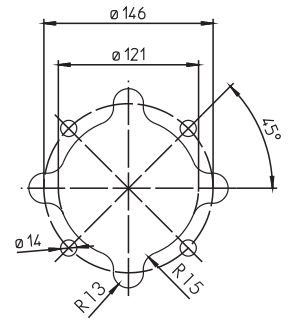


Mounting hole patterns

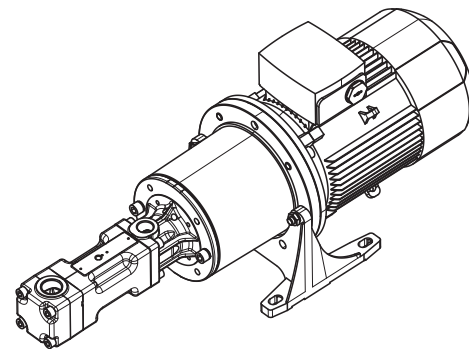
BFS1 / BFS2



TFS1 / TFS2

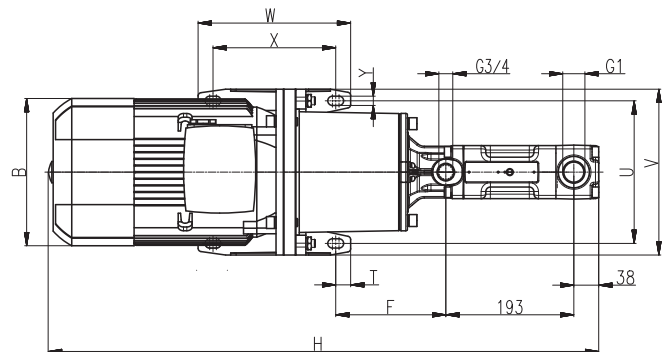
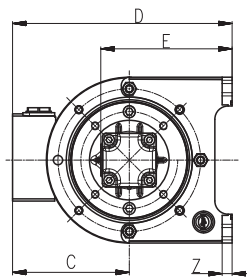


All corners must be deburred!
According to ISO 2768-m



*) Dimensions for 4-pole standard motor upon request
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole

Power 2-poles kW	A mm	B mm	C mm
B 1.3 / 1.5	415	176	130
B 1.9 / 2.2 / 2.6	474	176	130
B 3.3 / 4.0	513	218	150
B 5.0 / 5.5	543	218	150
B 7.5 / 9.0	622	258	193



Power 2-poles kW	Power 4-poles kW	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	0.75	159	121	233	155	138	776	15	180	210	90	60	11	12
1.1	-	159	121	233	155	138	736	15	180	210	90	60	11	12
1.5	1.1 / 1.5	178	126	238	155	138	746	15	180	210	90	60	11	12
2.2	-	178	126	238	155	138	786	15	180	210	90	60	11	12
3.0	2.2 / 3.0	198	166	321	198	166	846	22.5	215	250	230	185	14	15
4.0	4.0	222	177	332	198	166	830	22.5	215	250	230	185	14	15
5.5	-	262	202	387	228	171	882	22.5	265	300	270	225	14	18
7.5	-	262	202	387	228	171	932	22.5	265	300	270	225	14	18
11.0	-	314	237	472	278	210	1051	20	300	350	305	265	18	18

High Pressure Pumps

BFS2, FFS2

50 Hz

Screw spindles

Pressure max.	2-pole motor rotation speed 2900 RPM							4-pole motor rotation speed 1450 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor immersion version	Motor foot mounted version	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s				1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
BFS250/	Q_{Th}¹⁾ 40.8		–	–	–	–	–	Q_{Th}¹⁾ 20.4		–	–	–	–
10	37.9	39.6	0.9	0.9	B 1.3	1.5	40	17.5	19.2	0.5	0.5	0.75	31
20	37	39.2	1.6	1.6	B 1.9	2.2	45	16.6	18.8	0.8	0.8	1.1	33
30	36	38.9	2.3	2.3	B 2.6	3.0	46	15.6	18.5	1.2	1.2	1.5	35
40	35.1	38.5	3.0	3.1	B 3.3	4.0	58	14.7	18.1	1.5	1.6	2.2	46
50	34.3	38.1	3.6	3.8	B 4.0	4.0	59	13.9	17.7	1.8	1.9	2.2	46
60	33.5	37.7	4.3	4.5	B 5.0	5.5	64	13.1	17.3	2.2	2.3	3.0	46
70	32.7	37.4	5.0	5.2	B 5.5	5.5	64	12.3	17	2.5	2.6	3.0	46
80	31.9	37	5.7	5.9	B 7.5	7.5	94	11.5	16.6	2.9	3.0	4.0	50
90	31.2	36.6	6.4	6.6	B 7.5	7.5	94	10.7	16.2	3.2	3.3	4.0	50
100	30.5	36.2	7.0	7.4	B 9.0	11.0	100	9.9	15.8	3.5	3.7	4.0	50
110	29.2	35.9	7.7	8.1	B 9.0	11.0	100	–	–	–	–	–	–
120	27.9	35.5	8.4	8.8	B 11.0	11.0	122	–	–	–	–	–	–
130	26.6	35.1	9.1	9.5	B 11.0	11.0	122	–	–	–	–	–	–
140	25.4	34.7	9.8	10.2	B 11.0	11.0	122	–	–	–	–	–	–
150	24.1	34.3	10.4	11.0	B 13.0	15.0	122	–	–	–	–	–	–
BFS260/	Q_{Th}¹⁾ 48.9		–	–	–	–	–	Q_{Th}¹⁾ 24.5		–	–	–	–
10	45.5	47.4	1.0	1.1	B 1.7	2.2	41	21	23	0.5	0.6	0.75	31
20	44.3	46.9	1.9	2.0	B 2.6	3.0	46	19.9	22.4	0.9	1.0	1.5	35
30	43.2	46.3	2.7	2.9	B 3.3	4.0	58	18.7	21.8	1.4	1.4	2.2	46
40	42	45.7	3.5	3.8	B 5.0	5.5	64	17.6	21.2	1.8	1.9	2.2	46
50	40.9	45.1	4.3	4.6	B 5.0	5.5	64	16.4	20.7	2.2	2.3	3.0	46
60	39.7	44.5	5.1	5.5	B 7.5	7.5	94	15.3	20	2.6	2.8	3.0	46
70	38.5	43.9	5.9	6.4	B 7.5	7.5	94	14.1	19.4	3.0	3.2	4.0	50
80	37.4	43.3	6.8	7.3	B 9.0	11.0	100	12.9	18.8	3.4	3.7	4.0	50
90	36.2	42.6	7.6	8.1	B 9.0	11.0	100	11.8	18.2	3.8	4.1	5.5	82
100	35	42	8.5	9.0	B 11.0	11.0	122	10.6	17.6	4.3	4.5	5.5	82
110	33.4	41.4	9.3	9.9	B 11.0	11.0	122	–	–	–	–	–	–
120	31.8	40.7	10.0	10.8	B 11.0	11.0	122	–	–	–	–	–	–
130	30.1	39.5	10.9	11.7	B 13.0	15.0	122	–	–	–	–	–	–
140	28.5	38.2	11.7	12.5	B 13.0	15.0	122	–	–	–	–	–	–
150	26.9	37	12.5	13.4	–	15.0	103	–	–	–	–	–	–

¹⁾ Q_{Th}: Theoretical flow rate

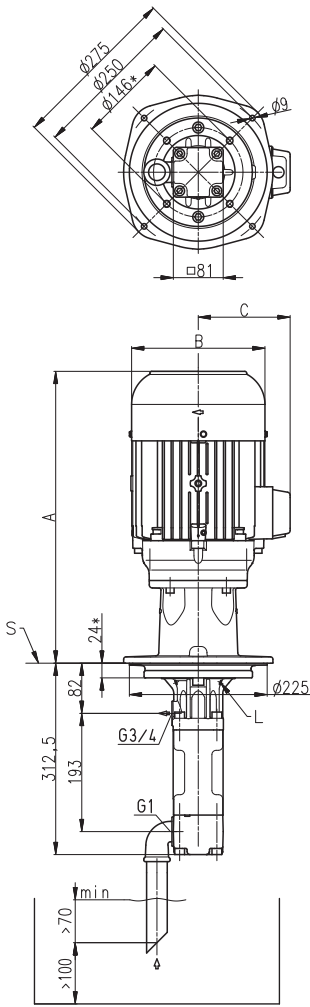
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

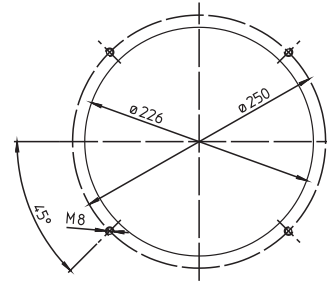
BFS2, FFS2

50 Hz

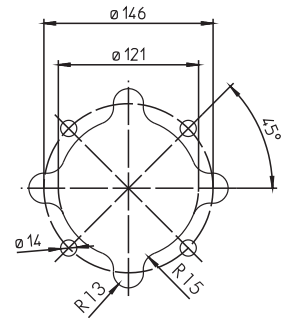


Mounting hole patterns

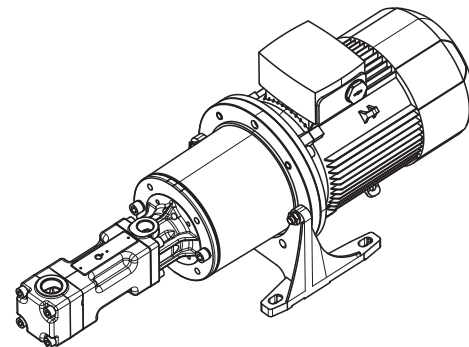
BFS1 / BFS2



TFS1 / TFS2

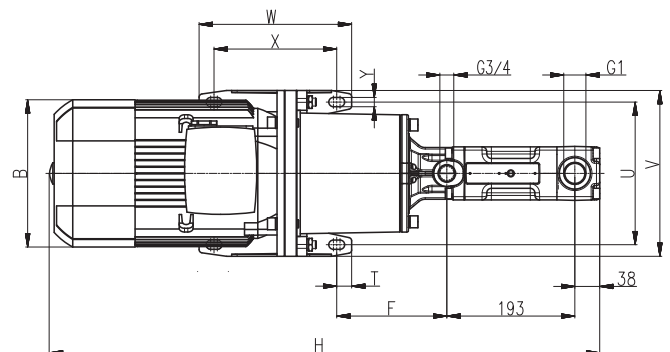
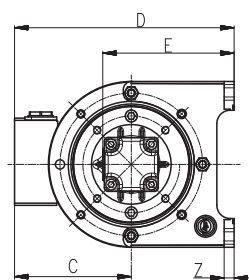


All corners must be deburred!
According to ISO 2768-m



*) Dimensions for 4-pole standard motor upon request
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole

Power 2-poles kW	A mm	B mm	C mm
B 1.3	415	176	130
B 1.7	441	176	130
B 1.9 / 2.6	474	176	130
B 3.3 / 4.0	513	218	150
B 5.0 / 5.5	543	218	150
B 7.5 / 9.0	622	258	193
B 11.0 / 13.0	630	310	240



Power 2-poles kW	Power 4-poles kW	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	0.75	159	121	233	155	138	776	15	180	210	90	60	11	12
1.5	1.1 / 1.5	178	126	238	155	138	746	15	180	210	90	60	11	12
2.2	-	178	126	238	155	138	786	15	180	210	90	60	11	12
3.0	2.2 / 3.0	198	166	321	198	166	846	22.5	215	250	230	185	14	15
4.0	4.0	222	177	332	198	166	830	22.5	215	250	230	185	14	15
5.5	-	262	202	387	228	171	882	22.5	265	300	270	225	14	18
7.5	5.5	262	202	387	228	171	932	22.5	265	300	270	225	14	18
11.0 / 15.0	-	314	237	472	278	210	1051	20	300	350	305	265	18	18

TFS3, FFS3

50 Hz

Screw spindles

2-pole motor rotation speed 2900 RPM							4-pole motor rotation speed 1450 RPM					
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s			1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
TFS348/	Q_{Th}¹⁾ 64.1		-	-	-	-	Q_{Th}¹⁾ 32.1		-	-	-	-
10	60	62.3	1.5	1.6	2.2	47	28	30.3	0.7	0.8	1.1	44
20	58.5	61.5	2.5	2.8	4.0	62	26.5	29.4	1.2	1.3	1.5	47
30	57.1	60.7	3.6	3.9	5.5	72	25	28.6	1.8	1.9	2.2	58
40	55.7	59.9	4.7	5.1	5.5	72	23.6	27.9	2.3	2.4	3.0	58
50	54.4	59.2	5.7	6.2	7.5	86	22.3	27.1	2.8	3.0	4.0	62
60	53.1	58.5	6.8	7.3	11.0	105	21.1	26.5	3.4	3.5	4.0	62
70	51.9	57.9	7.9	8.5	11.0	105	19.8	25.8	3.9	4.1	5.5	93
80	50.7	57.3	8.9	9.6	11.0	105	18.7	25.2	4.4	4.7	5.5	93
90	49.6	56.7	10.0	10.7	15.0	114	17.4	24.6	5.0	5.2	5.5	93
100	48.6	56.1	11.1	11.8	15.0	114	16.2	24.1	5.5	5.8	7.5	93
110	46.7	55.6	12.1	13.0	15.0	114	-	-	-	-	-	-
120	45	55.2	13.2	14.2	15.0	114	-	-	-	-	-	-
130	43.3	54.7	14.3	15.3	18.5	124	-	-	-	-	-	-
140	41.6	54.4	15.3	16.4	18.5	124	-	-	-	-	-	-
150	40	54	16.4	17.6	18.5	124	-	-	-	-	-	-
TFS364/	Q_{Th}¹⁾ 85.5		-	-	-	-	Q_{Th}¹⁾ 42.8		-	-	-	-
10	79.9	83	1.8	2.0	3.0	54	37.1	40.3	0.9	0.9	1.5	47
20	78.1	82	3.3	3.5	5.5	72	35.3	39.2	1.6	1.7	2.2	58
30	76.3	81	4.7	5.0	7.5	86	33.6	38.3	2.3	2.4	3.0	58
40	74.6	80.1	6.1	6.5	7.5	86	31.9	37.4	3.0	3.2	4.0	62
50	73	79.2	7.5	8.0	11.0	105	30.2	36.5	3.7	3.9	5.5	93
60	71.4	78.4	9.0	9.5	11.0	105	28.7	35.7	4.4	4.7	5.5	93
70	69.9	77.6	10.4	10.9	15.0	114	27.1	34.9	5.1	5.4	7.5	93
80	68.4	76.9	11.8	12.4	15.0	114	25.6	34.1	5.9	6.1	7.5	93
90	66.9	76.1	13.2	13.9	15.0	114	24	33.4	6.6	6.9	7.5	93
100	65.5	75.5	14.7	15.4	18.5	124	22.4	32.7	7.3	7.6	11.0	113
110	63.2	74.8	16.1	16.9	18.5	124	-	-	-	-	-	-
120	61	74.3	17.5	18.4	22.0	135	-	-	-	-	-	-
130	58.8	72.7	18.9	19.9	22.0	135	-	-	-	-	-	-
140	56.6	71.3	20.4	21.4	22.0	135	-	-	-	-	-	-
150	54.5	69.8	21.8	22.8	30.0	259	-	-	-	-	-	-
TFS376/	Q_{Th}¹⁾ 101.5		-	-	-	-	Q_{Th}¹⁾ 50.8		-	-	-	-
10	95.2	98.5	2.1	2.4	4.0	62	44.5	47.8	1.0	1.2	2.2	58
20	93.1	97.3	3.8	4.2	5.5	72	42.3	46.6	1.8	2.1	3.0	58
30	91	96.2	5.5	6.0	7.5	86	40.3	45.4	2.7	3.0	4.0	62
40	89	95.1	7.2	7.9	11.0	105	38.2	44.4	3.5	3.9	5.5	93
50	87	94.1	8.9	9.7	11.0	105	36.2	43.3	4.4	4.8	5.5	93
60	85	93.1	10.6	11.5	15.0	114	34.3	42.4	5.2	5.7	7.5	93
70	83.1	92.2	12.2	13.3	15.0	114	32.3	41.4	6.1	6.6	7.5	93
80	81.2	91.3	13.9	15.1	18.5	124	30.4	40.5	6.9	7.4	11.0	113
90	79.3	90.4	15.6	16.9	18.5	124	28.4	39.7	7.8	8.4	11.0	113
100	77.5	89.6	17.3	18.8	22.0	135	26.5	38.9	8.6	9.2	11.0	113
110	74.5	88.9	19.0	20.6	22.0	135	-	-	-	-	-	-
120	71.6	88.2	20.7	22.4	30.0	259	-	-	-	-	-	-
130	68.8	86.4	22.4	24.2	30.0	259	-	-	-	-	-	-
140	66	84.7	24.0	26.0	30.0	259	-	-	-	-	-	-
150	63.2	83	25.7	27.9	30.0	259	-	-	-	-	-	-

¹⁾ Q_{Th}: Theoretical flow rate

Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

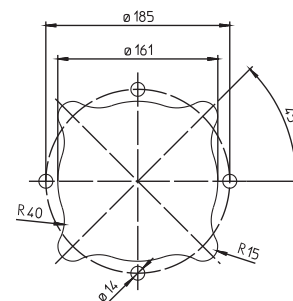
Characteristics and dimensions

TFS3, FFS3

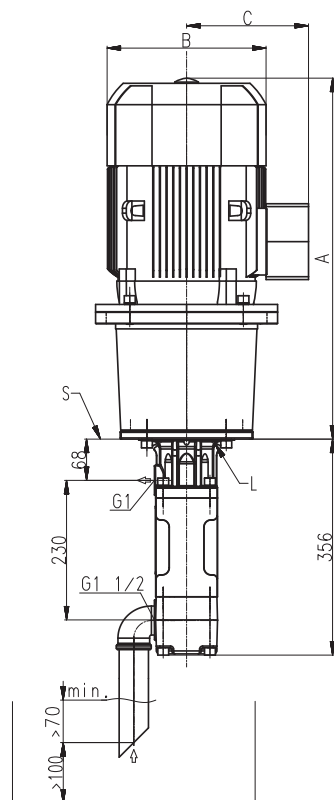
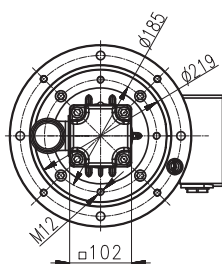
50 Hz

Mounting hole patterns

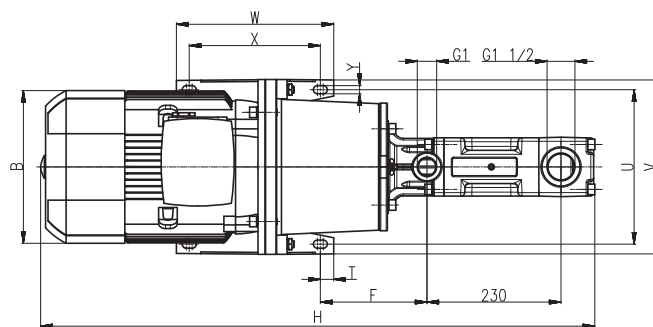
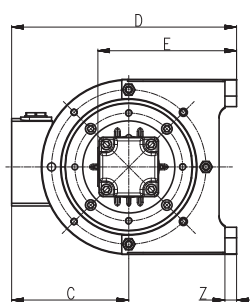
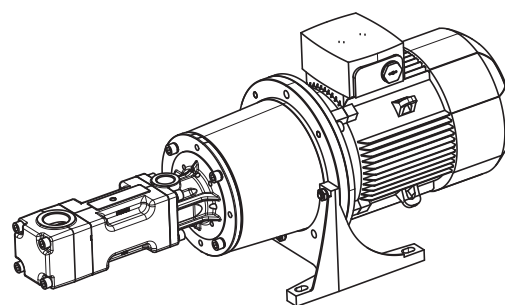
TFS3 / TFS4



All corners must be deburred!
According to ISO 2768-m



L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	Power 4-poles kW	A mm	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
–	1.1 / 1.5	476	178	126	238	165	167	847	15	180	210	90	60	11	12
2.2	–	516	178	126	238	165	167	887	15	180	210	90	60	11	12
3.0	2.2 / 3.0	568	198	166	321	208	186	924	22.5	215	250	230	185	14	15
4.0	4.0	551	222	177	332	208	186	907	22.5	215	250	230	185	14	15
5.5	–	595	262	202	387	238	183	951	22.5	265	300	270	225	14	18
7.5	5.5	645	262	202	387	238	183	1001	22.5	265	300	270	225	14	18
–	7.5	654	262	202	387	238	183	1010	22.5	265	300	270	225	14	18
11.0 / 15.0	11.0	764	314	237	472	288	222	1120	20	300	350	305	265	18	18
18.5	–	824	314	237	472	288	222	1180	20	300	350	305	265	18	18
22.0	–	824	356	286	521	288	222	1180	20	300	350	305	265	18	18
30.0	–	881	396	315	575	313	212	1237	25	350	400	300	18	18	20

