

2014

## 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.

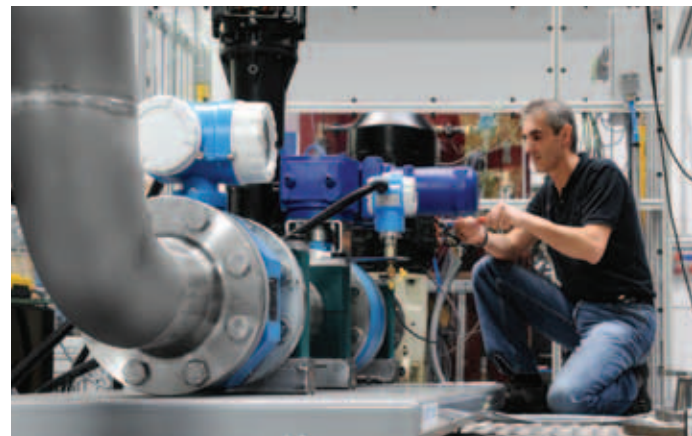
From a small centrifugal coolant pump for external cooling to the rugged lifting and cutter pumps to the high pressure screw spindle pumps, BRINKMANN PUMPS is the only supplier to cover all your coolant pump needs. Performance and reliability of our pumps over many decades has machine tool designers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





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<b>High Pressure Pumps</b>	<b>Screw spindles</b>	<b>50 Hz</b>	
High Pressure Pumps BFS1   FFS1, 50 Hz BFS2   FFS2, 50 Hz	Screw spindles <b>High pressure</b> 2.6 ... 25.4 l/min 10 ... 150 bar		14 – 15
High Pressure Pumps BFS2   FFS2, 50 Hz	Screw spindles <b>High pressure</b> 7 ... 47.4 l/min 10 ... 150 bar		16 – 17
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High Pressure Pumps TFS4   FFS4, 50 Hz	Screw spindles <b>High pressure</b> 32 ... 194 l/min 10 ... 120 bar		20 – 21
High Pressure Pumps TFS5   FFS5, 50 Hz	Screw spindles <b>High pressure</b> 80 ... 412 l/min 10 ... 120 bar		22 – 25
High Pressure Pumps TFS6   FFS6, 50 Hz	Screw spindles <b>High pressure</b> 165 ... 725 l/min 10 ... 80 bar		26 – 27



<b>High Pressure Pumps</b>	<b>Screw spindles</b>	<b>60 Hz</b>	
High Pressure Pumps BFS1   FFS1, 60 Hz BFS2   FFS2, 60 Hz	Screw spindles <b>High pressure</b> 3.2 ... 30.8 l/min 10 ... 150 bar		28 – 29
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High Pressure Pumps TFS3   FFS3, 60 Hz	Screw spindles <b>High pressure</b> 22.8 ... 119.5 l/min 10 ... 150 bar		32 – 33
High Pressure Pumps TFS4   FFS4, 60 Hz	Screw spindles <b>High pressure</b> 45 ... 235 l/min 10 ... 120 bar		34 – 35
High Pressure Pumps TFS5   FFS5, 60 Hz	Screw spindles <b>High pressure</b> 105 ... 500 l/min 10 ... 120 bar		36 – 39
High Pressure Pumps TFS6   FFS6, 60 Hz	Screw spindles <b>High pressure</b> 213 ... 878 l/min 10 ... 80 bar		40 – 41



## Electrical Features

### Motors acc. to EN 60034

Protective system	IP55
Insulation class	F
Number of poles	2
Efficiencies	EN 60034-30, IE2 ≥ 0.75 kW

	50 Hz		60 Hz	
	220 V – 240 V Δ 380 V – 420 V Y	380 V – 420 V Δ	265 V Δ 460 V Y	460 V Δ
up to 5.5 kW	Standard	●	●	●
7.5 kW – 10 kW	●	Standard	●	●
as of 11 kW	–	Standard	–	●

The voltage tolerance is ± 5 % in keeping with DIN EN 60034-1.

Special voltages are available upon request:

	200 V	380 V	400 V	415 V	440 V	480 V	500 V	575 V	230 V Y Y 460 V Y
50 Hz	●	●	●	●	–	–	●	–	–
60 Hz	●	●	●	–	●	●	–	●	●

- available
- not available

Other voltages upon request.