Pressure max.	2-pole motor rotation speed 2900 RPM						4-pole motor rotation speed 1450 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s			1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
TFS460/	Q_{Th}¹⁾ 125.3		–	–	–	–	Q_{Th}¹⁾ 62.7		–	–	–	–
10	118	122	2.7	3.0	4.0	72	55	59	1.2	1.3	2.2	68
20	115	120	4.8	5.2	7.5	96	52	57	2.3	2.4	3.0	68
30	112	118	6.9	7.4	11.0	115	50	56	3.3	3.5	4.0	72
40	110	117	9.0	9.6	11.0	115	47	54	4.4	4.7	5.5	103
50	107	116	11.0	11.8	15.0	124	44	53	5.4	5.8	7.5	103
60	105	114	13.1	14.0	15.0	124	42	52	6.5	6.9	7.5	103
70	102	113	15.2	16.1	18.5	134	40	50	7.5	8.0	11.0	123
80	100	112	17.3	18.3	22.0	145	37	49	8.6	9.1	11.0	123
90	98	111	19.4	20.5	22.0	145	35	48	9.6	10.3	11.0	123
100	96	110	21.5	22.7	30.0	269	32	47	10.7	11.3	15.0	140
110	94	109	23.6	24.9	30.0	269	–	–	–	–	–	–
120	91	108	25.6	27.1	30.0	269	–	–	–	–	–	–
TFS480/	Q_{Th}¹⁾ 167.1		–	–	–	–	Q_{Th}¹⁾ 83.6		–	–	–	–
10	157	162	3.4	3.7	5.5	82	74	79	1.6	1.8	2.2	68
20	153	160	6.2	6.6	7.5	96	70	76	3.0	3.2	4.0	72
30	150	158	9.0	9.5	11.0	115	66	74	4.4	4.7	5.5	103
40	146	156	11.7	12.4	15.0	124	63	72	5.8	6.1	7.5	103
50	143	154	14.5	15.2	18.5	134	60	70	7.2	7.6	11.0	123
60	140	152	17.3	18.1	22.0	145	56	68	8.6	9.2	11.0	123
70	137	150	20.1	21.0	22.0	145	53	67	9.9	10.6	11.0	123
80	134	149	22.9	23.9	30.0	269	51	65	11.3	12.1	15.0	140
90	132	147	25.7	26.7	30.0	269	47	64	12.7	13.6	15.0	140
100	129	146	28.5	29.6	30.0	269	44	63	14.1	15.0	18.5	205
110	126	145	31.3	32.5	37.0	294	–	–	–	–	–	–
120	124	144	34.0	35.4	37.0	294	–	–	–	–	–	–
TFS496/	Q_{Th}¹⁾ 200.5		–	–	–	–	Q_{Th}¹⁾ 100.3		–	–	–	–
10	189	194	3.9	4.4	5.5	82	89	94	1.9	2.1	3.0	68
20	185	192	7.3	8.0	11.0	115	85	92	3.5	3.9	5.5	103
30	181	190	10.6	11.5	15.0	124	80	90	5.2	5.7	7.5	103
40	177	188	14.0	15.1	18.5	134	76	88	6.9	7.5	11.0	123
50	173	186	17.3	18.6	22.0	145	72	86	8.6	9.3	11.0	123
60	169	184	20.7	22.2	30.0	269	69	84	10.2	11.1	15.0	140
70	166	182	24.0	25.7	30.0	269	65	82	11.9	12.9	15.0	140
80	162	180	27.3	29.3	37.0	294	62	80	13.6	14.8	18.5	205
90	159	179	30.7	32.8	37.0	294	58	78	15.3	16.6	18.5	205
100	156	177	34.0	36.4	45.0	358	55	77	16.9	18.4	22.0	210
110	153	176	37.4	39.9	45.0	358	–	–	–	–	–	–
120	149	174	40.7	43.5	45.0	358	–	–	–	–	–	–

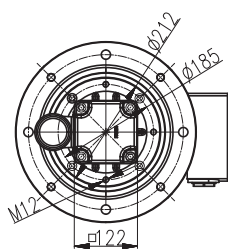
¹⁾ Q_{Th}: Theoretical flow rate

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

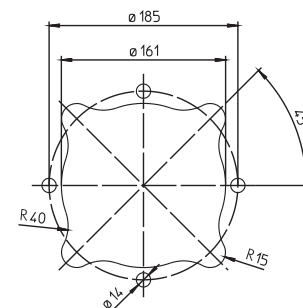
TFS4, FFS4

50 Hz

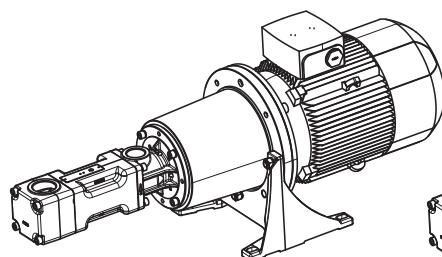
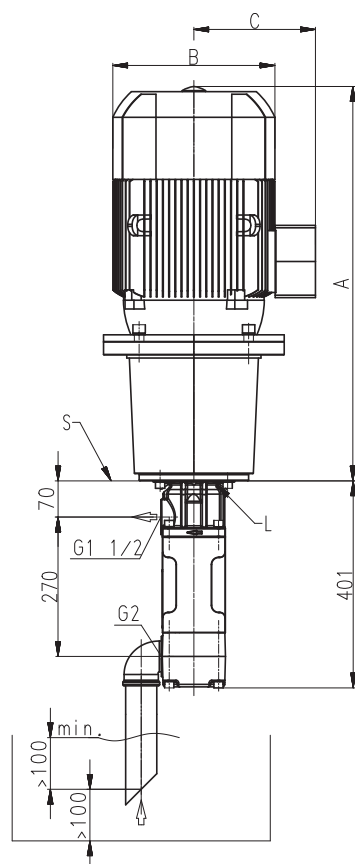


Mounting hole patterns

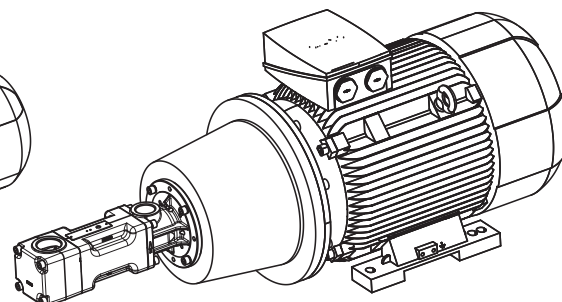
TFS3 / TFS4



All corners must be deburred!
According to ISO 2768-m

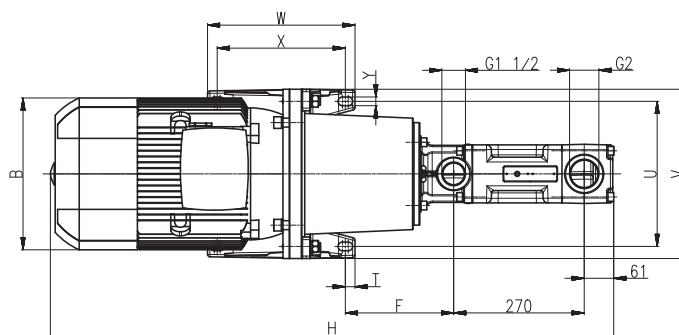
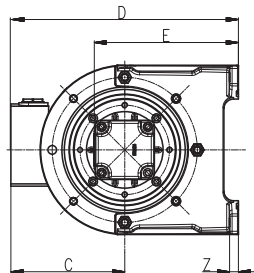


<math>< 45kW</math>



$\ge 45kW$

L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	Power 4-poles kW	A mm	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	2.2 / 3.0	568	198	166	321	218	188	969	22.5	215	250	230	185	14	15
4.0	4.0	551	222	177	332	218	188	952	22.5	215	250	230	185	14	15
7.5	5.5	659	262	202	387	248	199	1060	22.5	265	300	270	225	14	18
5.5	-	609	262	202	387	248	199	1010	22.5	265	300	270	225	14	18
-	7.5	668	262	202	387	248	199	1069	22.5	265	300	270	225	14	18
11.0 / 15.0	11.0	764	314	237	472	298	224	1165	20	300	350	305	265	18	18
18.5	15.0	824	314	237	472	298	224	1225	20	300	350	305	265	18	18
-	18.5	828	356	286	521	298	224	1229	20	300	350	305	265	18	18
22.0	-	824	356	286	521	298	224	1225	20	300	350	305	265	18	18
-	22.0	858	356	286	521	298	224	1259	20	300	350	305	265	18	18
30.0	-	881	396	315	575	323	214	1282	25	350	400	350	300	18	20
37.0	-	906	396	315	575	323	214	1307	25	350	400	350	300	18	20
45.0	-	984	449	338	563	288	495	1385	25	356	436	361	311	19	34

Pressure max.	2-pole motor rotation speed 2900 RPM						4-pole motor rotation speed 1450 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s			1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
TFS574/	Q_{Th}¹⁾ 241.6		–	–	–	–	Q_{Th}¹⁾ 120.8		–	–	–	–
10	230	235	5.0	5.7	7.5	123	109	114	2.3	2.7	4.0	99
20	226	233	9.1	9.9	15.0	151	105	112	4.3	4.8	5.5	130
30	222	231	13.1	14.2	18.5	161	101	110	6.3	7.0	7.5	130
40	219	229	17.1	18.4	22.0	172	98	109	8.4	9.1	11.0	150
50	216	228	21.1	22.6	30.0	295	95	107	10.4	11.3	15.0	167
60	213	226	25.2	26.9	30.0	295	92	105	12.4	13.4	15.0	167
70	210	224	29.2	31.1	37.0	320	89	104	14.4	15.5	18.5	232
80	207	223	33.2	35.4	37.0	320	86	102	16.4	17.7	18.5	232
90	204	221	37.2	39.6	45.0	385	83	101	18.4	19.8	22.0	237
100	202	220	41.3	43.8	45.0	385	80	99	20.5	21.9	30.0	310
110	199	219	45.3	48.1	55.0	460	–	–	–	–	–	–
120	196	217	49.3	52.3	55.0	460	–	–	–	–	–	–
TFS5100/	Q_{Th}¹⁾ 326.5		–	–	–	–	Q_{Th}¹⁾ 163.3		–	–	–	–
10	310	318	6.4	7.1	11.0	142	147	155	3.0	3.5	5.5	130
20	306	316	11.9	12.9	15.0	151	143	152	5.7	6.4	7.5	130
30	302	313	17.3	18.6	22.0	172	139	150	8.5	9.3	11.0	150
40	298	311	22.8	24.4	30.0	295	135	148	11.2	12.2	15.0	167
50	294	309	28.2	30.2	37.0	320	131	146	13.9	15.1	18.5	232
60	291	307	33.7	36.0	45.0	385	127	144	16.6	18.0	18.5	232
70	287	305	39.1	41.7	45.0	385	124	142	19.3	20.9	22.0	237
80	284	303	44.5	47.5	55.0	460	120	140	22.1	23.9	30.0	310
90	280	302	50.0	53.3	55.0	460	116	138	24.8	26.8	30.0	310
100	277	300	55.4	59.1	75.0	585	113	137	27.5	29.7	37.0	355
110	273	299	60.9	64.8	75.0	585	–	–	–	–	–	–
120	270	297	66.3	70.6	75.0	585	–	–	–	–	–	–

¹⁾ Q_{Th}: Theoretical flow rate

Viscosity > 20 mm²/s more power consumption.

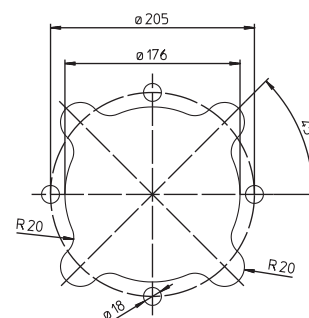
Characteristics and dimensions

TFS5, FFS5

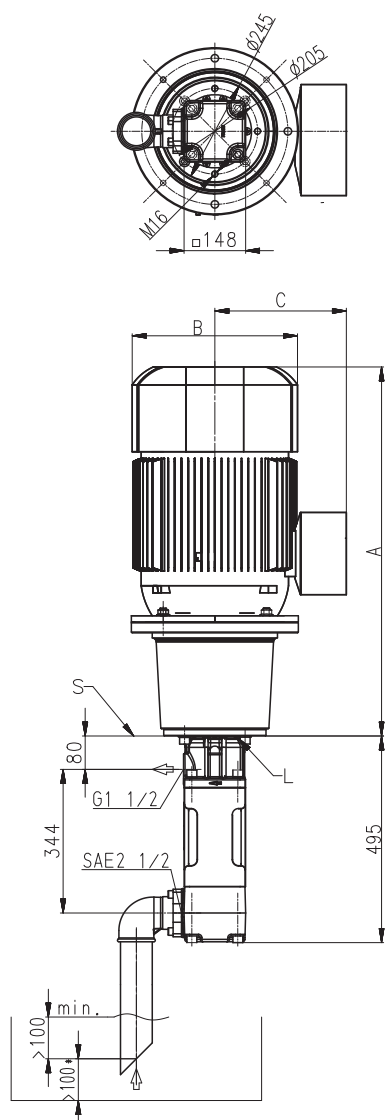
50 Hz

Mounting hole patterns

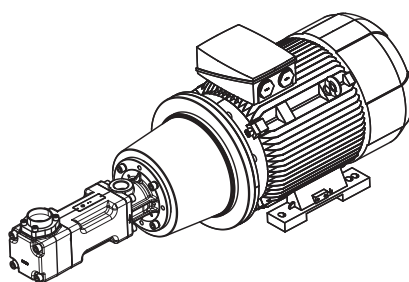
TFS5



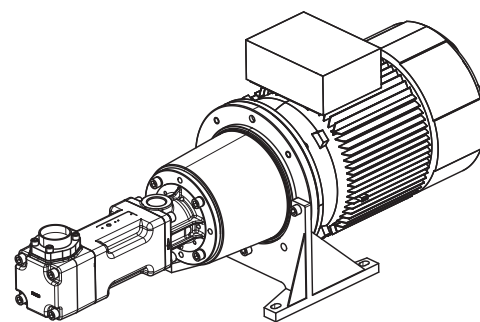
All corners must be deburred
According to
ISO 2768-m



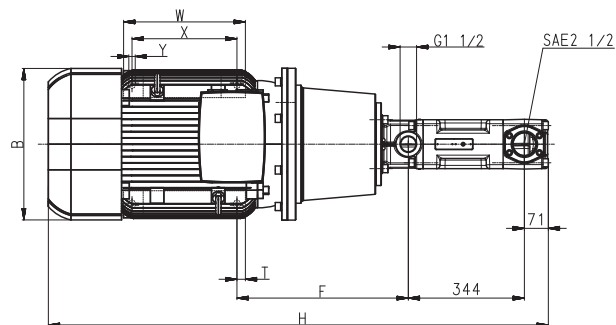
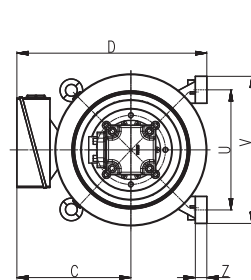
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



< 45kW



≥ 45kW



Power 2-poles kW	Power 4-poles kW	A mm	B mm	C mm	D mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	4.0	581	222	177	332	228	1076	22.5	215	250	230	185	14	15
7.5	5.5	672	262	202	387	222	1167	22.5	265	300	270	225	14	18
-	7.5	681	262	202	387	222	1176	22.5	265	300	270	225	14	18
11.0 / 15.0	11.0	767	314	237	472	237	1262	20	300	350	305	265	18	18
18.5	15.0	827	314	237	472	237	1322	20	300	350	305	265	18	18
-	18.5	831	356	286	521	237	1326	20	300	350	305	265	18	18
22.0	-	827	356	286	521	237	1322	20	300	350	305	265	18	18
-	22.0	861	356	286	521	237	1356	20	300	350	305	265	18	18
30.0	-	884	396	315	575	227	1379	25	350	400	350	300	18	20
37.0	30.0	909	396	315	575	227	1404	25	350	400	350	300	18	20
-	37.0	929	449	338	633	223	1422	25	400	450	385	335	18	20
45.0	-	987	449	338	563	508	1482	25	356	436	361	311	19	34
55.0	-	1059	497	410	660	560	1554	30	406	490	409	349	24	40
75.0	-	1132	551	433	713	582	1627	55.5	457	540	479	368	24	40

TFS5, FFS5

50 Hz

Screw spindles

2-pole motor rotation speed 2900 RPM							4-pole motor rotation speed 1450 RPM					
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s			1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
TFS5120/	Q_{Th}¹⁾ 391.8		–	–	–	–	Q_{Th}¹⁾ 195.9		–	–	–	–
10	372	382	7.5	8.7	11.0	142	176	186	3.6	4.1	5.5	130
20	366	379	14.1	15.6	18.5	161	171	183	6.8	7.6	11.0	150
30	361	376	20.6	22.5	30.0	295	165	180	10.1	11.1	15.0	167
40	355	373	27.1	29.5	37.0	320	160	177	13.4	14.6	18.5	232
50	350	370	33.7	36.4	45.0	385	154	175	16.6	18.1	22.0	237
60	345	368	40.2	43.3	45.0	385	149	172	19.9	21.6	22.0	237
70	340	366	46.7	50.2	55.0	460	144	170	23.2	25.1	30.0	310
80	336	364	53.2	57.1	75.0	585	140	168	26.4	28.6	30.0	310
90	331	362	59.8	64.0	75.0	585	134	166	29.7	32.1	37.0	355
100	327	360	66.3	71.0	75.0	585	129	164	33.0	35.6	37.0	355
110	322	358	72.8	77.9	90.0	665	–	–	–	–	–	–
120	318	357	79.4	84.8	90.0	665	–	–	–	–	–	–
TFS5130/	Q_{Th}¹⁾ 424.5		–	–	–	–	Q_{Th}¹⁾ 212.2		–	–	–	–
10	403	412	8.1	9.2	15.0	151	191	199	3.8	4.3	5.5	130
20	396	407	15.1	16.5	18.5	161	184	195	7.4	8.0	11.0	150
30	389	402	22.2	23.7	30.0	295	177	190	10.9	11.7	15.0	167
40	383	398	29.3	31.0	37.0	320	171	186	14.4	15.3	18.5	232
50	377	394	36.4	38.3	45.0	385	165	181	18.0	19.0	22.0	237
60	371	390	43.4	45.6	55.0	460	159	177	21.5	22.7	30.0	310
70	366	386	50.5	52.8	55.0	460	154	174	25.1	26.4	30.0	310
80	361	382	57.6	60.1	75.0	585	149	170	28.6	30.0	37.0	355
90	357	379	64.7	67.4	75.0	585	143	166	32.1	33.7	37.0	355
100	352	375	71.7	74.7	90.0	665	138	163	35.7	37.4	45.0	390
110	347	372	78.8	81.9	90.0	665	–	–	–	–	–	–
120	343	369	85.9	89.2	110.0	825	–	–	–	–	–	–

¹⁾ Q_{Th}: Theoretical flow rate

Viscosity > 20 mm²/s more power consumption.

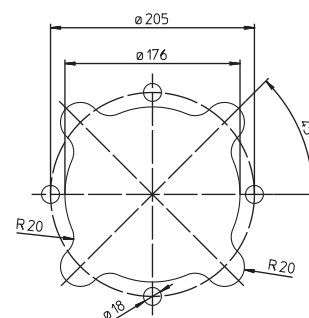
Characteristics and dimensions

TFS5, FFS5

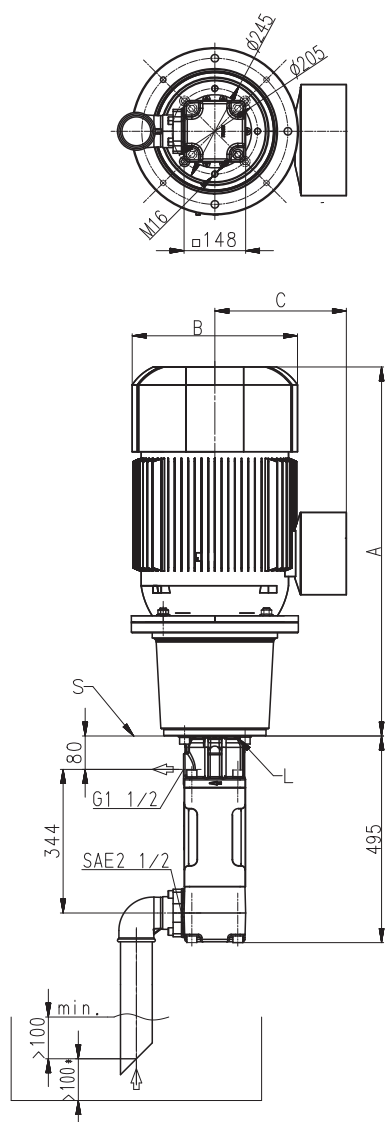
50 Hz

Mounting hole patterns

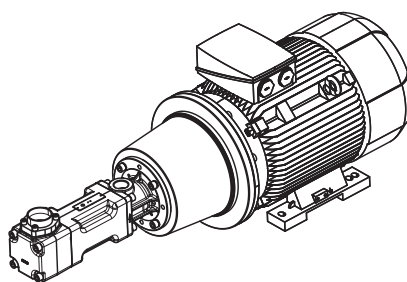
TFS5



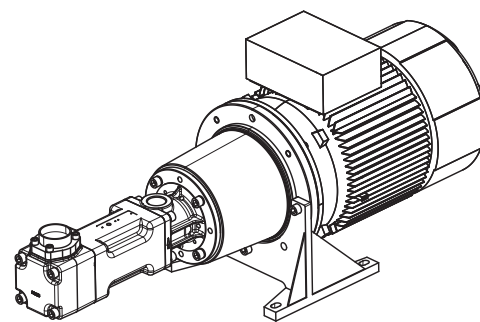
All corners must be deburred
According to ISO 2768-m



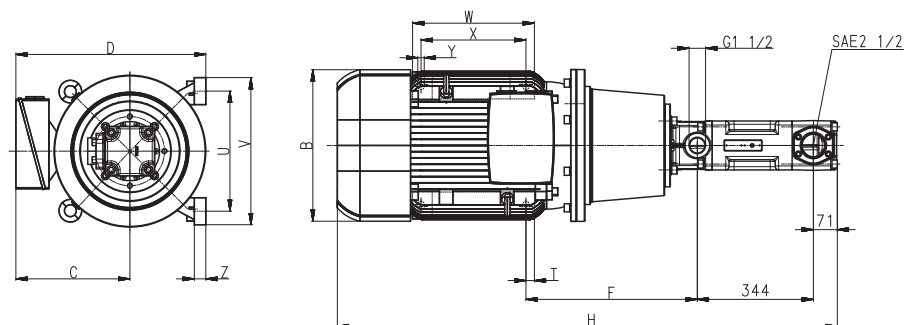
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



< 45kW



≥ 45kW



Power 2-poles kW	Power 4-poles kW	A mm	B mm	C mm	D mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	5.5	672	262	202	387	222	1167	22.5	265	300	270	225	14	18
11.0 / 15.0	11.0	767	314	237	472	237	1262	20	300	350	305	265	18	18
-	18.5	827	314	237	472	237	1322	20	300	350	305	265	18	18
-	18.5	831	356	286	521	237	1326	20	300	350	305	265	18	18
-	22.0	861	356	286	521	237	1356	20	300	350	305	265	18	18
30.0	-	884	396	315	575	227	1379	25	350	400	350	300	18	20
37.0	30.0	909	396	315	575	227	1404	25	350	400	350	300	18	20
-	37.0	929	449	338	633	223	1422	25	400	450	385	335	18	20
45.0	45.0	987	449	338	563	508	1482	25	356	436	361	311	19	34
55.0	-	1059	497	410	660	560	1554	30	406	490	409	349	24	40
75.0	-	1132	551	433	713	582	1627	55.5	457	540	479	368	24	40
90.0	-	1243	551	433	713	582	1738	30	457	540	479	419	24	40
110.0	-	1239	616	515	830	623	1734	35	508	610	527	406	28	50

2-pole motor rotation speed 2900 RPM							4-pole motor rotation speed 1450 RPM					
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s			1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
TFS690/	Q_{Th}¹⁾ 459		-	-	-	-	Q_{Th}¹⁾ 230		-	-	-	-
10	445	450	9.5	11.2	15.0	199	216	220	4.4	5.1	7.5	178
20	437	445	17.1	18.8	22.0	220	207	216	8.3	9.0	11.0	198
30	429	440	24.8	26.5	30.0	343	199	211	12.1	12.8	15.0	215
40	421	436	32.4	34.1	37.0	368	191	206	15.9	16.6	18.5	280
50	414	432	40.1	41.8	45.0	433	184	202	19.7	20.4	22.0	285
60	407	428	47.7	49.4	55.0	508	177	198	23.6	24.3	30.0	358
70	401	424	55.4	57.1	75.0	633	171	194	27.4	28.1	30.0	358
80	395	420	63.0	64.7	75.0	633	165	190	31.2	31.9	37.0	403
TFS6120/	Q_{Th}¹⁾ 612		-	-	-	-	Q_{Th}¹⁾ 306		-	-	-	-
10	594	600	12.0	13.7	18.5	209	288	294	5.7	6.4	7.5	178
20	584	594	22.2	23.9	30.0	343	278	288	10.8	11.5	15.0	215
30	574	588	32.4	34.1	37.0	368	268	282	15.9	16.6	18.5	280
40	565	583	42.6	44.3	55.0	508	259	277	21.0	21.7	30.0	358
50	557	578	52.8	54.5	75.0	633	251	272	26.1	26.8	30.0	358
60	549	573	63.0	64.7	75.0	633	243	267	31.2	31.9	37.0	403
70	542	568	73.2	74.9	90.0	713	236	262	36.3	37.0	45.0	438
80	533	563	83.4	85.1	90.0	713	227	257	41.4	42.1	45.0	438
TFS6145/	Q_{Th}¹⁾ 740		-	-	-	-	Q_{Th}¹⁾ 370		-	-	-	-
10	717	725	14.1	15.8	22.0	220	348	355	6.8	7.5	11.0	198
20	704	715	26.5	28.2	37.0	368	334	345	12.9	13.6	15.0	215
30	692	706	38.8	40.5	45.0	433	322	337	19.1	19.8	22.0	285
40	680	698	51.1	52.8	55.0	508	310	328	25.3	26.0	30.0	358
50	669	691	63.4	65.1	75.0	633	299	321	31.4	32.1	37.0	403
60	658	684	75.8	77.5	90.0	713	288	314	37.6	38.3	45.0	438
70	646	676	88.1	89.8	110.0	872	276	306	43.8	44.5	55.0	543
80	635	668	100.4	102.1	110.0	872	265	298	49.9	50.6	55.0	543

¹⁾ Q_{Th}: Theoretical flow rate

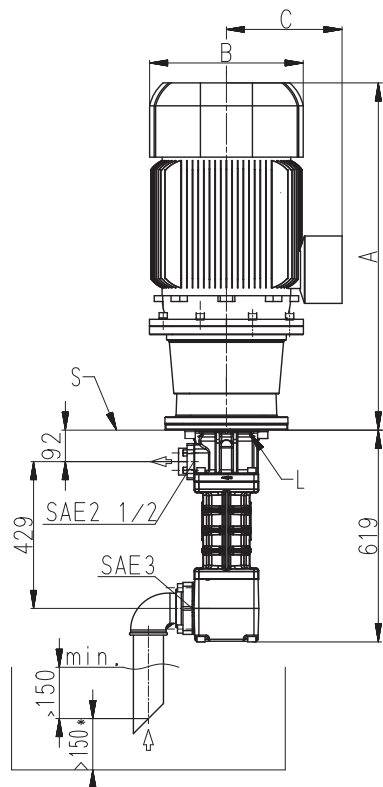
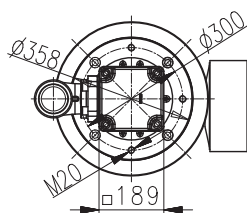
Viscosity > 20 mm²/s more power consumption.

All 6 series screw pumps with an operating flow rate of 800 l/min or above must be operated with a feed pump which supplies fluid with at least 1bar of pressure to the pump inlet.

Characteristics and dimensions

TFS6, FFS6

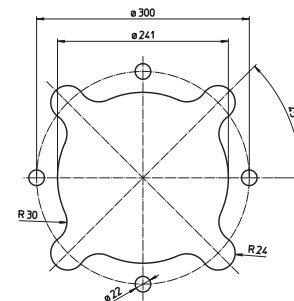
50 Hz



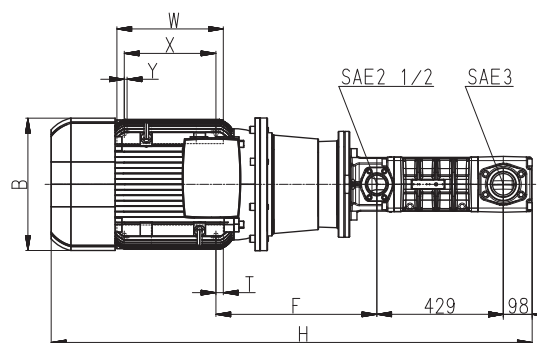
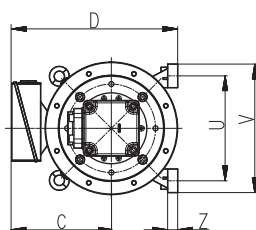
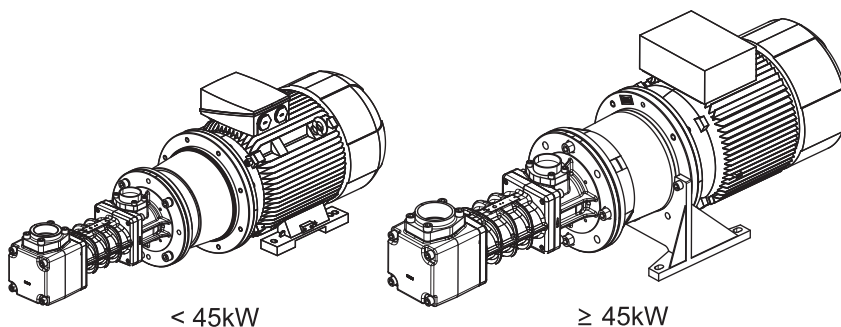
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole

Mounting hole patterns

TFS6



All corners must be deburred!
According to ISO 2768-m



Power 2-poles kW	Power 4-poles kW	A mm	B mm	C mm	D mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	7.5	723	262	202	387	242	1342	22.5	265	300	270	225	14	18
-	11.0	795	314	237	472	242	1414	20	300	350	305	265	18	18
15.0	-	795	314	237	497	242	1414	25	350	400	350	300	18	20
-	15.0	855	314	237	472	265	1474	20	300	350	305	265	18	18
18.5	-	855	314	237	497	242	1474	25	350	400	350	300	18	20
-	18.5	859	356	286	521	265	1478	20	300	350	305	265	18	18
22.0	-	855	356	286	546	242	1474	25	350	400	350	300	18	20
-	22.0	889	356	286	521	397	1508	20	300	350	305	265	18	18
30.0	-	910	396	315	575	265	1529	25	350	400	350	300	18	20
-	30.0	935	396	315	575	417	1554	25	350	400	350	300	18	20
37.0	-	935	396	315	575	265	1554	25	350	400	350	300	18	20
-	37.0	973	449	338	575	432	1592	25	400	450	385	335	18	20
45.0	45.0	1013	449	338	563	546	1632	25	356	436	361	311	19	34
55.0	-	1072	497	410	660	585	1691	30	406	490	409	349	24	40
75.0	-	1160	551	433	713	622	1779	55.5	457	540	479	368	24	40
90.0	-	1270	551	433	713	622	1889	30	457	540	479	419	24	40
110.0	-	1242	616	515	830	638	1861	60.5	508	610	527	406	28	50

High Pressure Pumps

BFS1, FFS1

Screw spindles

60 Hz

2-pole motor rotation speed 3500 RPM									4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor immersion version			Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3 / NEMA	IE3	NEMA		IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	
Type / bar	l/min	l/min	kW	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
BFS130/	Q_{Th}¹⁾ 18.8		-	-	-	-	-	-	Q_{Th}¹⁾ 9.4		-	-	-	-	-
10	17.3	18.2	0.6	0.6	B 1.49	0.86	0.75	39	7.9	8.8	0.3	0.3	0.86	0.75	30
20	16.3	17.8	0.9	0.9	B 1.49	1.27	1.1	39	6.9	8.4	0.4	0.4	0.86	0.75	30
30	15.4	17.5	1.2	1.2	B 1.49	1.75	1.5	39	5.9	8	0.6	0.6	0.86	0.75	30
40	14.5	17.1	1.5	1.5	B 1.75	1.75	2.2	39	5	7.7	0.7	0.8	1.27	1.1	32
50	13.6	16.7	1.8	1.9	B 2.18	2.54	2.2	44	4	7.3	0.9	1.0	1.27	1.1	32
60	12.7	16.4	2.1	2.2	B 2.55	2.54	3.0	44	3.2	7	1.0	1.1	1.27	1.5	32
70	11.9	16	2.4	2.5	B 2.94	3.45	3.0	45	-	6.6	-	1.3	1.75	1.5	34
80	11.1	15.7	2.8	2.9	B 3.45	3.45	3.7	57	-	6.3	-	1.5	1.75	2.2	34
90	10.4	15.4	3.1	3.2	B 3.8	3.45	3.7	57	-	6	-	1.6	1.75	2.2	34
100	9.6	15.1	3.4	3.5	B 3.8	4.55	3.7	57	-	5.6	-	1.8	2.55	2.2	45
110	8.7	14.7	3.7	3.9	B 4.55	4.55	5.5	58	-	5.3	-	2.0	2.55	2.2	45
120	7.8	14.4	4.0	4.2	B 4.55	4.55	5.5	58	-	5	-	2.1	2.55	2.2	45
130	-	14.1	-	4.5	B 5.75	6.3	5.5	63	-	-	-	-	-	-	-
140	-	13.8	-	4.9	B 5.75	6.3	5.5	63	-	-	-	-	-	-	-
150	-	13.5	-	5.2	B 5.75	6.3	5.5	63	-	-	-	-	-	-	-
BFS140/	Q_{Th}¹⁾ 25.2		-	-	-	-	-	-	Q_{Th}¹⁾ 12.6		-	-	-	-	-
10	23.1	24.4	0.7	0.7	B 1.49	1.27	1.1	39	10.5	11.8	0.3	0.4	0.86	0.75	30
20	21.8	23.9	1.1	1.2	B 1.49	1.75	1.5	39	9.2	11.3	0.5	0.6	0.86	0.75	30
30	20.6	23.4	1.5	1.6	B 1.75	1.75	2.2	39	8	10.7	0.7	0.8	1.27	1.1	32
40	19.5	22.9	1.9	2.0	B 2.18	2.54	2.2	44	6.9	10.2	0.9	1.0	1.27	1.1	32
50	18.4	22.4	2.4	2.5	B 2.94	3.45	3.0	45	5.8	9.8	1.1	1.2	1.75	1.5	34
60	17.3	21.9	2.8	2.9	B 3.45	3.45	3.0	57	4.7	9.3	1.3	1.5	1.75	1.5	34
70	16.4	21.4	3.2	3.3	B 3.8	4.55	3.7	57	3.8	8.8	1.5	1.7	2.55	2.2	45
80	15.4	20.9	3.6	3.8	B 4.55	4.55	5.5	58	-	8.3	-	1.9	2.55	2.2	45
90	14.6	20.5	4.0	4.2	B 4.55	4.55	5.5	58	-	7.9	-	2.1	2.55	2.2	45
100	13.8	20	4.5	4.7	B 5.75	6.3	5.5	63	-	7.4	-	2.3	2.55	3.0	45
110	12.6	19.6	4.9	5.1	B 5.75	6.3	5.5	63	-	7	-	2.5	3.45	3.0	45
120	11.6	19.2	5.3	5.5	B 5.75	6.3	5.5	63	-	6.5	-	2.7	3.45	3.0	45
130	10.6	18.7	5.7	6.0	B 6.3	6.3	7.5	63	-	-	-	-	-	-	-
140	9.7	18.3	6.1	6.4	B 8.6	8.6	7.5	94	-	-	-	-	-	-	-
150	8.8	17.9	6.6	6.9	B 8.6	8.6	7.5	94	-	-	-	-	-	-	-

¹⁾ Q_{Th}: Theoretical flow rate

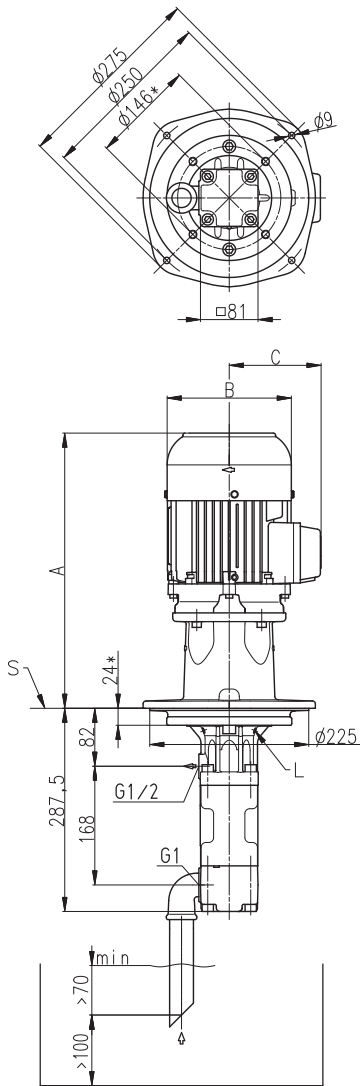
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

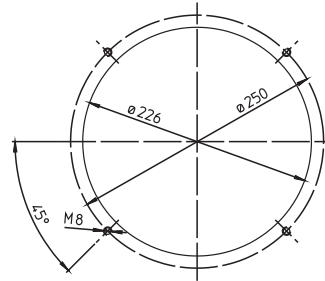
BFS1, FFS1

60 Hz

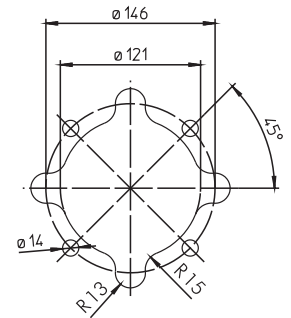


Mounting hole patterns

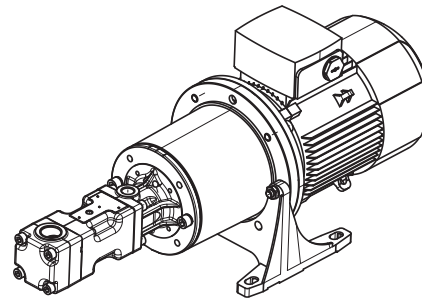
BFS1 / BFS2



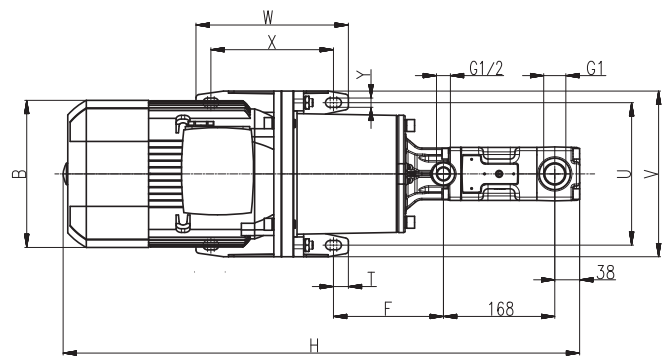
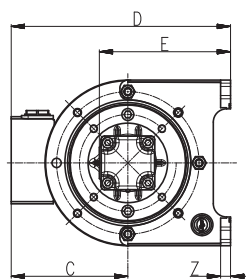
TFS1 / TFS2



All corners must be deburred! According to ISO 2768-m



*) Dimensions for 4-pole standard motor upon request
 L = Leakage hole
 S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	A mm	B mm	C mm
B 1.49 / 1.75	415	176	130
B 2.18 / 2.55 / 2.94	474	176	130
B 3.45 / 3.8 / 4.55	513	218	150
B 5.75 / 6.3	543	218	150
B 8.6	622	258	193

Power 2-poles kW	Power 4-poles kW	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
0.75 / 0.86	-	159	121	233	155	138	676	15	180	210	90	60	11	12
-	0.75 / 0.86	159	121	233	155	138	751	15	180	210	90	60	11	12
1.1 / 1.27	-	159	121	233	155	138	711	15	180	210	90	60	11	12
1.5 / 1.75	1.1 / 1.27 / 1.5 / 1.75	178	126	238	155	138	721	15	180	210	90	60	11	12
2.2 / 2.54	-	178	126	238	155	138	761	15	180	210	90	60	11	12
3.0 / 3.45	2.2 / 2.55 / 3.0 / 3.45	198	166	321	198	166	821	22.5	215	250	230	185	14	15
3.7 / 4.55	-	222	177	332	198	166	805	22.5	215	250	230	185	14	15
5.5 / 6.3	-	262	202	387	228	171	857	22.5	265	300	270	225	14	18
7.5 / 8.6	-	262	202	387	228	171	907	22.5	265	300	270	225	14	18

High Pressure Pumps

BFS2, FFS2

Screw spindles



2-pole motor rotation speed 3500 RPM									4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor immersion ver- sion			Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3 / NEMA	IE3	NEMA		IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	
Type / bar	l/min	l/min	kW	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
BFS232/	Q_{Th}¹⁾ 31.5		-	-	-	-	-	-	Q_{Th}¹⁾ 15.8		-	-	-	-	-
10	29.7	30.8	0.8	0.9	B 1.49	1.27	1.5	40	13.9	15.1	0.4	0.5	0.86	0.75	31
20	29	30.6	1.4	1.4	B 1.75	1.75	2.2	40	13.3	14.8	0.7	0.7	0.86	1.1	31
30	28.4	30.3	1.9	2.0	B 2.18	2.54	2.2	45	12.7	14.6	0.9	1.0	1.27	1.1	33
40	27.8	30	2.4	2.5	B 2.94	3.45	3.0	46	12.1	14.3	1.2	1.3	1.75	1.5	35
50	27.2	29.8	2.9	3.1	B 3.8	3.45	3.7	58	11.5	14	1.4	1.5	1.75	2.2	35
60	26.6	29.5	3.5	3.6	B 3.8	4.55	3.7	58	10.9	13.8	1.7	1.8	2.55	2.2	46
70	26	29.3	4.0	4.2	B 4.55	4.55	5.5	59	10.3	13.5	2.0	2.1	2.55	2.2	46
80	25.4	29	4.5	4.7	B 5.75	6.3	5.5	64	9.7	13.3	2.2	2.3	2.55	3.0	46
90	24.9	28.7	5.0	5.3	B 5.75	6.3	5.5	64	9.1	13	2.5	2.6	3.45	3.0	46
100	24.3	28.5	5.6	5.8	B 6.3	6.3	7.5	64	8.5	12.7	2.7	2.9	3.45	3.0	46
110	23.8	28.3	6.1	6.4	B 8.6	8.6	7.5	94	-	12.5	-	3.2	3.45	3.7	46
120	23.2	28	6.6	6.9	B 8.6	8.6	7.5	94	-	12.3	-	3.4	4.55	3.7	50
130	22.7	27.8	7.1	7.5	B 8.6	8.6	11.0	94	-	12	-	3.7	4.55	3.7	50
140	22.1	27.5	7.7	8.0	B 8.6	8.6	11.0	94	-	11.8	-	4.0	4.55	5.5	50
150	21.6	27.3	8.2	8.6	B 10.3	12.6	11.0	100	-	11.6	-	4.2	4.55	5.5	50
BFS238/	Q_{Th}¹⁾ 37.4		-	-	-	-	-	-	Q_{Th}¹⁾ 18.7		-	-	-	-	-
10	35.2	36.5	0.9	0.9	B 1.49	1.27	1.5	40	16.5	17.8	0.4	0.4	0.86	0.75	31
20	34.5	36.2	1.6	1.6	B 1.95	2.54	2.2	41	15.8	17.5	0.8	0.8	1.27	1.1	33
30	33.8	35.9	2.2	2.2	B 2.55	2.54	3.0	45	15.1	17.2	1.1	1.1	1.27	1.5	33
40	33.1	35.6	2.8	2.9	B 3.45	3.45	3.7	58	14.4	16.9	1.4	1.4	1.75	2.2	35
50	32.4	35.3	3.4	3.5	B 3.8	4.55	3.7	58	13.7	16.6	1.7	1.8	2.55	2.2	46
60	31.7	35.1	4.1	4.2	B 4.55	4.55	5.5	59	13	16.4	2.0	2.1	2.55	2.2	46
70	31	34.8	4.7	4.8	B 5.75	6.3	5.5	64	12.3	16.1	2.3	2.4	3.45	3.0	46
80	30.3	34.5	5.3	5.5	B 5.75	6.3	7.5	64	11.6	15.8	2.6	2.7	3.45	3.0	46
90	29.6	34.2	5.9	6.1	B 6.3	6.3	7.5	64	10.9	15.5	2.9	3.1	3.45	3.7	46
100	29	34	6.6	6.8	B 8.6	8.6	7.5	94	10.2	15.3	3.2	3.4	4.55	3.7	50
110	28.3	33.7	7.2	7.4	B 8.6	8.6	11.0	94	-	15	-	3.7	4.55	3.7	50
120	27.6	33.4	7.8	8.1	B 8.6	8.6	11.0	94	-	14.7	-	4.1	4.55	5.5	50
130	27	33.1	8.4	8.8	B 10.3	12.6	11.0	100	-	14.4	-	4.4	6.3	5.5	82
140	26.3	32.9	9.0	9.4	B 10.3	12.6	11.0	100	-	14.2	-	4.7	6.3	5.5	82
150	25.7	32.6	9.7	10.1	B 12.6	12.6	11.0	122	-	13.9	-	5.0	6.3	5.5	82