Motor sizes of 10 kW are delivered with thermistors as standard.

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

### 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
Standard efficiency	IE1	–	–
Below standard efficiency	–	–	–

IE = International Efficiency

### Motors as of 7.5 kW

Motor design permits Y/Δ-starting.

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

### 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 10 kW ► maximum 20 times per hour.

Motors 11 kW and higher ► maximum 15 times per hour.

Alternative starting frequency is possible upon request.

### Non-European Regulations

Brinkmann Motors up to 10 kW and up to max. 600 V are available as special designs with cUL-certification.

Approval testing is carried out by the Underwriters Laboratories Inc. according to the UL 1004 Electric Motors Standard. The motor's rating plate bears the identification:



„Recognized Component Mark for Canada and the United States“.

Motors larger than 10 kW are available upon request with approval testing.

Brinkmann motors ranging from 2.3 kW to 10 kW are available with the China Energy Label, GB18613-2012, Grade 3 on request.

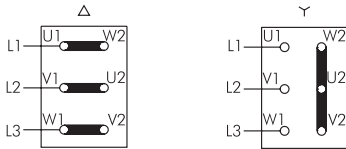
Additional country-specific approvals upon request.

## Electrical Features

### Circuits

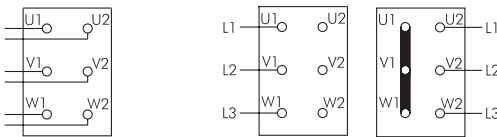
**Standard voltage changing**  $\Upsilon / \Delta$   
e. g. 220 – 240 V / 380 – 420 V, 50 Hz

$\Delta$  (Delta Connection)      $\Upsilon$  (Star Connection)



### Optional

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



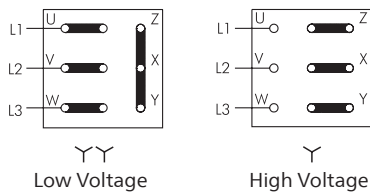
Dahlander circ.

(1500 RPM)     (3000 RPM)

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

4-poles  $\Upsilon$      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

DESINA includes a complete concept for standardization and decentralization of the electronic and fluid technical installation of machine tool OEMs, the automotive industry and its suppliers.

The specifications for the required components were defined in cooperation between the machine construction, automotive and supplier industry.

DESINA considers proven solutions such as open bus systems, industrial standards for connectors, etc.

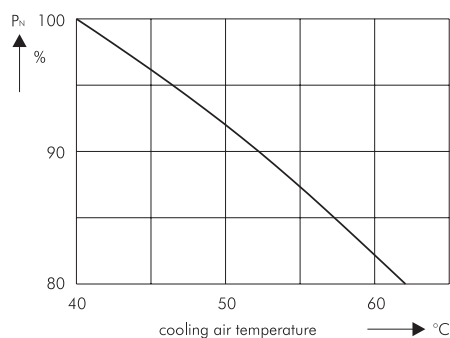
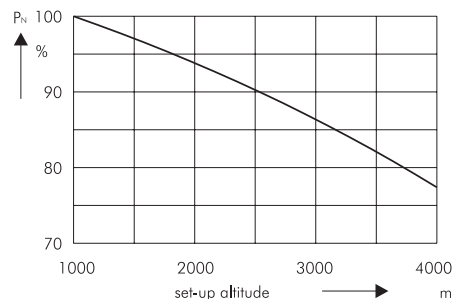
By standardizing components, interfaces and connection elements it is possible to realize highly varying field bus systems on a common physical basis.

Motors up to 5.5 kW are available with HAN 10-pin connector; motors 7.5 kW and 10 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





### Technical motor data

Three-phase induction motor 2 pole, thermal protection class F, grade of protection IP 55, IE2

### Brinkmann motors IE2

Power 50 Hz / 60 Hz kW	Rated current 2 pole 50 Hz A		Noise level max. dBA / 50 Hz	Rated current 2 pole 60 Hz A		Noise level max. dBA / 60 Hz
	Y 380 V – 420 V	Δ 380 V – 420 V		Y 460 V	Δ 460 V	
B 1.3 / 1.5	3.0	–	63	3.0	–	67
B 1.5 / 1.75	3.8	–	63	3.8	–	67
B 1.7 / 1.95	4.1	–	63	4.1	–	67
B 1.9 / 2.2	4.9	–	63	4.9	–	67
B 2.2 / 2.55	5.3	–	63	5.3	–	67
B 2.6 / 3.0	6.3	–	63	6.3	–	67
B 3.3 / 3.8	8.0	–	71	8.0	–	75
B 4.0 / 4.6	9.5	–	71	9.5	–	75
B 5.0 / 5.75	12.0	–	71	12.0	–	75
B 5.5 / 6.3	12.5	–	74	12.5	–	78
B 7.5 / 8.6	–	17.0	74	–	17.0	78
B 10.0 / 11.5	–	23.0	74	–	23.0	78

### Standard motors IE2

Power 50 Hz / 60 Hz kW	Rated current 2 pole 50 Hz A	Noise level dBA / 50 Hz	Rated current 2 pole 60 Hz A	Noise level dBA / 60 Hz	Rated current 4 pole 50 Hz A	Noise level dBA / 50 Hz	Rated current 4 pole 60 Hz A	Noise level dBA / 60 Hz
	Y 400 V		Y 460 V		Y 400 V		Y 460 V	
0.75 / 0.86	1.71	60	1.65	64	1.8	52	1.7	56
1.1 / 1.3*	2.25	60	2.15	64	2.5	56	2.4	60
1.5 / 1.75	3.2	66	3.1	70	3.3	56	3.3	60
2.2 / 2.55	4.5	66	4.4	70	4.6	56	4.5	60
3.0 / 3.45	6.1	67	5.8	71	6.2	56	6.0	60
4.0 / 4.6*	7.8	67	7.5	71	8.2	59	8.0	63
5.5 / 6.3	10.5	72	10.2	76	11.3	62	10.9	66
	Δ 400 V		Δ 460 V		Δ 400 V		Δ 460 V	
7.5 / 8.6	14.1	72	13.7	75	14.7	62	14.5	66
11.0 / 12.6	20.5	75	20.5	>75	21.0	66	20.5	70
15.0 / 17.3	27.0	75	27.0	>75	28.0	66	27.5	70
18.5 / 21.3	33.5	75	33.5	>75	35.0	66	34.0	70
22.0 / 25.3	39.0	75	39.0	>75	41.5	66	40.5	70
30.0 / 33.5*	54.0	>75	53.0	>75	56.0	67	55.0	71
37.0 / 41.5*	66.0	>75	64.0	>75	65.0	68	65.0	72
45.0 / 51.0*	79.0	>75	78.0	>75	80.0	68	80.0	72
55.0 / 62.0*	96.0	>75	94.0	>75	100.0	68	99.0	72
75.0 / 84.0	133.0	>75	128.0	>75				
90.0 / 101.0	157.0	>75	151.0	>75				
110.0 / 123.0	187.0	>75	182.0	>75				

Noise level with +3 dBA tolerance for standard motors.

**Special voltages and cycles are available upon request.** Depending on actual motor rating and sizing deviations in pump and motor configurations are possible. Motors from various suppliers will be used, depending on availability.

Motors with **efficiency class IE3** available on request.