¹⁾ Q_{Th}: Theoretical flow rate

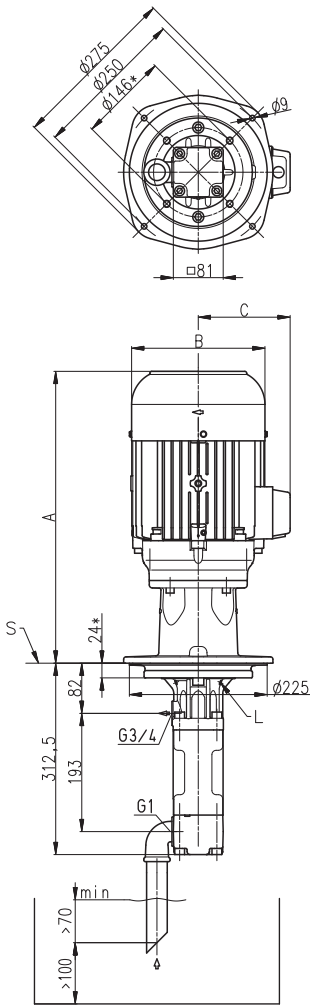
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

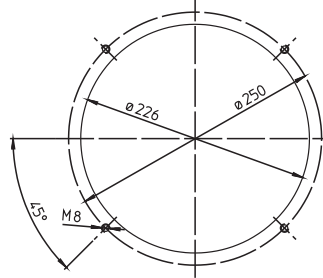
BFS2, FFS2

60 Hz

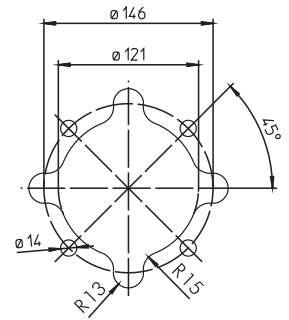


Mounting hole patterns

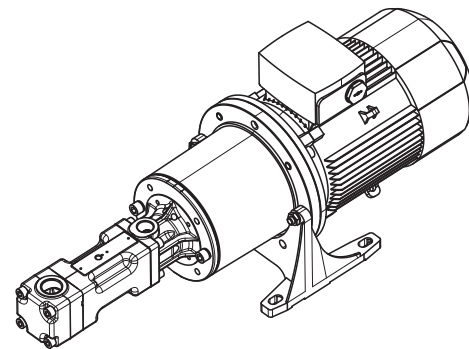
BFS1 / BFS2



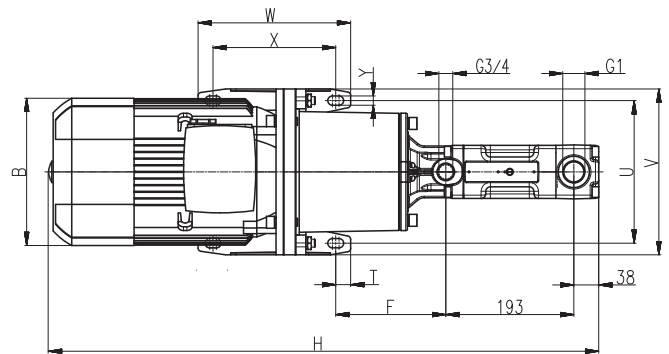
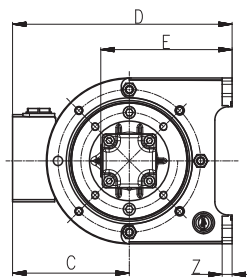
TFS1 / TFS2



All corners must be deburred!
According to ISO 2768-m



*) Dimensions for 4-pole standard motor upon request
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	A mm	B mm	C mm
B 1.49 / 1.75	415	176	130
B 1.95	441	176	130
B 2.18 / 2.55 / 2.94	474	176	130
B 3.45 / 3.8 / 4.55	513	218	150
B 5.75 / 6.3	543	218	150
B 8.6 / 10.3	622	258	193
B 12.6	630	310	240

Power 2-poles kW	Power 4-poles kW	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	0.75 / 0.86	159	121	233	155	138	776	15	180	210	90	60	11	12
1.5 / 1.75	1.1 / 1.27 / 1.5 / 1.75	178	126	238	155	138	746	15	180	210	90	60	11	12
1.27	-	159	121	233	155	138	736	15	180	210	90	60	11	12
2.2 / 2.54	-	178	126	238	155	138	786	15	180	210	90	60	11	12
3.0 / 3.45	2.2 / 2.55 / 3.0 / 3.45	198	166	321	198	166	846	22.5	215	250	230	185	14	15
3.7 / 4.55	3.7 / 4.55	222	177	332	198	166	830	22.5	215	250	230	185	14	15
5.5 / 6.3	-	262	202	387	228	171	882	22.5	265	300	270	225	14	18
7.5 / 8.6	5.5 / 6.3	262	202	387	228	171	932	22.5	265	300	270	225	14	18
11.0 / 12.6	-	314	237	472	278	210	1051	20	300	350	305	265	18	18

High Pressure Pumps

BFS2, FFS2

Screw spindles



		2-pole motor rotation speed 3500 RPM							4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor immersion version		Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight	
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3 / NEMA	IE3		NEMA	IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		IE3
Type / bar	l/min	l/min	kW	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
BFS250/	Q_{Th}¹⁾ 49.2		-	-	-	-	-	-	Q_{Th}¹⁾ 24.6		-	-	-	-	-
10	46.4	48	1.1	1.2	B 1.75	1.75	2.2	40	21.8	23.4	0.5	0.6	0.86	0.75	31
20	45.4	47.7	2.0	2.0	B 2.55	2.54	3.0	45	20.8	23	1.0	1.0	1.27	1.5	33
30	44.5	47.3	2.8	2.9	B 3.45	3.45	3.7	58	19.9	22.7	1.4	1.4	1.75	2.2	35
40	43.6	46.9	3.6	3.8	B 4.55	4.55	5.5	59	19	22.3	1.8	1.9	2.55	2.2	46
50	42.7	46.6	4.4	4.6	B 5.75	6.3	5.5	64	18.1	21.9	2.2	2.3	2.55	3.0	46
60	41.9	46.2	5.2	5.5	B 5.75	6.3	7.5	64	17.3	21.6	2.6	2.7	3.45	3.0	46
70	41.1	45.8	6.1	6.3	B 8.6	8.6	7.5	94	16.5	21.2	3.0	3.2	3.45	3.7	46
80	40.3	45.4	6.9	7.2	B 8.6	8.6	11.0	94	15.7	20.8	3.4	3.6	4.55	3.7	50
90	39.6	45.1	7.7	8.1	B 8.6	8.6	11.0	94	14.9	20.4	3.8	4.0	4.55	5.5	50
100	38.9	44.7	8.5	8.9	B 10.3	12.6	11.0	100	14	20.1	4.2	4.5	6.3	5.5	82
110	37.6	44.3	9.3	9.8	B 12.6	12.6	11.0	122	-	19.7	-	4.9	6.3	5.5	82
120	36.3	43.9	10.2	10.5	B 12.6	12.6	11.0	122	-	19.3	-	5.3	6.3	5.5	82
130	35.1	43.5	11.0	11.5	B 12.6	12.6	15.0	122	-	18.9	-	5.8	6.3	7.5	82
140	33.8	43.1	11.8	12.3	B 15.0	17.3	15.0	122	-	18.5	-	6.2	8.6	7.5	82
150	32.6	42.7	12.6	13.2	B 15.0	17.3	15.0	122	-	18.1	-	6.6	8.6	7.5	82
BFS260/	Q_{Th}¹⁾ 59		-	-	-	-	-	-	Q_{Th}¹⁾ 29.5		-	-	-	-	-
10	55.6	57.6	1.3	1.5	B 2.18	2.54	2.2	45	26.1	28	0.6	0.7	1.27	1.1	33
20	54.4	57	2.3	2.5	B 3.45	3.45	3.0	58	24.9	27.5	1.1	1.3	2.55	1.5	46
30	53.3	56.4	3.3	3.6	B 4.55	4.55	5.5	59	23.8	26.9	1.6	1.8	2.55	2.2	46
40	52.1	55.8	4.3	4.6	B 5.75	6.3	5.5	64	22.6	26.3	2.1	2.3	2.55	3.0	46
50	51	55.2	5.2	5.7	B 6.3	6.3	7.5	64	21.5	25.7	2.6	2.9	3.45	3.0	46
60	49.8	54.6	6.2	6.7	B 8.6	8.6	7.5	94	20.3	25.1	3.1	3.4	4.55	3.7	50
70	48.6	54	7.2	7.8	B 8.6	8.6	11.0	94	19.1	24.5	3.6	3.9	4.55	5.5	50
80	47.5	53.4	8.2	8.8	B 12.6	12.6	11.0	122	18	23.9	4.1	4.4	6.3	5.5	82
90	46.3	52.8	9.2	9.9	B 12.6	12.6	11.0	122	16.8	23.2	4.6	5.0	6.3	5.5	82
100	45.1	52.1	10.2	11.0	B 12.6	12.6	15.0	122	15.7	22.6	5.1	5.5	6.3	5.5	82
110	43.5	51.5	11.2	12.1	B 12.6	12.6	15.0	122	-	22	-	6.0	8.6	7.5	82
120	41.9	50.8	12.1	13.1	B 15.0	17.3	15.0	122	-	21.3	-	6.6	8.6	7.5	82
130	40.2	49.6	13.1	14.2	B 15.0	17.3	15.0	122	-	-	-	-	-	-	-
140	38.6	48.3	14.1	15.2	-	17.3	18.5	103	-	-	-	-	-	-	-
150	37	47.1	15.1	16.3	-	17.3	18.5	103	-	-	-	-	-	-	-

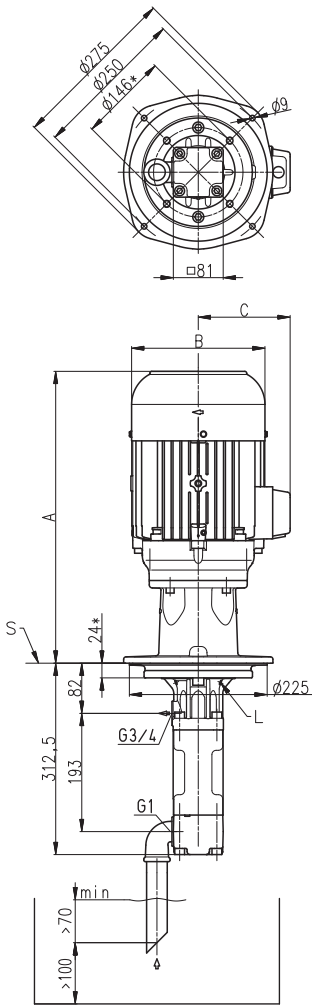
¹⁾ Q_{Th}: Theoretical flow rate

Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

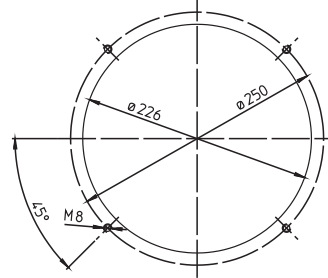
Characteristics and dimensions

BFS2, FFS2

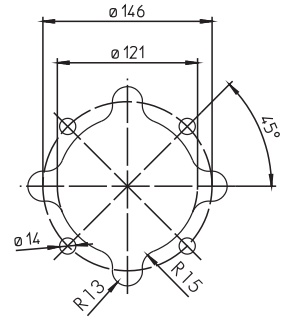


Mounting hole patterns

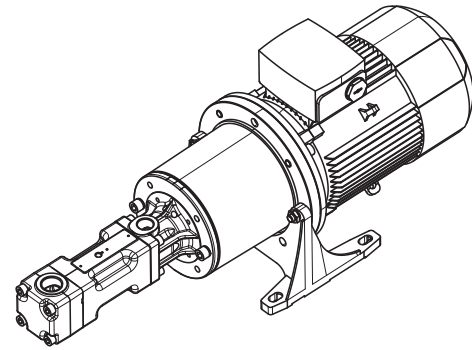
BFS1 / BFS2



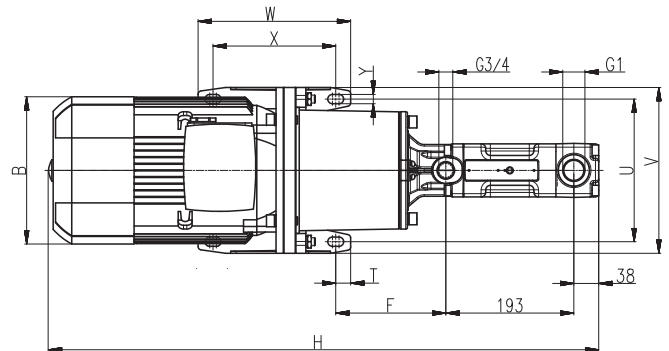
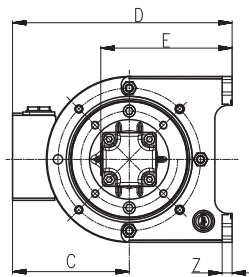
TFS1 / TFS2



All corners must be deburred!
According to ISO 2768-m



*) Dimensions for 4-pole standard motor upon request
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	A mm	B mm	C mm
B 1.75	415	176	130
B 2.18 / 2.55	474	176	130
B 3.45 / 4.55	513	218	150
B 5.75 / 6.3	543	218	150
B 8.6 / 10.3	622	258	193
B 12.6 / 15.0	630	310	240

Power 2-poles kW	Power 4-poles kW	B mm	C mm	D mm	E mm	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	0.75 / 0.86	159	121	233	155	138	776	15	180	210	90	60	11	12
1.75	1.1 / 1.27 / 1.5 / 1.75	178	126	238	155	138	746	15	180	210	90	60	11	12
2.2 / 2.54	-	178	126	238	155	138	786	15	180	210	90	60	11	12
3.0 / 3.45	2.2 / 2.55 / 3.0 / 3.45	198	166	321	198	166	846	22.5	215	250	230	185	14	15
3.7 / 4.55	3.7 / 4.55	222	177	332	198	166	830	22.5	215	250	230	185	14	15
5.5 / 6.3	-	262	202	387	228	171	882	22.5	265	300	270	225	14	18
7.5 / 8.6	5.5 / 6.3	262	202	387	228	171	932	22.5	265	300	270	225	14	18
-	7.5 / 8.6	262	202	387	228	171	940	22.5	265	300	270	225	14	18
11.0 / 12.6 / 15.0 / 17.3	-	314	237	472	278	210	1051	20	300	350	305	265	18	18
18.5	-	314	237	472	278	210	1111	20	300	350	305	265	18	18

High Pressure Pumps

TFS3, FFS3

Screw spindles



		2-pole motor rotation speed 3500 RPM						4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor		Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	NEMA		IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
TFS348/	Q_{Th}¹⁾ 77.4		-	-	-	-	-	Q_{Th}¹⁾ 38.7		-	-	-	-	-
10	73.3	75.6	1.8	1.9	2.54	3.0	47	34.6	36.9	0.8	0.8	1.27	1.1	44
20	71.8	74.7	3.1	3.3	4.55	3.7	62	33.1	36	1.5	1.5	1.75	2.2	47
30	70.3	73.9	4.4	4.6	6.3	5.5	72	31.7	35.3	2.1	2.2	2.55	3.0	58
40	69	73.2	5.7	6.0	8.6	7.5	86	30.3	34.5	2.8	2.9	3.45	3.7	58
50	67.6	72.5	6.9	7.3	8.6	11.0	86	28.9	33.8	3.4	3.6	4.55	5.5	62
60	66.4	71.8	8.2	8.6	12.6	11.0	105	27.7	33.1	4.1	4.3	6.3	5.5	93
70	65.2	71.1	9.5	10.0	12.6	11.0	105	26.5	32.4	4.7	5.0	6.3	5.5	93
80	64	70.5	10.8	11.3	12.6	15.0	105	25.3	31.8	5.4	5.7	6.3	7.5	93
90	62.9	69.9	12.1	12.7	17.3	15.0	114	24	31.3	6.0	6.4	8.6	7.5	93
100	61.9	69.4	13.4	14.0	17.3	15.0	114	22.8	30.7	6.7	7.1	8.6	7.5	93
110	60	68.9	14.7	15.3	17.3	18.5	114	-	30.2	-	7.8	8.6	11.0	93
120	58.2	68.4	15.9	16.7	17.3	18.5	114	-	29.8	-	8.5	12.6	11.0	113
130	56.6	68	17.2	18.0	21.3	18.5	124	-	29.3	-	9.2	12.6	11.0	113
140	54.9	67.6	18.5	19.3	21.3	22.0	124	-	28.9	-	9.9	12.6	11.0	113
150	53.3	67.3	19.8	20.7	25.3	22.0	135	-	28.6	-	10.6	12.6	11.0	113
TFS364/	Q_{Th}¹⁾ 103.2		-	-	-	-	-	Q_{Th}¹⁾ 51.6		-	-	-	-	-
10	97.5	100.7	2.2	2.4	4.55	5.5	62	45.9	49.1	1.1	1.1	1.75	1.5	47
20	95.8	99.7	3.9	4.2	6.3	5.5	72	44.2	48.1	1.9	2.0	2.55	2.2	58
30	94	98.7	5.7	6.0	8.6	7.5	86	42.4	47.1	2.8	2.9	3.45	3.7	58
40	92.3	97.8	7.4	7.7	12.6	11.0	105	40.7	46.2	3.6	3.8	4.55	5.5	62
50	90.7	96.9	9.1	9.5	12.6	11.0	105	39.1	45.3	4.5	4.7	6.3	5.5	93
60	89.1	96.1	10.8	11.3	12.6	15.0	105	37.5	44.5	5.4	5.6	6.3	7.5	93
70	87.5	95.3	12.5	13.1	17.3	15.0	114	35.9	43.7	6.2	6.5	8.6	7.5	93
80	86	94.5	14.3	14.9	17.3	18.5	114	34.4	42.9	7.1	7.4	8.6	11.0	93
90	84.6	93.8	16.0	16.7	17.3	18.5	114	32.8	42.2	7.9	8.3	8.6	11.0	93
100	83.2	93.2	17.7	18.4	21.3	22.0	124	31.2	41.6	8.8	9.2	12.6	11.0	113
110	80.9	92.5	19.4	20.2	21.3	22.0	124	-	40.9	-	10.1	12.6	11.0	113
120	78.6	91.9	21.2	22.0	25.3	22.0	135	-	40.3	-	11.0	12.6	11.0	113
130	76.4	90.4	22.9	23.8	33.5	30.0	259	-	-	-	-	-	-	-
140	74.3	89	24.6	25.6	33.5	30.0	259	-	-	-	-	-	-	-
150	72.2	87.5	26.3	27.3	33.5	30.0	259	-	-	-	-	-	-	-
TFS376/	Q_{Th}¹⁾ 122.5		-	-	-	-	-	Q_{Th}¹⁾ 61.3		-	-	-	-	-
10	116.2	119.5	2.5	2.8	6.3	7.5	72	55	58.3	1.2	1.3	1.75	2.2	47
20	114.1	118.3	4.6	4.9	8.6	7.5	86	52.8	57.1	2.2	2.4	3.45	3.0	58
30	112	117.2	6.6	7.1	8.6	11.0	86	50.8	55.9	3.3	3.5	4.55	5.5	62
40	110	116.1	8.7	9.2	12.6	11.0	105	48.7	54.9	4.3	4.6	6.3	5.5	93
50	108	115.1	10.7	11.3	12.6	15.0	105	46.7	53.8	5.3	5.7	6.3	7.5	93
60	106	114.1	12.8	13.5	17.3	15.0	114	44.8	52.9	6.3	6.7	8.6	7.5	93
70	104.1	113.2	14.8	15.6	17.3	18.5	114	42.8	51.9	7.3	7.8	8.6	11.0	93
80	102.2	112.3	16.8	17.8	21.3	22.0	124	40.9	51	8.4	8.9	12.6	11.0	113
90	100.3	111.4	18.9	19.9	21.3	22.0	124	38.9	50.2	9.4	10.0	12.6	11.0	113
100	98.5	110.6	20.9	22.0	25.3	30.0	135	37	49.4	10.4	11.1	12.6	15.0	113
110	95.5	109.9	23.0	24.2	33.5	30.0	259	-	48.6	-	12.2	17.3	15.0	130
120	92.6	109.2	25.0	26.3	33.5	30.0	259	-	48	-	13.3	17.3	15.0	130
130	89.8	107.4	27.1	28.5	33.5	30.0	259	-	-	-	-	-	-	-
140	87	105.7	29.1	30.6	33.5	37.0	259	-	-	-	-	-	-	-
150	84.2	104	31.1	32.7	41.5	37.0	284	-	-	-	-	-	-	-