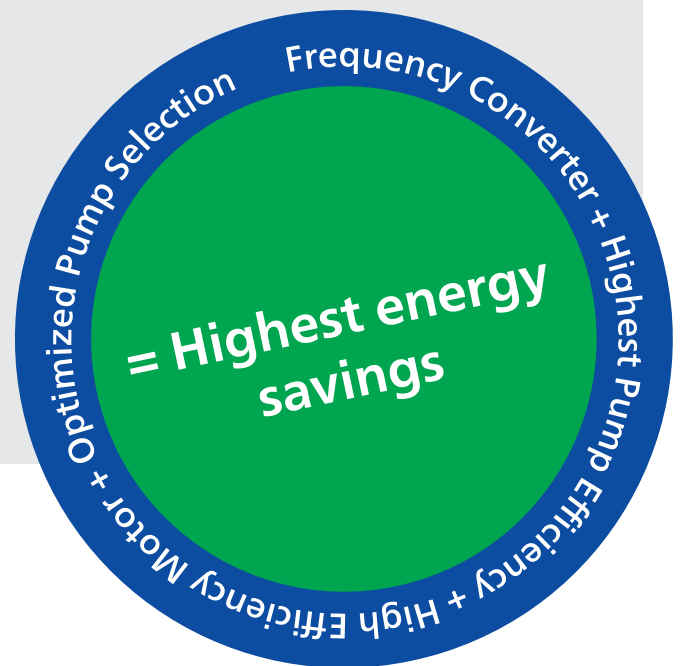
\* Different horsepower rating at 60 Hz, see data sheet for 4 pole operation.

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.

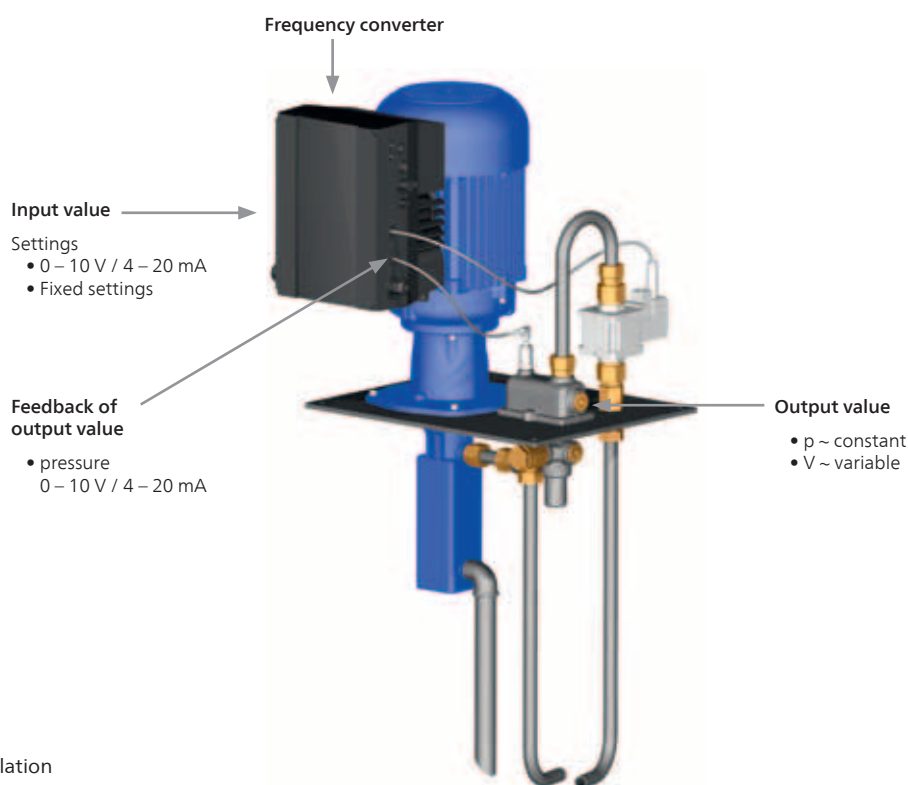


Fig. 1: Scheme of regulation

### Variable Speed Control of High Pressure Pumps

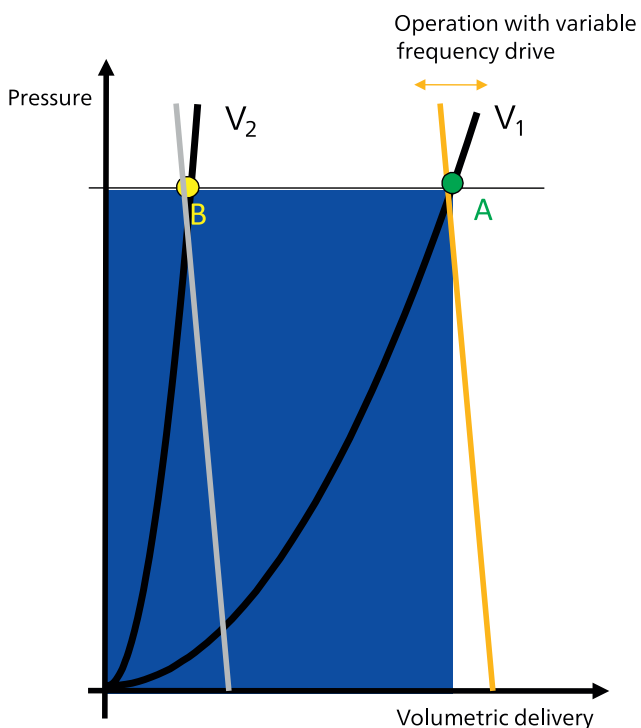


Fig. 2: Potential energy savings of a screw pump with variable frequency drive and two consumers.

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

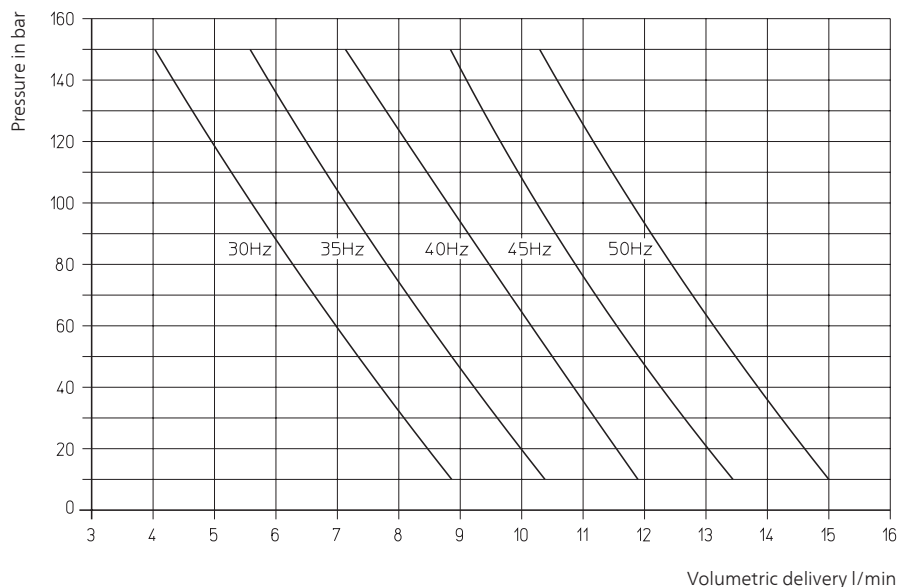
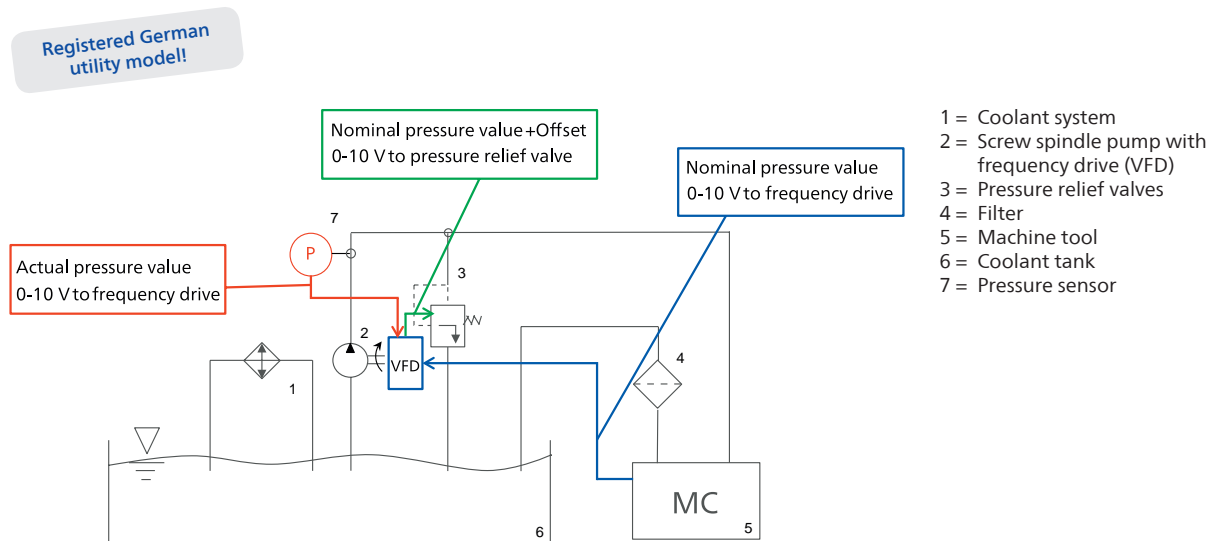