¹⁾ Q_{Th}: Theoretical flow rate

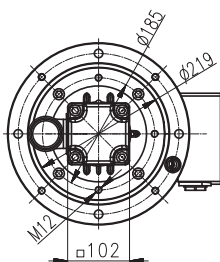
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

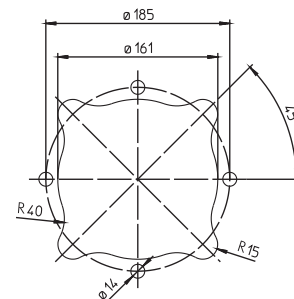
TFS3, FFS3

60 Hz

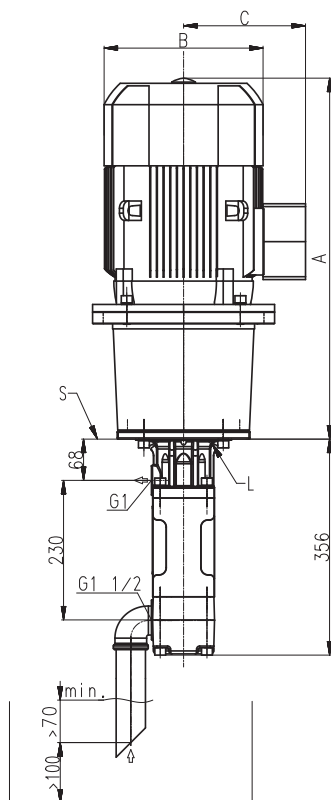


Mounting hole patterns

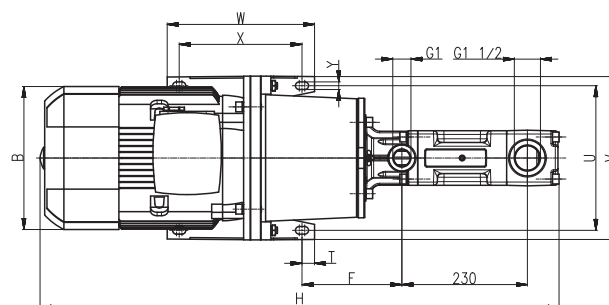
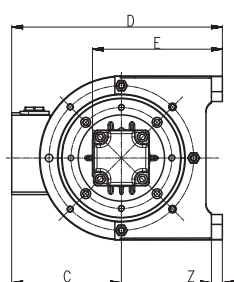
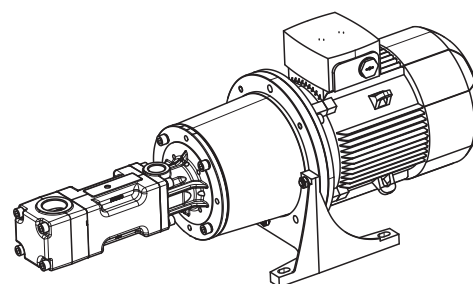
TFS3 / TFS4



All corners must be deburred!
According to ISO 2768-m



L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	Power 4-poles kW	A	B	C	D	E	F	H	T	U	V	W	X	Y	Z
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
–	1.1 / 1.27 / 1.5 / 1.75	476	178	126	238	165	167	847	15	180	210	90	60	11	12
3.0	2.2 / 2.55 / 3.0 / 3.45	568	198	166	321	208	186	924	22.5	215	250	230	185	14	15
2.54	–	516	178	126	238	165	167	887	15	180	210	90	60	11	12
3.7 / 4.55	3.7 / 4.55	551	222	177	332	208	186	907	22.5	215	250	230	185	14	15
5.5 / 6.3	–	595	262	202	387	238	183	951	22.5	265	300	270	225	14	18
7.5 / 8.6	5.5 / 6.3	645	262	202	387	238	183	1001	22.5	265	300	270	225	14	18
–	7.5 / 8.6	654	262	202	387	238	183	1010	22.5	265	300	270	225	14	18
11.0 / 12.6 / 15.0 / 17.3	11.0 / 12.6	764	314	237	472	288	222	1120	20	300	350	305	265	18	18
18.5 / 21.3	15.0 / 17.3	824	314	237	472	288	222	1180	20	300	350	305	265	18	18
22.0 / 25.3	–	824	356	286	521	288	222	1180	20	300	350	305	265	18	18
30.0 / 33.5	–	881	396	315	575	313	212	1237	25	350	400	350	300	18	20
37.0 / 41.5	–	906	396	315	575	313	212	1262	25	350	400	350	300	18	20

High Pressure Pumps

TFS4, FFS4

Screw spindles



2-pole motor rotation speed 3500 RPM								4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor		Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	NEMA		IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
TFS460/	Q_{Th}¹⁾ 151.2		-	-	-	-	-	Q_{Th}¹⁾ 75.6		-	-	-	-	-
10	144	147	3.3	3.7	4.55	5.5	72	68	72	1.6	1.6	2.55	2.2	68
20	141	146	5.8	6.4	8.6	7.5	96	65	70	2.8	2.9	3.45	3.7	68
30	138	144	8.4	9.0	12.6	11.0	115	63	69	4.1	4.3	4.55	5.5	72
40	136	143	10.9	11.7	12.6	15.0	115	60	67	5.3	5.6	6.3	7.5	103
50	133	142	13.4	14.4	17.3	18.5	124	57	66	6.6	7.0	8.6	7.5	103
60	131	140	15.9	17.0	21.3	18.5	134	55	65	7.9	8.4	8.6	11.0	103
70	128	139	18.4	19.7	21.3	22.0	134	53	63	9.1	9.7	12.6	11.0	123
80	126	138	21.0	22.3	25.3	30.0	145	50	62	10.4	11.1	12.6	15.0	123
90	124	137	23.5	25.0	33.5	30.0	269	48	61	11.6	12.4	17.3	15.0	140
100	122	136	26.0	27.7	33.5	30.0	269	45	60	12.9	13.8	17.3	15.0	140
110	120	135	28.5	30.3	33.5	37.0	269	-	59	-	15.2	17.3	18.5	140
120	117	134	31.1	33.0	41.5	37.0	294	-	58	-	16.5	17.3	18.5	140
<hr/>														
TFS480/	Q_{Th}¹⁾ 201.7		-	-	-	-	-	Q_{Th}¹⁾ 100.8		-	-	-	-	-
10	192	197	4.2	4.9	6.3	7.5	82	91	96	2.0	2.1	2.55	3.0	68
20	188	194	7.5	8.5	12.6	11.0	115	87	94	3.7	3.9	4.55	5.5	72
30	184	192	10.9	12.1	17.3	15.0	124	84	91	5.3	5.7	6.3	7.5	103
40	181	190	14.2	15.6	17.3	18.5	124	80	89	7.0	7.5	8.6	11.0	103
50	178	188	17.6	19.2	21.3	22.0	134	77	88	8.7	9.3	12.6	11.0	123
60	175	187	21.0	22.8	25.3	30.0	145	74	86	10.4	11.1	12.6	15.0	123
70	172	185	24.3	26.4	33.5	30.0	269	71	84	12.1	12.9	17.3	15.0	140
80	169	183	27.7	30.0	33.5	37.0	269	68	83	13.7	14.7	17.3	15.0	140
90	166	182	31.1	33.6	41.5	37.0	294	65	81	15.4	16.5	17.3	18.5	140
100	164	181	34.4	37.1	41.5	45.0	294	62	80	17.1	18.3	21.3	18.5	205
110	161	180	37.8	40.7	41.5	45.0	294	-	79	-	20.1	21.3	22.0	205
120	158	179	41.1	44.3	51.0	45.0	358	-	78	-	21.9	25.3	22.0	210
<hr/>														
TFS496/	Q_{Th}¹⁾ 242		-	-	-	-	-	Q_{Th}¹⁾ 121		-	-	-	-	-
10	231	235	4.8	5.6	8.6	7.5	96	110	114	2.3	2.7	3.45	3.7	68
20	226	233	8.9	9.9	12.6	11.0	115	105	112	4.3	4.8	6.3	5.5	103
30	222	231	12.9	14.2	17.3	18.5	124	101	110	6.3	7.0	8.6	7.5	103
40	218	229	16.9	18.5	21.3	22.0	134	97	108	8.4	9.1	12.6	11.0	123
50	214	227	21.0	22.8	25.3	30.0	145	93	106	10.4	11.3	12.6	15.0	123
60	211	225	25.0	27.1	33.5	30.0	269	90	104	12.4	13.5	17.3	15.0	140
70	207	224	29.0	31.4	33.5	37.0	269	86	103	14.4	15.6	17.3	18.5	140
80	204	222	33.1	35.7	41.5	37.0	294	83	101	16.4	17.8	21.3	18.5	205
90	201	220	37.1	40.0	41.5	45.0	294	79	99	18.4	19.9	21.3	22.0	205
100	198	219	41.1	44.3	51.0	55.0	358	76	98	20.5	22.1	25.3	22.0	210
110	195	217	45.2	48.6	51.0	55.0	358	-	96	-	24.3	34.5	30.0	284
120	191	215	49.2	52.9	62.0	55.0	433	-	94	-	26.4	34.5	30.0	284

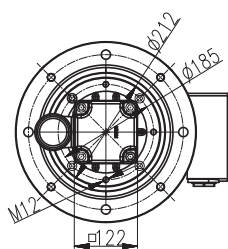
¹⁾ Q_{Th}: Theoretical flow rate

Viscosity > 20 mm²/s more power consumption.

Characteristics and dimensions

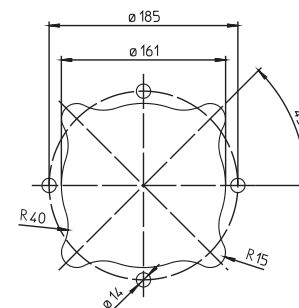
TFS4, FFS4

60 Hz

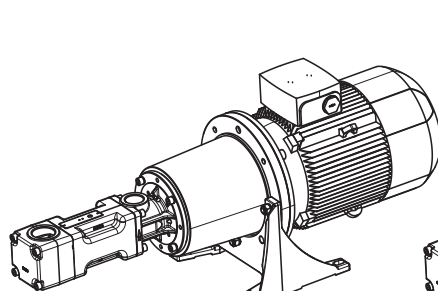
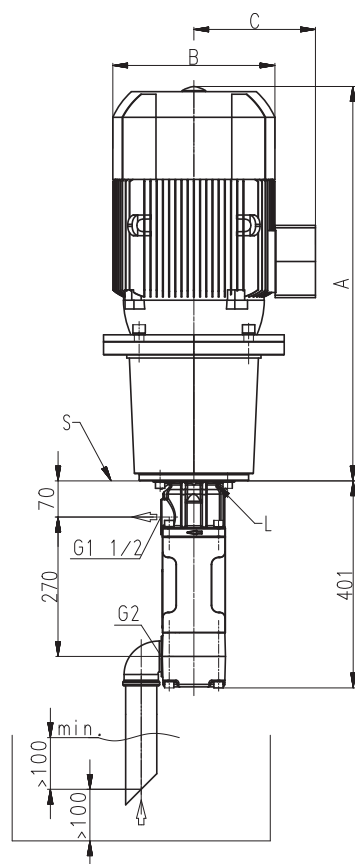


Mounting hole patterns

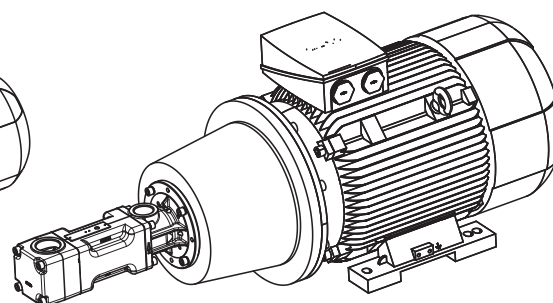
TFS3 / TFS4



All corners must be deburred!
According to ISO 2768-m

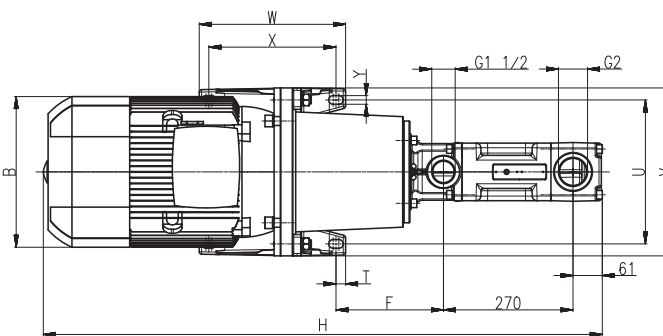
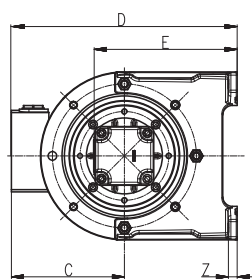


< 45kW



≥ 45kW

L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	Power 4-poles kW	A	B	C	D	E	F	H	T	U	V	W	X	Y	Z
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
–	2.2 / 2.55 / 3.0 / 3.45	568	198	166	321	218	188	969	22.5	215	250	230	185	14	15
4.55	3.7 / 4.55	551	222	177	332	218	188	952	22.5	215	250	230	185	14	15
5.5 / 6.3	–	609	262	202	387	248	199	1010	22.5	265	300	270	225	14	18
7.5 / 8.6	5.5 / 6.3	659	262	202	387	248	199	1060	22.5	265	300	270	225	14	18
–	7.5 / 8.6	668	262	202	387	248	199	1069	22.5	265	300	270	225	14	18
11.0 / 12.6 / 15.0 / 17.3	11.0 / 12.6	764	314	237	472	298	224	1165	20	300	350	305	265	18	18
18.5 / 21.3	15.0 / 17.3	824	314	237	472	298	224	1225	20	300	350	305	265	18	18
–	18.5 / 21.3	828	356	286	521	298	224	1229	20	300	350	305	265	18	18
22.0 / 25.3	–	824	356	286	521	298	224	1225	20	300	350	305	265	18	18
–	22.0 / 25.3	858	356	286	521	298	224	1259	20	300	350	305	265	18	18
30.0 / 33.5	–	881	396	315	575	323	214	1282	25	350	400	350	300	18	20
37.0 / 41.5	30.0 / 34.5	906	396	315	575	323	214	1307	25	350	400	350	300	18	20
45.0 / 51.0	–	984	449	338	563	288	495	1385	25	356	436	361	311	19	34
55.0 / 62.0	–	1056	497	410	660	313	547	1457	30	406	490	409	349	24	40

High Pressure Pumps

TFS5, FFS5

Screw spindles



2-pole motor rotation speed 3500 RPM								4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor		Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	NEMA		IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
TFS574/	Q_{Th}¹⁾ 291.6		-	-	-	-	-	Q_{Th}¹⁾ 145.8		-	-	-	-	-
10	280	285	6.2	7.0	8.6	11.0	123	134	139	2.9	3.4	4.55	5.5	99
20	276	283	11.0	12.1	17.3	15.0	151	130	137	5.4	6.0	8.6	7.5	130
30	272	281	15.9	17.2	21.3	22.0	161	126	135	7.8	8.5	12.6	11.0	150
40	269	279	20.7	22.2	25.3	30.0	172	123	134	10.2	11.1	12.6	15.0	150
50	266	278	25.6	27.3	33.5	30.0	295	120	132	12.6	13.7	17.3	15.0	167
60	262	276	30.5	32.4	33.5	37.0	295	117	130	15.1	16.2	17.3	18.5	167
70	260	274	35.3	37.5	41.5	45.0	320	114	129	17.5	18.8	21.3	22.0	232
80	257	273	40.2	42.6	51.0	45.0	385	111	127	19.9	21.4	25.3	22.0	237
90	254	271	45.0	47.7	51.0	55.0	385	108	126	22.3	23.9	25.3	30.0	237
100	252	270	49.9	52.7	62.0	55.0	460	105	124	24.8	26.5	34.5	30.0	310
110	249	269	54.7	57.8	62.0	75.0	460	-	123	-	29.1	34.5	30.0	310
120	247	267	59.6	62.9	86.0	75.0	585	-	122	-	31.6	34.5	37.0	310
TFS5100/	Q_{Th}¹⁾ 394.1		-	-	-	-	-	Q_{Th}¹⁾ 197		-	-	-	-	-
10	378	386	7.9	8.7	12.6	11.0	142	181	189	3.8	4.3	6.3	5.5	130
20	374	383	14.4	15.6	21.3	18.5	161	177	186	7.1	7.8	8.6	11.0	130
30	370	381	21.0	22.6	25.3	30.0	172	173	184	10.4	11.3	12.6	15.0	150
40	366	379	27.6	29.5	33.5	37.0	295	169	182	13.6	14.8	17.3	18.5	167
50	362	377	34.1	36.4	41.5	45.0	320	165	180	16.9	18.3	21.3	22.0	232
60	358	375	40.7	43.4	51.0	55.0	385	161	178	20.2	21.8	25.3	22.0	237
70	355	373	47.3	50.3	62.0	55.0	460	158	176	23.5	25.3	34.5	30.0	310
80	351	371	53.8	57.3	62.0	75.0	460	154	174	26.8	28.8	34.5	30.0	310
90	348	369	60.4	64.2	86.0	75.0	585	150	172	30.1	32.3	34.5	37.0	310
100	345	368	67.0	71.1	86.0	75.0	585	147	171	33.3	35.8	42.5	37.0	355
110	342	366	73.5	78.1	86.0	90.0	585	-	169	-	39.3	42.5	45.0	355
120	338	365	80.1	85.0	101.0	90.0	665	-	168	-	42.8	52.0	45.0	390

¹⁾ Q_{Th}: Theoretical flow rate

Viscosity > 20 mm²/s more power consumption.

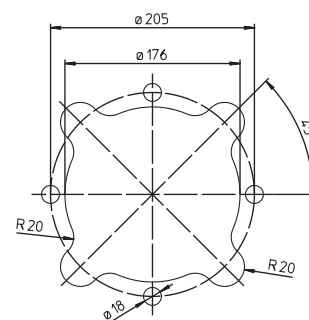
Characteristics and dimensions

TFS5, FFS5

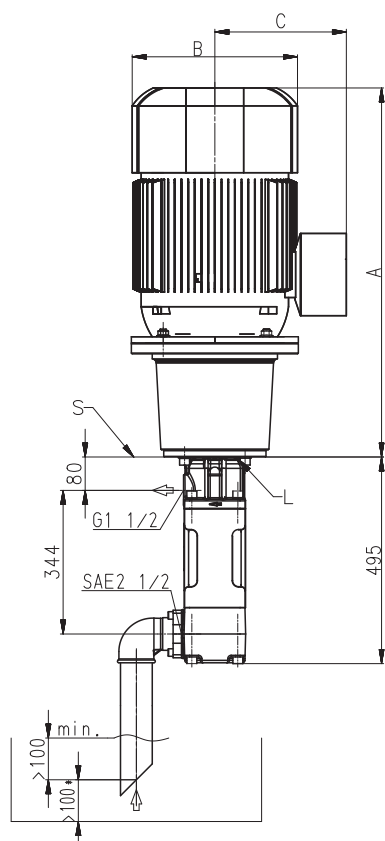
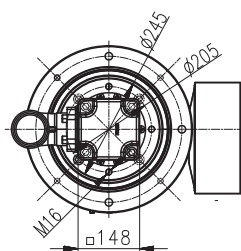
60 Hz

Mounting hole patterns

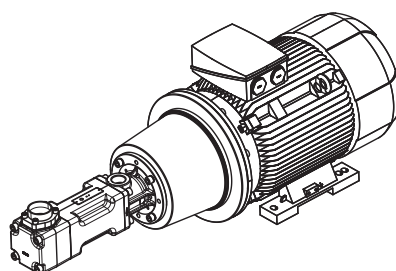
TFS5



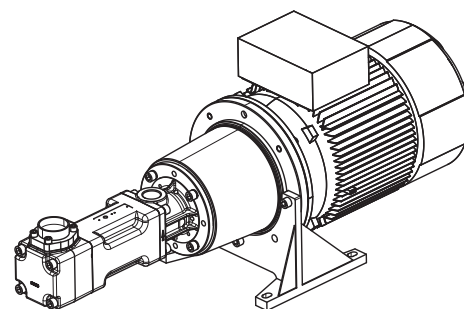
All corners must be deburred!
According to ISO 2768-m



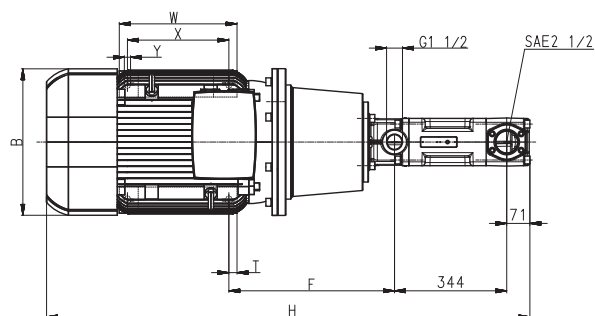
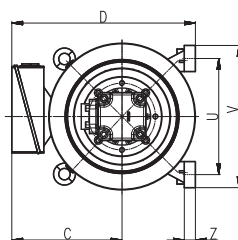
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



< 45kW



≥ 45kW



Power 2-poles kW	Power 4-poles kW	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
–	4.55	581	222	177	332	228	1076	22.5	215	250	230	185	14	15
8.6	5.5 / 6.3	672	262	202	387	222	1167	22.5	265	300	270	225	14	18
–	7.5 / 8.6	681	262	202	387	222	1176	22.5	265	300	270	225	14	18
11.0 / 12.6 / 15.0 / 17.3	11.0 / 12.6	767	314	237	472	237	1262	20	300	350	305	265	18	18
–	15.0 / 17.3	827	314	237	472	237	1322	20	300	350	305	265	18	18
–	18.5 / 21.3	831	356	286	521	237	1326	20	300	350	305	265	18	18
22.0 / 25.3	–	827	356	286	521	237	1322	20	300	350	305	265	18	18
–	22.0 / 25.3	861	356	286	521	237	1356	20	300	350	305	265	18	18
30.0 / 33.5	–	884	396	315	575	227	1379	25	350	400	350	300	18	20
37.0 / 41.5	30.0 / 34.5	909	396	315	575	227	1404	25	350	400	350	300	18	20
–	37.0 / 42.5	929	449	338	633	223	1422	25	400	450	385	335	18	20
45.0 / 51.0	45.0 / 52.0	987	449	338	563	508	1482	25	356	436	361	311	19	34
55.0 / 62.0	–	1059	497	410	660	560	1554	30	406	490	409	349	24	40
75.0 / 86.0	–	1132	551	433	713	582	1627	55.5	457	540	479	368	24	40
90.0 / 101.0	–	1243	551	433	713	582	1738	30	457	540	479	419	24	40