Fig. 3: Example of a BFS130/150 in oil 20 mm<sup>2</sup>/s

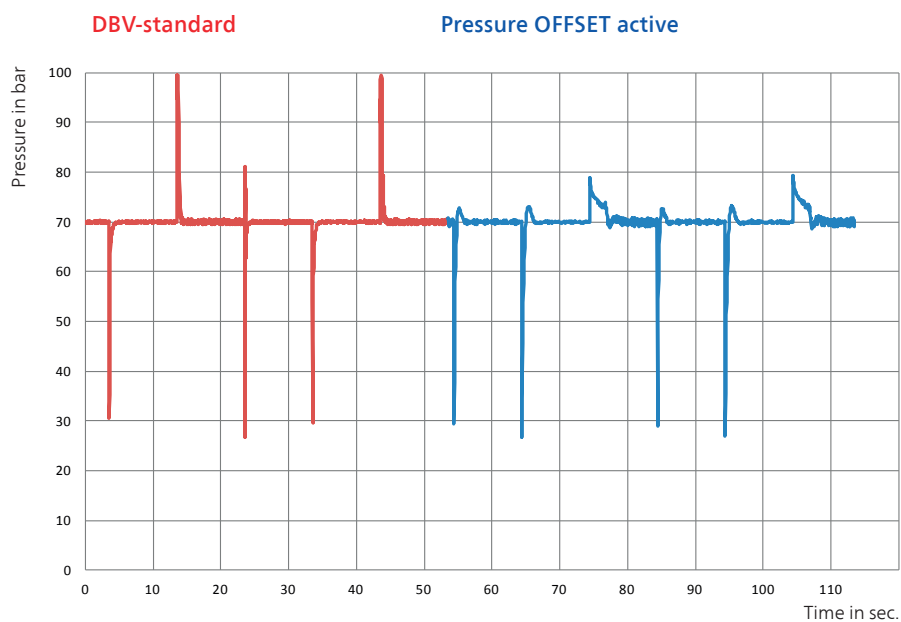


### Brinkmann Pumps Offset Regulation for High Pressure Pumps

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.



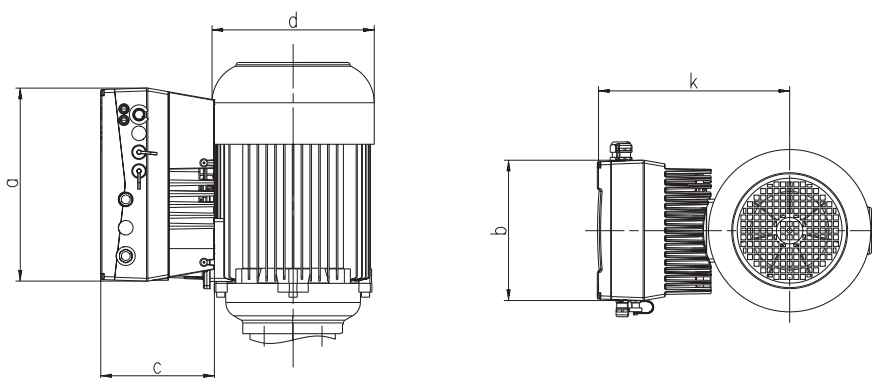
### Minimization of pressure peaks during tool change