High Pressure Pumps

TFS5, FFS5

Screw spindles



2-pole motor rotation speed 3500 RPM								4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor		Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	NEMA		IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
TFS5120/	Q _{Th} ¹⁾ 472.9		-	-	-	-	-	Q _{Th} ¹⁾ 236.4		-	-	-	-	-
10	453	463	9.2	10.0	12.6	15.0	142	217	227	4.4	5.0	6.3	7.5	130
20	447	460	17.1	18.4	21.3	22.0	161	211	223	8.4	9.2	12.6	11.0	150
30	442	457	24.9	26.7	33.5	30.0	295	205	220	12.3	13.4	17.3	15.0	167
40	436	454	32.8	35.1	41.5	37.0	320	200	218	16.3	17.6	21.3	18.5	232
50	431	452	40.7	43.5	51.0	55.0	385	195	215	20.2	21.8	25.3	22.0	237
60	426	449	48.6	51.9	62.0	55.0	460	190	213	24.1	26.1	34.5	30.0	310
70	421	447	56.5	60.2	62.0	75.0	460	185	210	28.1	30.3	34.5	37.0	310
80	417	445	64.3	68.6	86.0	75.0	585	180	208	32.0	34.5	42.5	37.0	355
90	412	443	72.2	77.0	86.0	90.0	585	175	206	36.0	38.7	42.5	45.0	355
100	408	441	80.1	85.4	101.0	90.0	665	170	205	39.9	42.9	52.0	45.0	390
110	403	440	88.0	93.7	101.0	110.0	665	-	203	-	47.1	52.0	55.0	390
120	399	438	95.8	102.1	123.0	110.0	825	-	202	-	51.3	63.0	55.0	495
TFS5130/	Q _{Th} ¹⁾ 512.3		-	-	-	-	-	Q _{Th} ¹⁾ 256.1		-	-	-	-	-
10	491	500	9.8	11.7	17.3	15.0	151	235	243	4.8	5.4	6.3	7.5	130
20	484	495	18.4	20.3	25.3	30.0	172	228	239	9.0	9.8	12.6	11.0	150
30	477	490	26.9	29.0	33.5	37.0	295	221	234	13.3	14.2	17.3	15.0	167
40	471	486	35.5	37.6	41.5	45.0	320	215	230	17.6	18.6	25.3	22.0	237
50	465	482	44.0	46.2	51.0	55.0	385	209	225	21.8	23.0	25.3	30.0	237
60	459	477	52.5	54.8	62.0	75.0	460	203	221	26.1	27.3	34.5	30.0	310
70	454	474	61.1	63.5	86.0	75.0	585	198	217	30.4	31.7	34.5	37.0	310
80	449	470	69.6	72.1	86.0	75.0	585	193	214	34.7	36.1	42.5	37.0	355
90	444	466	78.1	80.7	86.0	90.0	585	187	210	38.9	40.5	52.0	45.0	390
100	440	463	86.7	89.3	101.0	90.0	665	182	207	43.2	44.9	52.0	55.0	390
110	-	460	-	98.0	123.0	110.0	825	-	204	-	49.3	63.0	55.0	495
120	-	457	-	106.6	123.0	110.0	825	-	201	-	53.7	63.0	55.0	495

¹⁾ Q_{Th}: Theoretical flow rate

Viscosity > 20 mm²/s more power consumption.

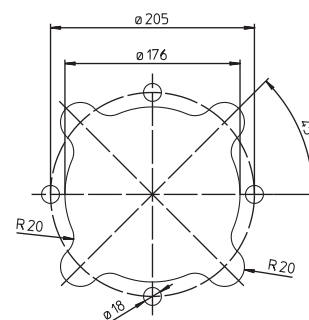
Characteristics and dimensions

TFS5, FFS5

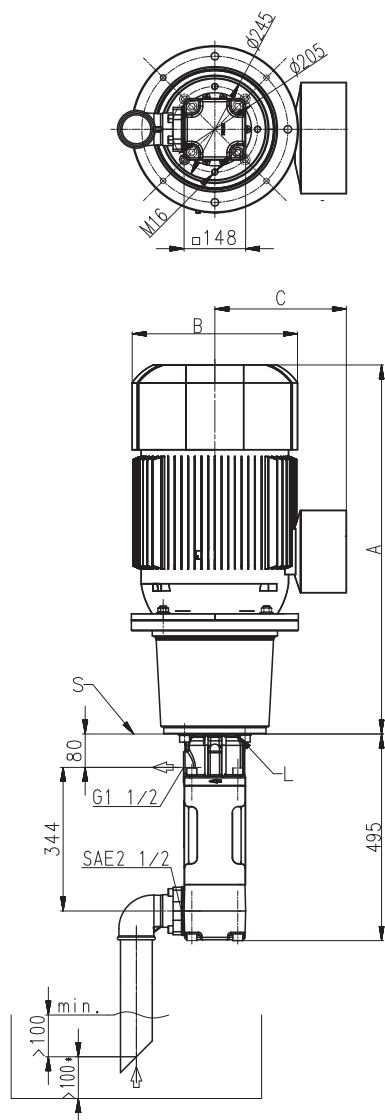
60 Hz

Mounting hole patterns

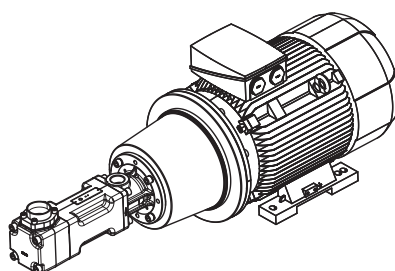
TFS5



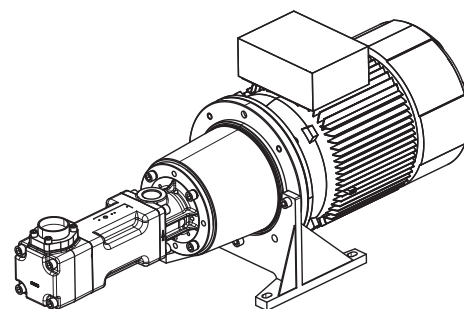
All corners must be deburred!
According to ISO 2768-m



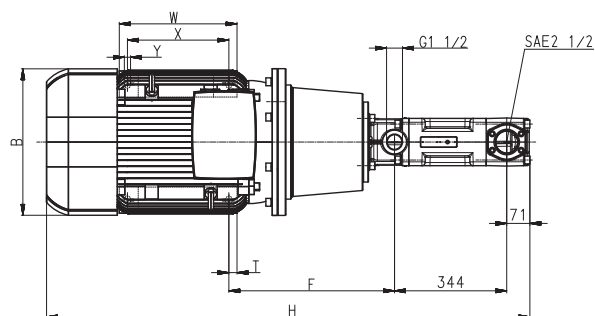
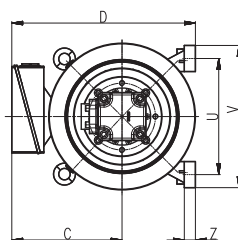
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



< 45kW



≥ 45kW



Power 2-poles kW	Power 4-poles kW	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
–	6.3	672	262	202	387	222	1167	22.5	265	300	270	225	14	18
–	7.5	681	262	202	387	222	1176	22.5	265	300	270	225	14	18
12.6 / 15.0 / 17.3	11.0 / 12.6	767	314	237	472	237	1262	20	300	350	305	265	18	18
21.3	15.0 / 17.3	827	314	237	472	237	1322	20	300	350	305	265	18	18
–	18.5 / 21.3	831	356	286	521	237	1326	20	300	350	305	265	18	18
22.0 / 25.3	–	827	356	286	521	237	1322	20	300	350	305	265	18	18
–	22.0 / 25.3	861	356	286	521	237	1356	20	300	350	305	265	18	18
30.0 / 33.5	–	884	396	315	575	227	1379	25	350	400	350	300	18	20
37.0 / 41.5	30.0 / 34.5	909	396	315	575	227	1404	25	350	400	350	300	18	20
–	37.0 / 42.5	929	449	338	633	223	1422	25	400	450	385	335	18	20
45.0 / 51.0	45.0 / 52.0	987	449	338	563	508	1482	25	356	436	361	311	19	34
55.0 / 62.0	55.0 / 63.0	1059	497	410	660	560	1554	30	406	490	409	349	24	40
75.0 / 86.0	–	1132	551	433	713	582	1627	55.5	457	540	479	368	24	40
90.0 / 101.0	–	1243	551	433	713	582	1738	30	457	540	479	419	24	40
110.0 / 123.0	–	1239	616	515	830	623	1734	35	508	610	527	406	28	50

High Pressure Pumps

TFS6, FFS6

Screw spindles



2-pole motor rotation speed 3500 RPM								4-pole motor rotation speed 1750 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor		Weight	Flow at viscosity		Power consumption at viscosity		Motor		Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	NEMA		IE3	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kW	kg
TFS690/	Q_{Th}¹⁾ 554		–	–	–	–	–	Q_{Th}¹⁾ 277		–	–	–	–	–
10	540	545	11.6	13.3	17.3	18.5	199	263	268	5.6	6.2	8.6	7.5	178
20	532	540	20.9	22.6	33.5	30.0	343	255	263	10.2	10.8	12.6	15.0	198
30	524	535	30.1	31.8	41.5	37.0	368	247	258	14.9	15.5	17.3	18.5	215
40	516	531	39.3	41.0	51.0	45.0	433	239	254	19.5	20.1	25.3	22.0	285
50	509	527	48.6	50.3	62.0	55.0	508	232	250	24.1	24.7	34.5	30.0	358
60	502	523	57.8	59.5	62.0	75.0	508	225	246	28.7	29.3	34.5	37.0	358
70	496	519	67.0	68.7	86.0	75.0	633	219	242	33.3	33.9	42.5	37.0	403
80	490	515	76.3	78.0	86.0	90.0	633	213	238	37.9	38.5	42.5	45.0	403
TFS6120/	Q_{Th}¹⁾ 739		–	–	–	–	–	Q_{Th}¹⁾ 369		–	–	–	–	–
10	720	726	14.7	16.4	21.3	22.0	209	351	357	7.2	7.8	12.6	11.0	198
20	710	721	27.0	28.7	33.5	37.0	343	341	351	13.3	13.9	17.3	18.5	215
30	701	715	39.3	41.0	51.0	45.0	433	331	346	19.5	20.1	21.3	22.0	280
40	692	710	51.6	53.3	62.0	75.0	508	322	340	25.6	26.2	34.5	30.0	358
50	683	704	64.0	65.7	86.0	75.0	633	314	335	31.8	32.4	34.5	37.0	358
60	676	699	76.3	78.0	86.0	90.0	633	306	330	37.9	38.5	42.5	45.0	403
70	668	695	88.6	90.3	101.0	110.0	713	299	325	44.1	44.7	52.0	55.0	438
80	659	689	101.0	103.0	123.0	110.0	872	290	320	50.2	50.8	63.0	55.0	543
TFS6145/	Q_{Th}¹⁾ 893		–	–	–	–	–	Q_{Th}¹⁾ 446		–	–	–	–	–
10	870	878	17.3	19.0	25.3	30.0	220	424	432	8.4	9.0	12.6	11.0	198
20	857	868	32.2	33.9	41.5	45.0	368	411	422	15.9	16.5	21.3	18.5	280
30	845	859	47.0	48.7	62.0	55.0	508	398	413	23.3	23.9	34.5	30.0	358
40	833	851	61.9	63.6	86.0	75.0	633	386	405	30.8	31.4	34.5	37.0	358
50	822	844	76.8	78.5	86.0	90.0	633	375	397	38.2	38.8	42.5	45.0	403
60	811	837	91.7	93.4	101.0	110.0	713	365	391	45.6	46.2	52.0	55.0	438
70	799	829	106.6	108.3	123.0	110.0	872	353	382	53.1	53.7	63.0	55.0	543

¹⁾ Q_{Th}: Theoretical flow rate

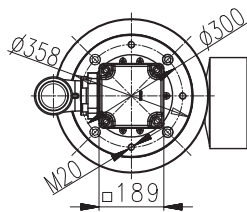
Viscosity > 20 mm²/s more power consumption.

All 6 series screw pumps with an operating flow rate of 800 l/min or above must be operated with a feed pump which supplies fluid with at least 1bar of pressure to the pump inlet.

Characteristics and dimensions

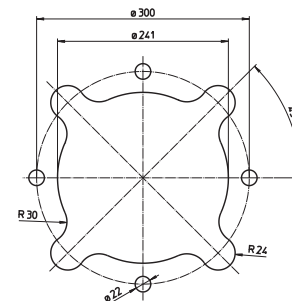
TFS6, FFS6

60 Hz

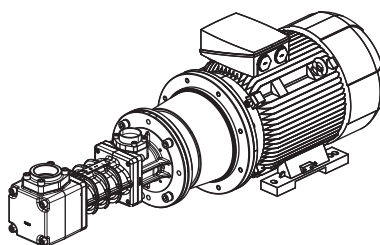
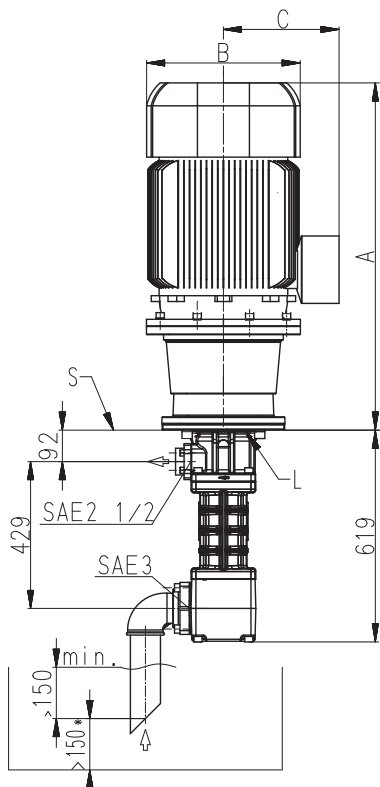


Mounting hole patterns

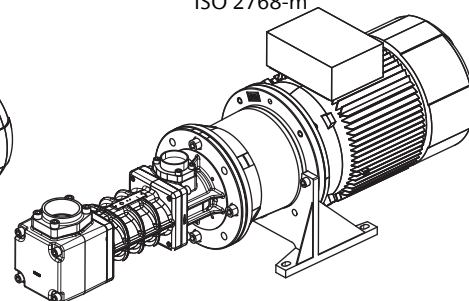
TFS6



All corners must be deburred!
According to ISO 2768-m

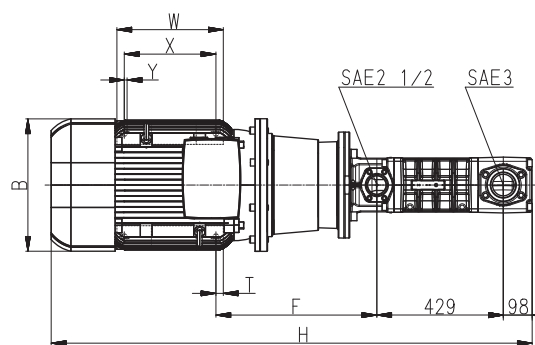
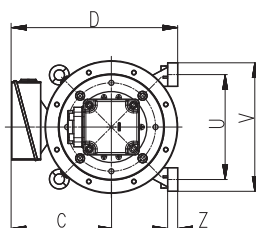


< 45kW



≥ 45kW

L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 2-poles kW	Power 4-poles kW	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
-	7.5 / 8.6	723	262	202	387	242	1342	22.5	265	300	270	225	14	18
-	11.0 / 12.6	795	314	237	472	242	1414	20	300	350	305	265	18	18
-	15.0 / 17.3	855	314	237	472	265	1474	20	300	350	305	265	18	18
17.3	-	795	314	237	497	242	1414	25	350	400	350	300	18	20
18.5 / 21.3	-	855	314	237	497	242	1474	25	350	400	350	300	18	20
-	18.5 / 21.3	859	356	286	521	265	1478	20	300	350	305	265	18	18
22.0 / 25.3	-	855	356	286	546	242	1474	25	350	400	350	300	18	20
-	22.0 / 25.3	889	356	286	521	397	1508	20	300	350	305	265	18	18
30.0 / 33.5	-	910	396	315	575	265	1529	25	350	400	350	300	18	20
-	30.0 / 34.5	935	396	315	575	417	1554	25	350	400	350	300	18	20
37.0 / 41.5	-	935	396	315	575	265	1554	25	350	400	350	300	18	20
-	37.0 / 42.5	973	449	338	633	432	1592	25	400	450	385	335	18	20
45.0 / 51.0	45.0 / 52.0	1013	449	338	563	546	1632	25	356	436	361	311	19	34
55.0 / 62.0	-	1072	497	410	660	585	1691	30	406	490	409	349	24	40
-	55.0 / 63.0	1087	497	410	660	600	1706	30	406	490	409	349	24	40
75.0	-	1160	551	433	713	622	1779	55.5	457	540	479	368	24	40
86.0 / 90.0 / 101.0	-	1270	551	433	713	622	1889	30	457	540	479	419	24	40
110.0 / 123.0	-	1242	616	515	830	638	1861	60.5	508	610	527	406	28	50

Valves

Adjustable Pressure Relief Valves

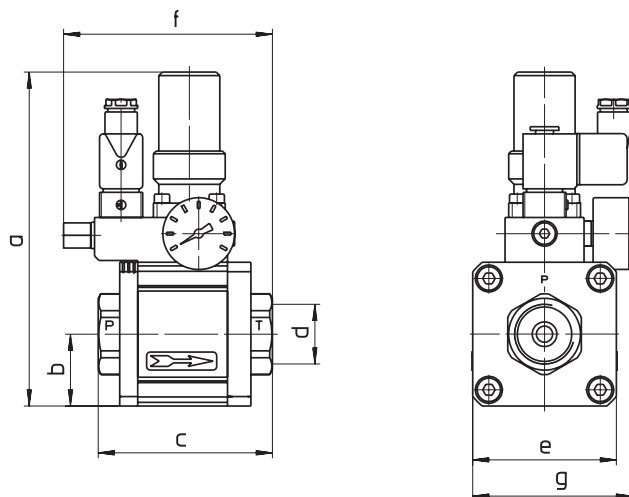
Adjustable pressure relief valves allow for variable operating pressures anywhere between 5 – 120 bar. In order to prevent overloading of the motor, however, the maximum operating pressure may never exceed the highest allowable operating pressure for the specific pump and motor combination in use.

The system user must ensure that the operating pressure never exceeds the highest allowable operating pressure (i.e. by using a second non adjustable pressure relief valve which is set for the highest allowable pressure).

3-HPB Series

The 3-HPB series are manually adjustable pressure relief valves. The valves are pneumatically operated and control the operating pressure with the control pressure in a ratio of 1:10 and 1:18.5.

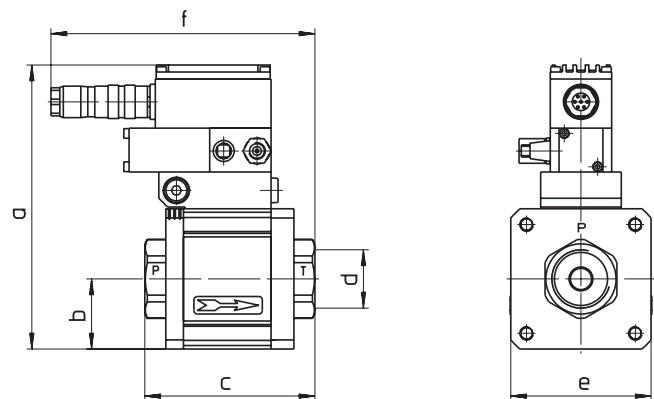
Without power and air supply the valve is fully open and in dump mode.



SPB Series

SPB Series pressure relief valves are electronically adjustable valves. The valve requires an analog signal of 0 – 10 V. The ratio between the control voltage and the operating pressure is 1:10 and 1:18.5.

Without power and air supply the valve is fully open and in dump mode.



Type	Pressure p (bar)	Flow Qmax (l/min)
3 – HPB – 08	10 – 200	18
3 – HPB – S 15	5 – 64	100
3 – HPB – H 15	5 – 120	100
3 – HPB – S 32	5 – 64	400
3 – HPB – H 32	5 – 120	240
3 – HPB – S 50	5 – 64	800

Type	Pressure p (bar)	Flow Qmax (l/min)
SPB – 08	10 – 200	18
SPB – S 15	5 – 64	100
SPB – H 15	5 – 120	100
SPB – S 32	5 – 64	400
SPB – H 32	5 – 120	240
SPB – S 50	5 – 64	800

Type 3-HPB	a mm	b mm	c mm	d mm	e mm	f mm	g mm
08	180	37	138	G ³ / ₈	Ø 74	–	–
S / H 15	186	40	97	G1	□ 80	116.3	89
S / H 32	231	60	160	G1 ¹ / ₂	□ 120	125	109
S 50	251	70	160	G1 ¹ / ₂	□ 140	–	–

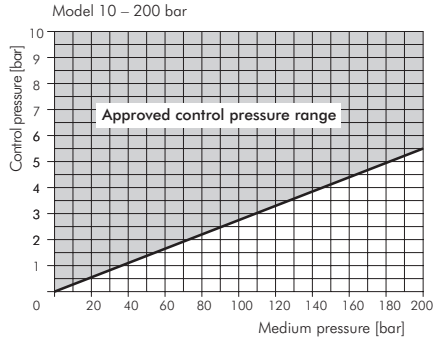
Type SPB	a mm	b mm	c mm	d mm	e mm	f mm
08	151	37	138	G ³ / ₈	Ø 74	–
S / H 15	162	40	97	G1	□ 80	150.5
S / H 32	192.5	60	160	G1 ¹ / ₂	□ 120	176.5
S 50	251	70	160	G1 ¹ / ₂	□ 140	–

Further valves on request.

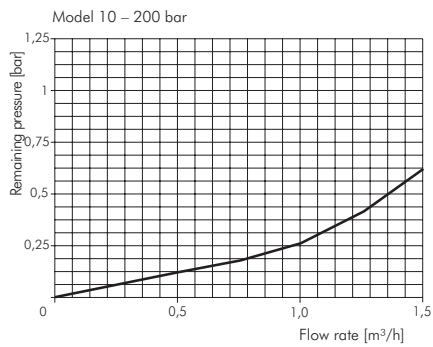
Valves

3-HPB – 08 | SPB – 08

Control pressure diagram

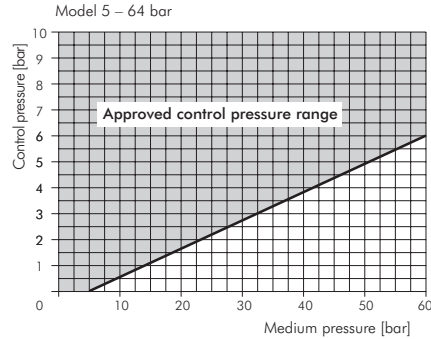


Depressurized recirculation mode

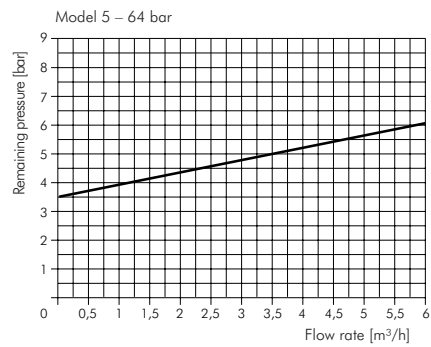


3 – HPB – S 15 | SPB – S 15

Control pressure diagram

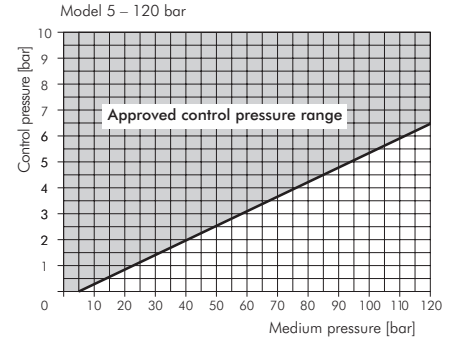


Depressurized recirculation mode

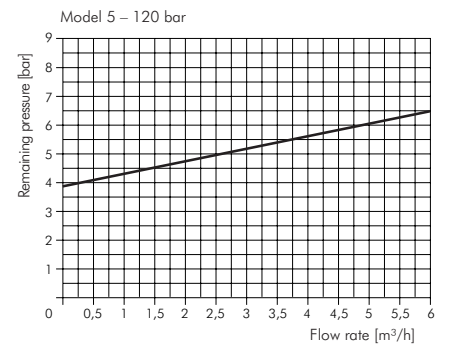


3 – HPB – H 15 | SPB – H 15

Control pressure diagram

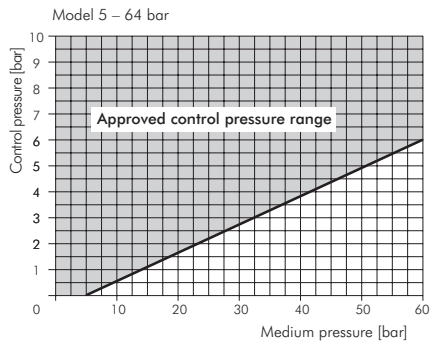


Depressurized recirculation mode

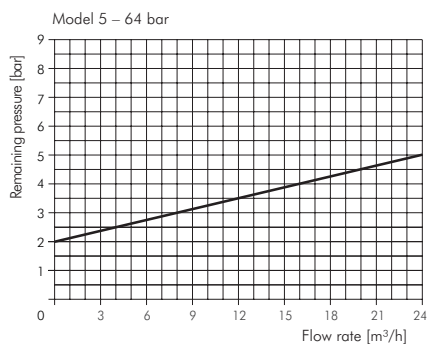


3 – HPB – S 32 | SPB – S 32

Control pressure diagram

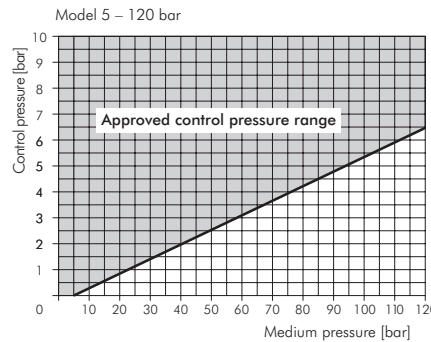


Depressurized recirculation mode

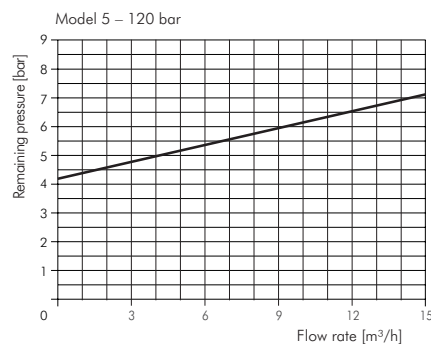


3 – HPB – H 32 | SPB – H 32

Control pressure diagram

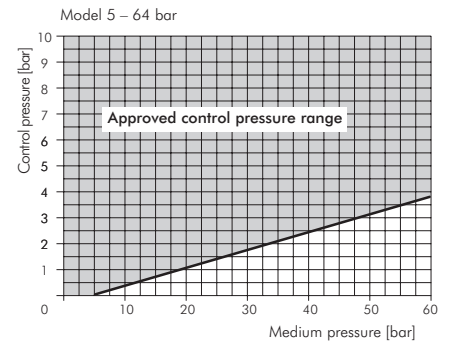


Depressurized recirculation mode

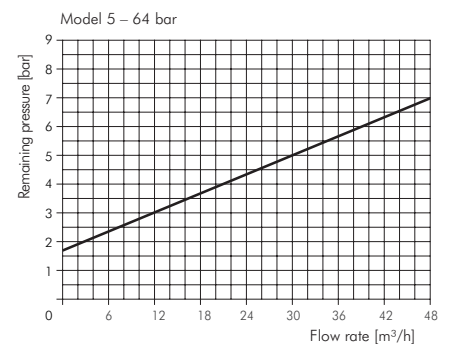


3 – HPB – S 50 | SPB – S 50

Control pressure diagram



Depressurized recirculation mode



Valves

Non-adjustable Pressure Relief Valves

Screw spindle pumps are positive displacement pumps which always require the installation of a pressure relief valve in order to prevent bursting. Pressure relief valves are set for a maximum operating pressure and protect the pump motor from overloading. Once the set maximum pressure is reached, the relief valve opens and the excess flow rate is passed through the valve back into the tank. In order to avoid pressure spikes in the system a pressure relief valve which cushions against vibration is recommended.

BBV/HBV series are such relief valves. They are available in 10 bar increments and are preset by the factory for the highest allowable operating pressure for the specific pump and motor combination.

Non-adjustable Pressure Relief Valves BBV/HBV

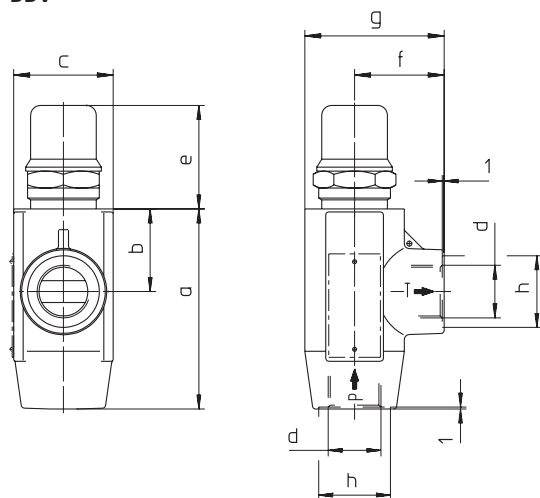
Non-adjustable Pressure Relief valves of the series BBV and HBV are shock absorbent valves which open at a preset pressure.

The relief valve opens at the factory set pressure which is available in 10 bar increments and the excess flow rate is diverted through a separate bypass line back into the tank.

Type of Pumps	Type of Valves	Pressure (bar)														
		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
BFS1, FFS1 BFS232, FFS232	BBV1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BFS2, FFS2	BBV2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BFS1-H, BFS2-H	HBV2	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—
TFS2, FFS3	BBV3	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TFS3-H	HBV3	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—

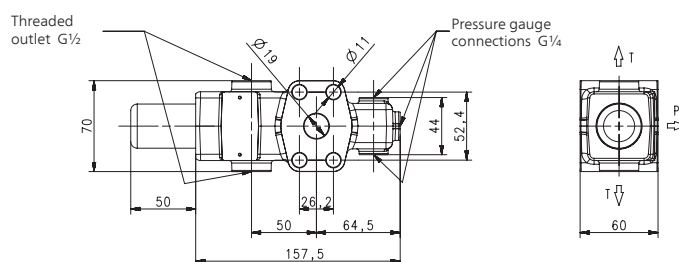
Ordering description: e.g. BBV 3 / 50

BBV

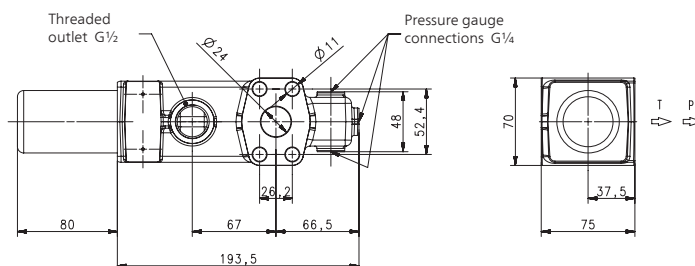


	BBV 1 + 2 mm	BBV 3 mm
a	100.5	130
b	41.5	53
c	50	65
d	G 3/4	G1
e	52	81
f	45	49
g	70	81.5
h	36	42

HBV 1+2



HBV 3



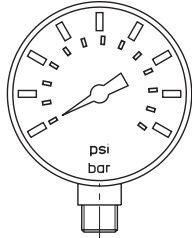
Additional relief valve characteristics upon request. The actual opening pressure may deviate from the nominal pressure setting of the valve because of the tension of the loaded spring rate.

Above mentioned pressure relief valves BBV are available upon request in a adjustable version.

The system user must ensure that the operating pressure never exceeds the highest allowable operating pressure (i.e. by using a second non adjustable pressure relief valve which is set for the highest allowable pressure).

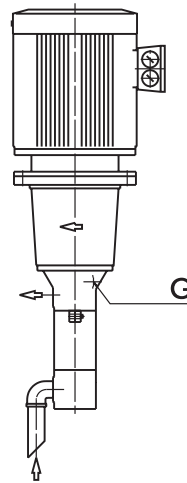
Pressure gauge / Suction protection G4 Version

Pressure gauge



Type	Pressure p (bar)
M 60	0 – 60
M 100	0 – 100
M 160	0 – 160

G4 Version

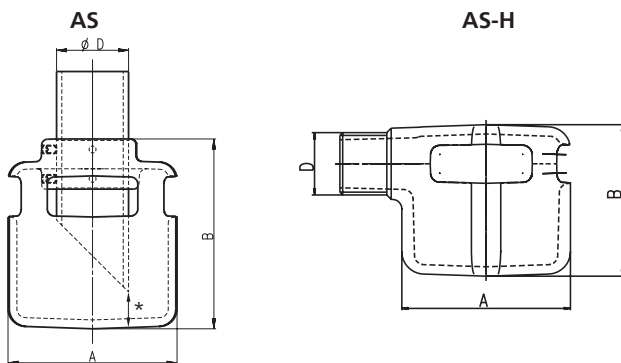


G $\frac{1}{8}$ BFS/FFS 1, 2
G $\frac{1}{4}$ TFS/FFS 3, 4, 5

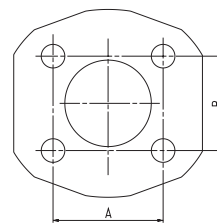
Depressurized leakage return to tank

Suction protection

The patented suction protection prevents large particles (and foreign objects) from entering the screw pump's suction.



SAE flange



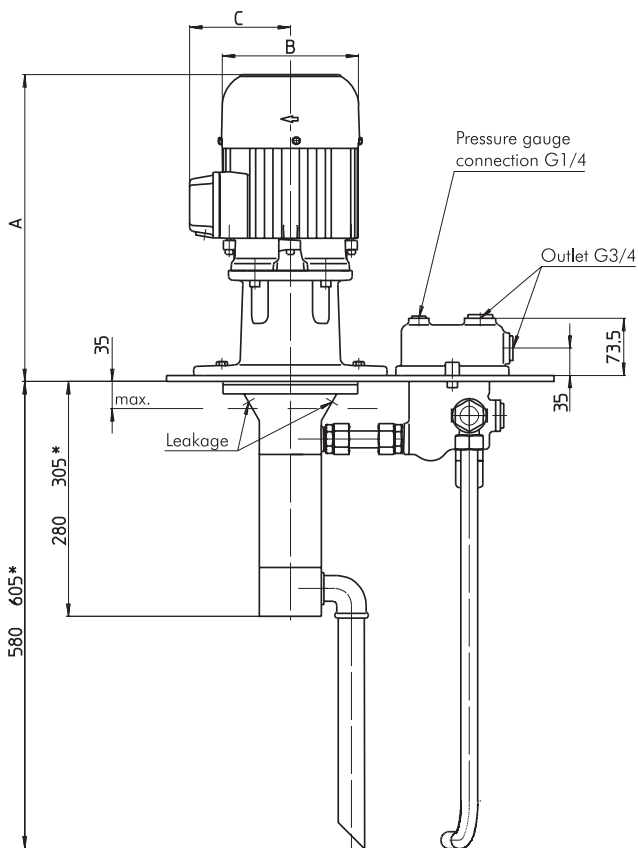
* Minimum distance $\frac{1}{3}$ D

Type	Type of Pumps	A mm	B mm	\varnothing D
AS1-2	BFS1, BFS2	90	94	1"
AS3	TFS3	115	129	1½"
AS4	TFS4	150	175	2"
AS5	TFS5	195	190	2½"
AS1-2-H	BFS1, BFS2	90	80	1"
AS3H	TFS3	115	115	G1½
AS4H	TFS4	153	175	G2
AS5H	TFS5	194	190	G2½

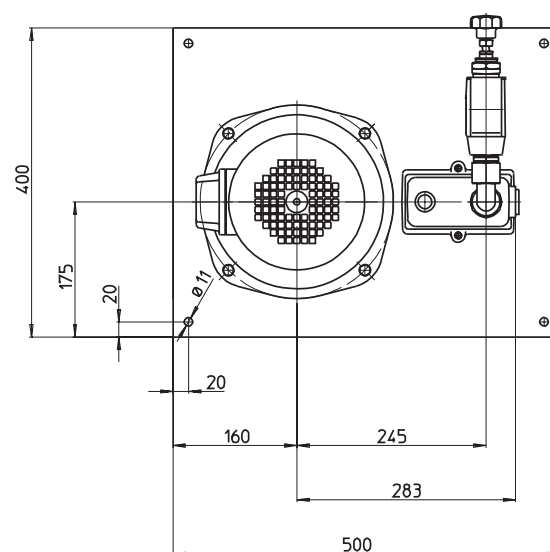
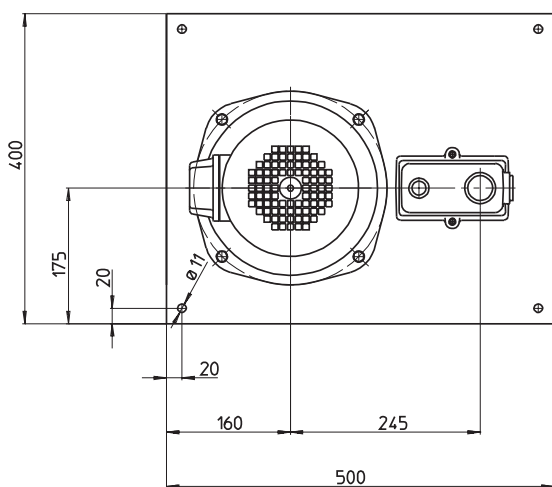
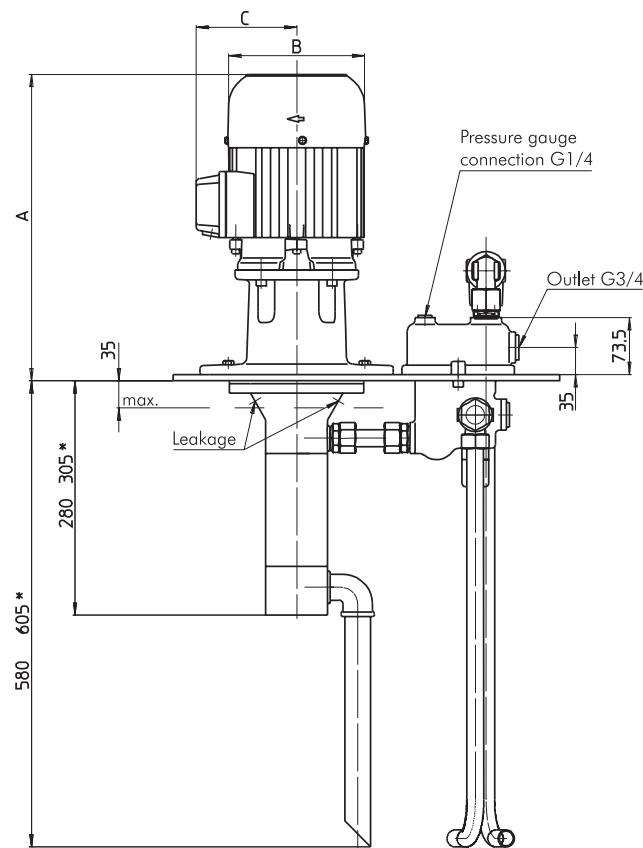
Type	Type of Pumps	A mm	B mm
SAE 2 ½	TFS5, FFS5	88.9	50.8
SAE 3	TFS6, FFS6	120.6	69.8

Pump system, fully assembled

- Series **BFS1** and **BFS2**, non-adjustable pressure relief valve:
Screw pump with mounting plate, integrated connection block and piping fully assembled.
The non-adjustable pressure relief valve is integrated into the connection block.



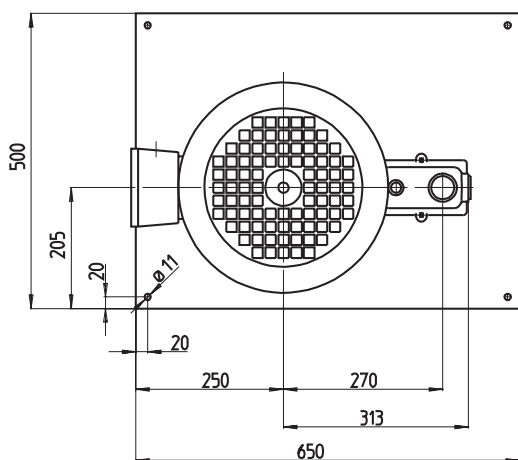
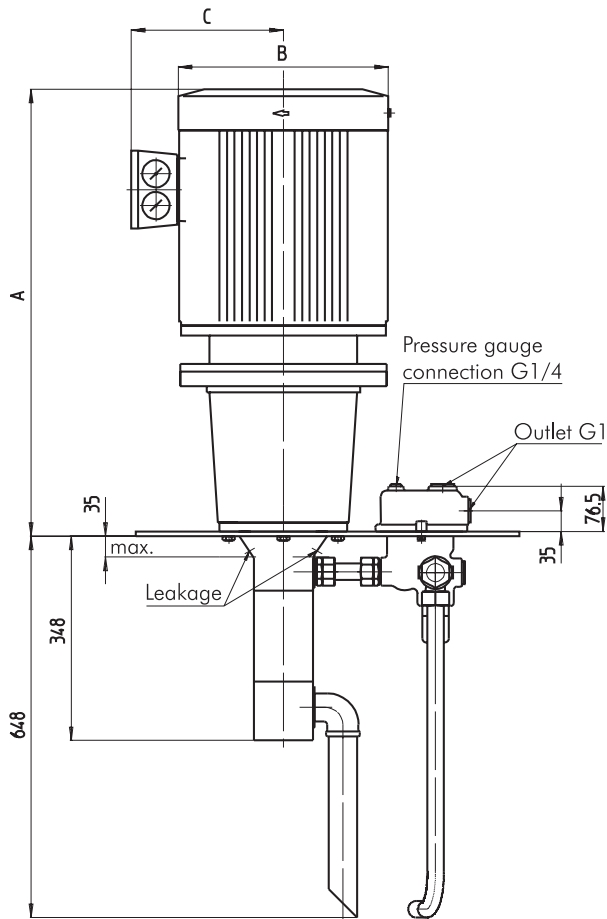
- Series **BFS1** and **BFS2**, adjustable pressure relief valve:
Screw pump with mounting plate, integrated connection block and piping fully assembled.
The non-adjustable pressure relief valve is integrated into the connection block.
The adjustable pressure relief valve is mounted above the plate.