## Control / Regulation

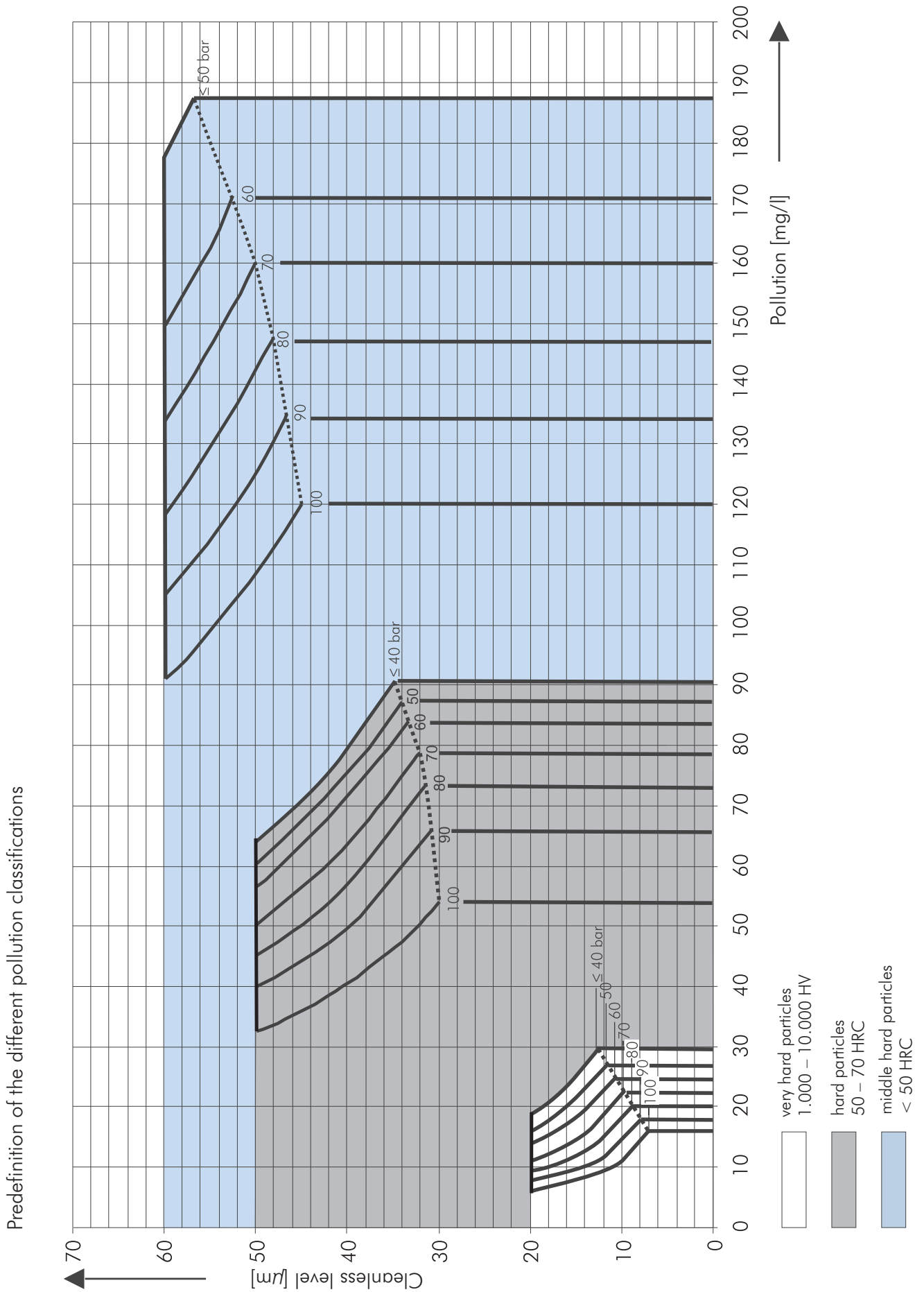
TECHNICAL DATA				
Frequency converter FKO (1.5 – 22 kW)				
Function	Specification			
Rated voltage	3 AC 400 V -10 % ... 480 V +10 %			
Rated frequency	50/60 Hz			
Output ranges	1.5 kW	2.2 / 3 / 4 kW	5.5 / 7.5 kW	10 / 11 / 15 / 18.5 / 22 kW
Housing size	A	B	C	D
Protective system	IP 65			IP 55
EMV approvals acc. to EN61800-3US	C2			
Temperature range	-10 °C ... +50 °C			
Overload capability	1.5 times rated output current			
Protective functions	undervoltage, overvoltage, I <sup>2</sup> 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 <sub>max</sub> = 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