*) Dimensions for BFS2
Dimensions A + 8 mm mounting plate

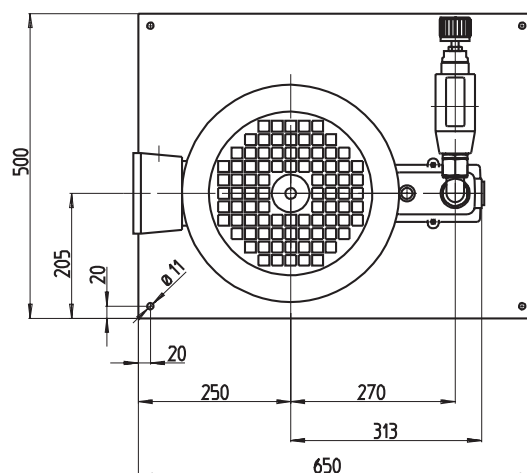
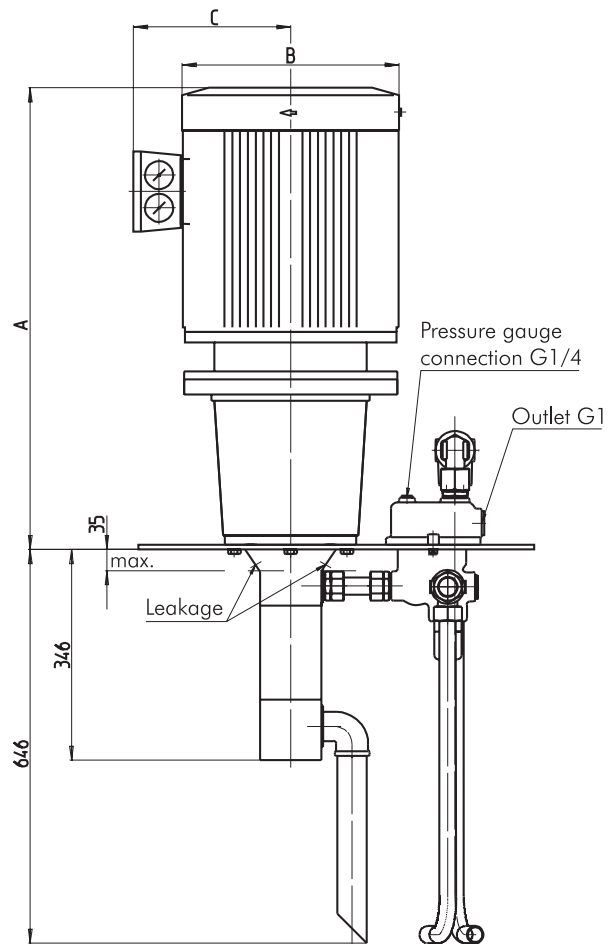
*) Dimensions for BFS2
Dimensions A + 8 mm mounting plate

3. Series TFS3, non adjustable pressure relief valve:
Screw pump with mounting plate, integrated connection block and piping fully assembled.
The non-adjustable pressure relief valve is integrated into the connection block.



Dimensions A + 8 mm mounting plate

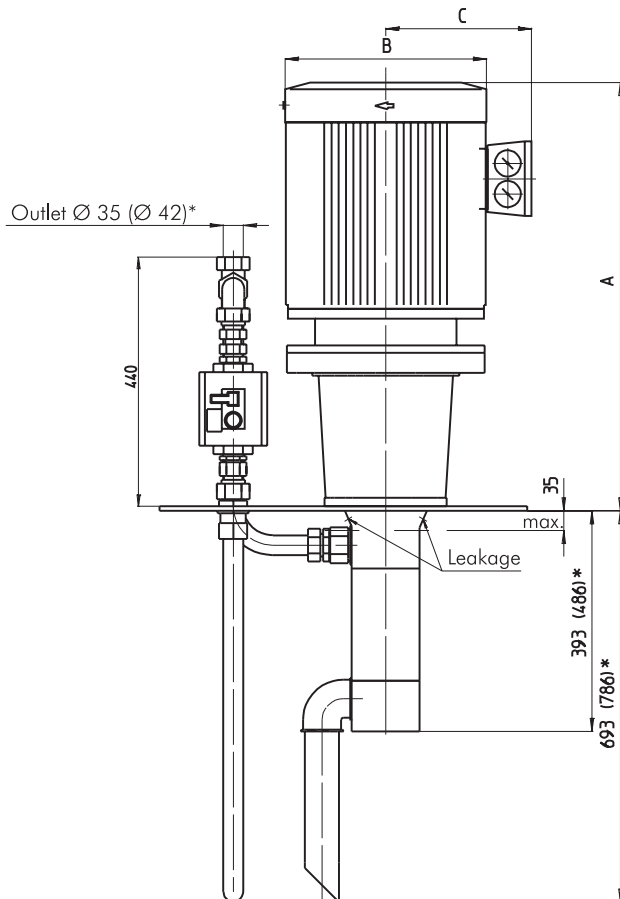
4. Series TFS3, adjustable pressure relief valve:
Screw pump with mounting plate, integrated connection block and piping fully assembled.
The non-adjustable pressure relief valve is integrated into the connection block.
The adjustable pressure relief valve is mounted above the plate.



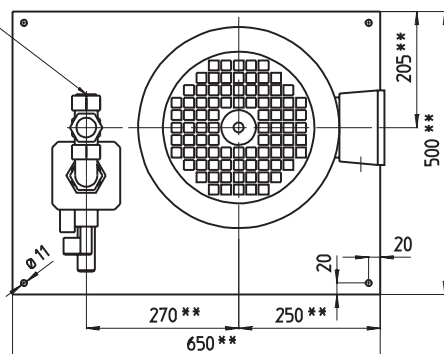
Dimensions A + 8 mm mounting plate

Pump system, fully assembled

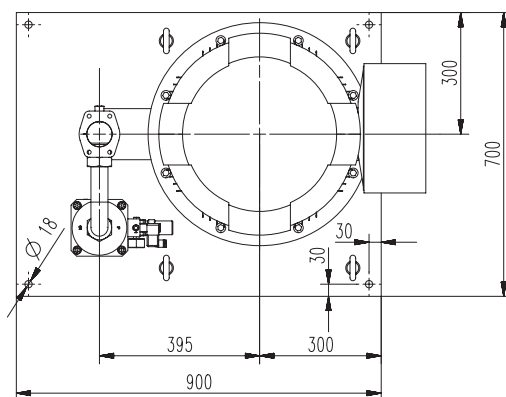
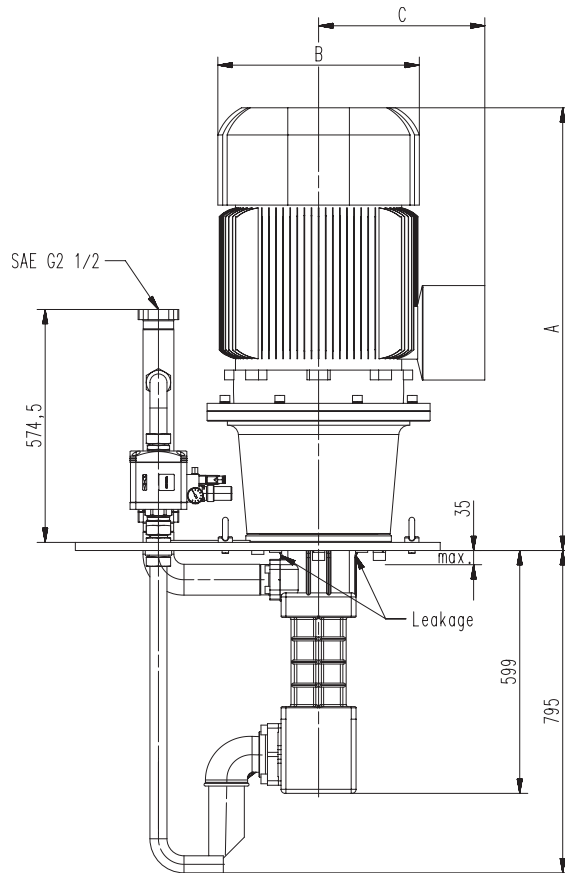
5. Series TFS4 and TFS5, adjustable pressure relief valve (pneumatically operated):
Screw pump with mounting plate, adjustable pressure relief valve (pneumatically operated) and piping fully assembled.
The adjustable pressure relief valve is mounted above the plate.



Pressure gauge connection possible



6. Series TFS6, adjustable pressure relief valve:
Screw pump with mounting plate, adjustable pressure relief valve (pneumatically operated) and piping fully assembled.
The adjustable pressure relief valve is mounted above the plate.



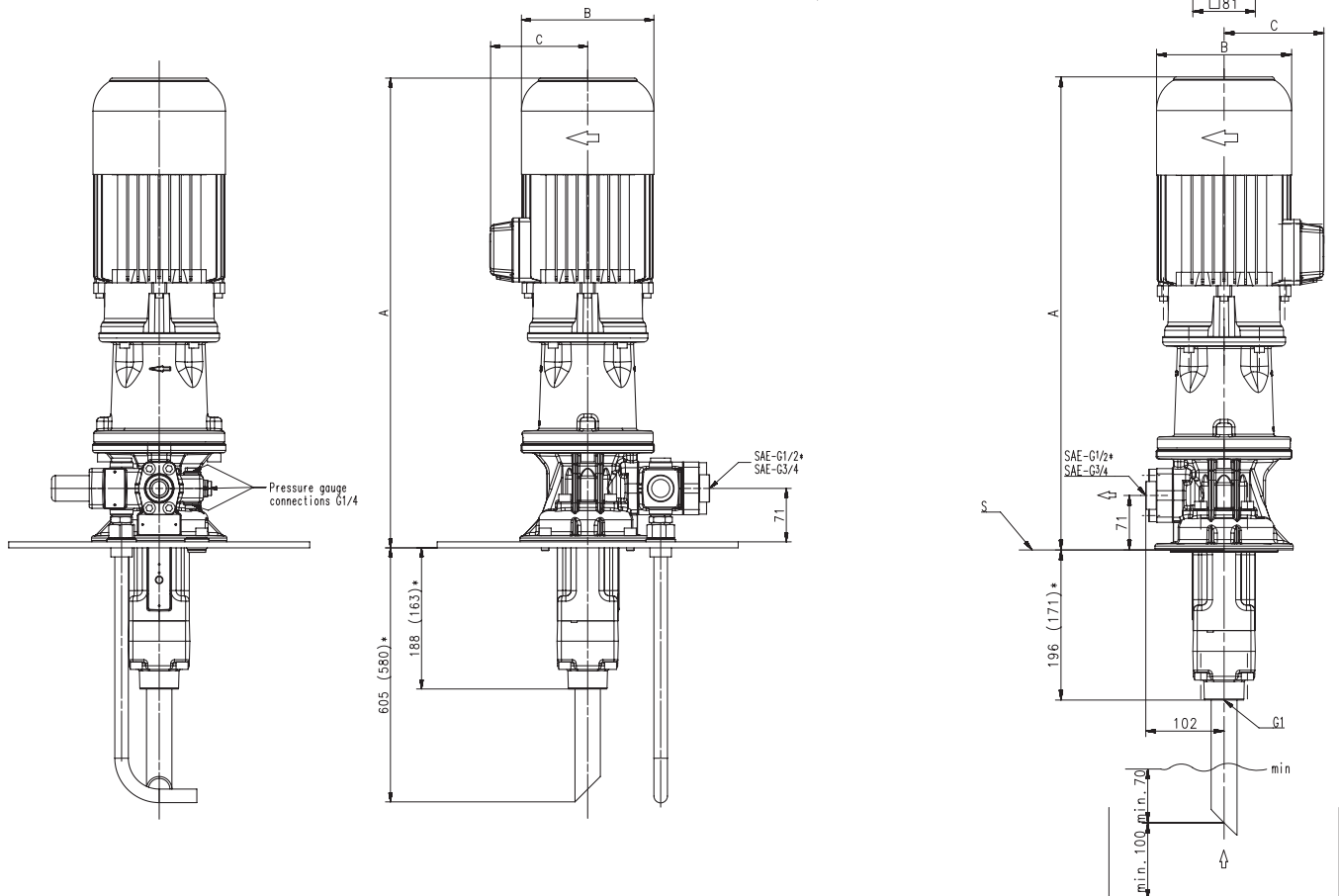
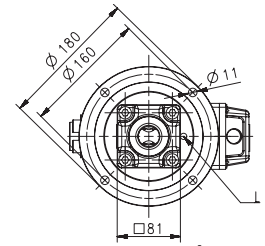
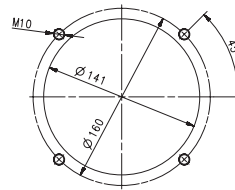
*) Dimensions for TFS5

**) Dimensions for motors larger than 37 kW upon request
Dimensions A + 12 mm mounting plate

Pump system, fully assembled

7. Series **BFS1-H / BFS2-H**, non-adjustable pressure relief valve: Screw pump with integrated connection block, fully assembled.
The non-adjustable pressure relief valve is integrated into the connection block.

Mounting hole patterns



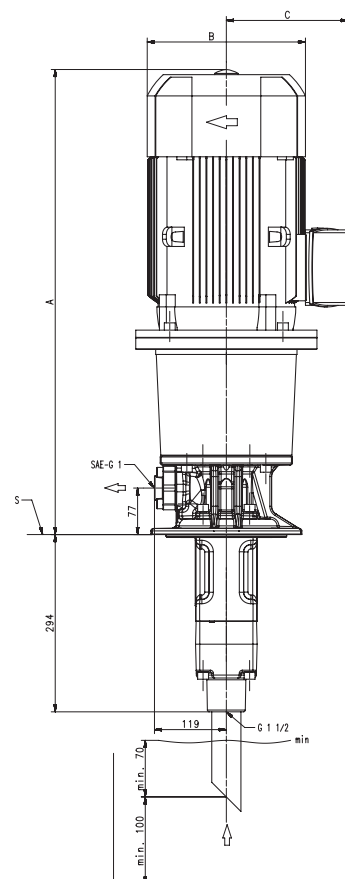
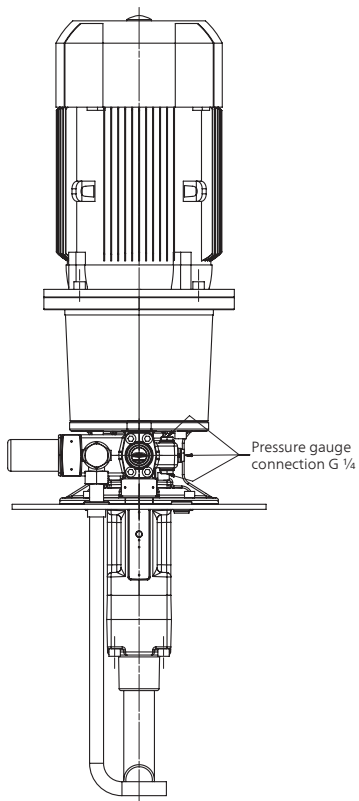
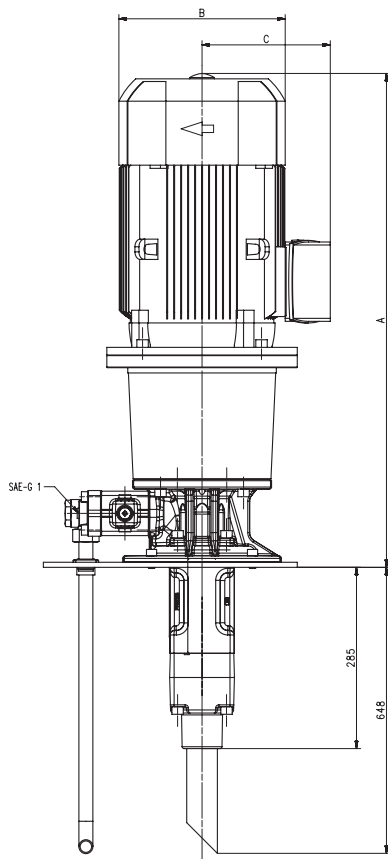
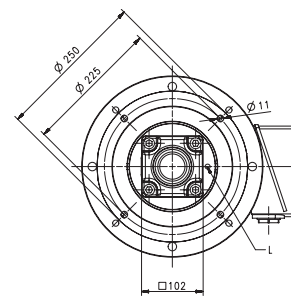
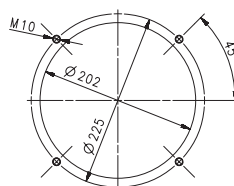
* = BFS1-H
L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole
Dimensions for standard motor upon request

Power 50 Hz 2-poles kW	BFS1-H			BFS2-H			Power 60 Hz 2-poles kW	BFS1-H			BFS2-H		
	A mm	B mm	C mm	A mm	B mm	C mm		A mm	B mm	C mm	A mm	B mm	C mm
B 1.3 / 1.5	558	176	130	558	176	130	B 1.49 / 1.75	558	176	130	558	176	130
B 1.7	584	176	130	584	176	130	B 2.18 / 2.55 / 2.94	617	176	130	617	176	130
B 1.9 / 2.2 / 2.6	617	176	130	617	176	130	B 3.45 / 3.8 / 4.55	656	218	150	656	218	150
B 3.3 / 4.0	656	218	150	656	218	150	B 5.75 / 6.3	686	218	150	686	218	150
B 5.0 / 5.5	686	218	150	686	218	150	B 8.6	765	258	193	765	258	193
B 7.5	765	258	193	765	258	193	B 10.3				765	258	193
B 9.0				765	258	193	B 12.6 / 15.0				773	310	240
B 11.0 / 13.0				773	310	240							

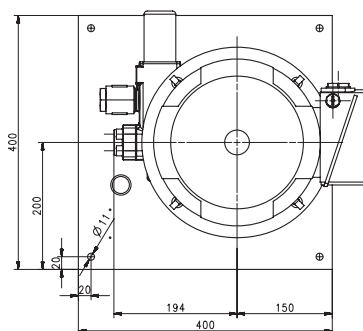
Pump system, fully assembled

8. Series TFS3-H, non-adjustable pressure relief valve: Screw pump with integrated connection block, fully assembled.
The non-adjustable pressure relief valve is integrated into the connection block.

Mounting hole patterns



L = Leakage hole
S = Mounting plate, please refer to the cut-out of mounting hole



Power 50 Hz 2-poles kW	TFS3-H		
	A mm	B mm	C mm
2.2	647	178	126
3.0	699	198	166
4.0	682	222	177
5.5	726	262	202
7.5	776	262	202
11.0 / 15.0	895	314	237
18.5	955	314	237
22.0	955	356	286
30.0	1012	396	315

Power 60 Hz 2-poles kW	TFS3-H		
	A mm	B mm	C mm
2.54		178	126
3.0	699	198	166
3.7 / 4.55	682	222	177
5.5 / 6.3	726	262	202
7.5 / 8.6	776	262	202
11.0 / 12.6 / 15.0 / 17.3	895	314	237
18.5 / 21.3	955	314	237
22.0 / 25.3	955	356	286
30.0 / 33.5	1012	396	315
37.0 / 41.5	1037	396	315

Questionnaire

Fax	+49 2392 5006-180	Date	
E-Mail	sales@brinkmannpumps.de		

Contact details	
Company	
Address	
Contact partner	
Telephone	
E-Mail	

Pump	
Requirement per year (each)	

Field of application		
Type	Materials	Specific abrasion
<input type="checkbox"/> grinding Al oxid	<input type="checkbox"/> cast iron	<input type="checkbox"/> tinder
<input type="checkbox"/> grinding CBN	<input type="checkbox"/> brass	<input type="checkbox"/> diamond
<input type="checkbox"/> drilling	<input type="checkbox"/> Al	<input type="checkbox"/> silicon carbide
<input type="checkbox"/> turning	<input type="checkbox"/> steel	
<input type="checkbox"/> milling		
<input type="checkbox"/> other:	<input type="checkbox"/> other:	<input type="checkbox"/> other:

Pumping data	
Flow rate (l/min.)	
Pressure (bar)	

Dimensions	
Immersion depth	

Medium to be pumped	
Coolants	<input type="checkbox"/>
Oils	<input type="checkbox"/>
Temperature (°C)	
Viscosity at pumping temperature (mm ² /s, cSt)	
Density (kg/l)	
pH value	
Air in medium	<input type="checkbox"/> yes <input type="checkbox"/> no
Lubricity in medium	<input type="checkbox"/> yes <input type="checkbox"/> no

Filtration	
Filtration (µm)	
Filter type	
ppm levels acc. to ISO 4406	
Percentage of solids by weight (mg/l)	

Drive			
laid out for line power	<input type="checkbox"/> 3 x 400 V, 50 Hz	<input type="checkbox"/> 3 x 440 V, 60 Hz	<input type="checkbox"/> 3 x 208-230 V, 60 Hz
	<input type="checkbox"/> 3 x 415 V, 50 Hz	<input type="checkbox"/> 3 x 460 V, 60 Hz	<input type="checkbox"/> 3 x 200-220 V, 60 Hz
	<input type="checkbox"/> 3 x 380 V, 50 Hz	<input type="checkbox"/> 3 x 480 V, 60 Hz	<input type="checkbox"/> other:
	<input type="checkbox"/> 3 x 200 V, 50 Hz	<input type="checkbox"/> 3 x 380 V, 60 Hz	
		<input type="checkbox"/> 3 x 400 V, 60 Hz	

Motor	
Protective system IP55	
Insulation class (F)	
Ambient temperature (°C)	
Frequency control (Hz)	from to
Switch-on operations (per min)	
Motor connection plug HAN	<input type="checkbox"/> yes

Other	

The combination of state of the art production equipment, along with lean manufacturing processes and a highly skilled and motivated workforce allows for the highest flexibility and availability of parts at the manufacturing site in Werdohl, Germany. The US subsidiary located in Wixom, Michigan was founded in 1997 and the Japanese subsidiary in Kanagawa near Tokyo opened its doors in 2008.



Production



It has always been a core philosophy of BRINKMANN PUMPS to be able to provide the highest level of service worldwide. In order to achieve this goal, all BRINKMANN PUMPS employees globally go through rigorous training programs focusing on various areas, such as, pump applications, proper selection, consulting, service and repair.



「The Brinkmann Pumps network – This is the way to find us.」



BRINKMANN PUMPS has a global presence and direct representation throughout Europe, Asia and North America. This ensures quick response times, competent consulting personnel and the highest level of service, which Brinkmann Pumps is known for, anytime and anywhere. Visit our website – where you will find all the contact details for our representative offices. Visit us and convince yourself of our capabilities.

Welcome to BRINKMANN PUMPS.



BRINKMANN PUMPS

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