Motor power kW	housing size	a mm	b mm	c mm	d mm	k mm
1.1 – 1.7	A	233	153	120	176	221
1.9 – 4.0	B	270	189	133	218	241
5.0 – 7.5	C	307	233	181	258	256
10.0	D	414	294	233	258	375
11.0 – 22.0	D	414	294	233	314	400

# 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. 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 mm<sup>2</sup>/s (45 cSt)  
over 45 mm<sup>2</sup>/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 11.

## 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

Version	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
Highly wear resistant SIC-bushing around labyrinth seal and coated driving male spindle	-KBT5	○	○	○	●	●	●	○	○	○	●	●	●
Specially coated outer female spindles	-N	○	○	○	○	○	●	○	○	○	○	○	●
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 45)	-G4	○	○	○	○			○	○	○	○		
Viscosity > 45 mm <sup>2</sup> /s		○	○	○	○	○	○	○	○	○	○	○	○
4-pole motor	-4	○	○	○	○	○	○	○	○	○	○	○	○

- Available upon request
- Standard

### 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.

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 mm<sup>2</sup>/s (45 cSt)  
over 45 mm<sup>2</sup>/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 11.

## 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

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

- Available upon request
- 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 / BFS2, FFS2

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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	immersion version	foot mounted version		1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>BFS130/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 15.6</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 7.8</b>		-	-	-	-
10	14	15	0.5	0.5	B 1.3	0.75	39	6.2	7.2	0.2	0.2	0.75	29
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	29
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	29
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	31
50	10.3	13.5	1.5	1.6	B 1.7	2.2	39	-	5.7	-	0.8	1.1	31
60	9.5	13.2	1.8	1.9	B 1.9	2.2	43	-	5.4	-	0.9	1.1	31
70	8.7	12.8	2.1	2.1	B 2.2	3.0	43	-	5	-	1.1	1.5	34
80	7.9	12.5	2.3	2.4	B 2.6	3.0	44	-	4.7	-	1.2	1.5	34
90	7.1	12.1	2.6	2.7	B 3.3	3.0	54	-	4.3	-	1.3	1.5	34
100	6.4	11.8	2.8	2.9	B 3.3	4.0	54	-	4	-	1.5	2.2	41
110	5.7	11.5	3.1	3.2	B 3.3	4.0	54	-	-	-	-	-	-
120	5	11.2	3.4	3.5	B 4.0	4.0	57	-	-	-	-	-	-
130	-	10.9	-	3.8	B 4.0	4.0	57	-	-	-	-	-	-
140	-	10.6	-	4.0	B 4.0	5.5	57	-	-	-	-	-	-
150	-	10.3	-	4.3	B 5.0	5.5	73	-	-	-	-	-	-
<b>BFS140/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 20.9</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 10.5</b>		-	-	-	-
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	29
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	29
30	16.3	19	1.3	1.4	B 1.5	1.5	39	5.8	8.6	0.6	0.7	1.1	31
40	15.1	18.5	1.6	1.7	B 1.9	2.2	43	4.7	8.1	0.8	0.9	1.1	31
50	14	18	2.0	2.1	B 2.2	3.0	43	3.6	7.6	1.0	1.1	1.5	34
60	13	17.6	2.3	2.5	B 2.6	3.0	44	2.6	7.1	1.1	1.3	1.5	34
70	12	17.1	2.7	2.8	B 3.3	3.0	54	-	6.6	-	1.4	2.2	41
80	11.1	16.6	3.0	3.2	B 3.3	4.0	54	-	6.2	-	1.6	2.2	41
90	10.3	16.2	3.4	3.5	B 4.0	4.0	57	-	5.7	-	1.8	2.2	41
100	9.5	15.7	3.7	3.9	B 4.0	5.5	57	-	5.3	-	2.0	2.2	41
110	8.3	15.3	4.1	4.3	B 5.0	5.5	73	-	-	-	-	-	-
120	7.3	14.8	4.4	4.6	B 5.0	5.5	73	-	-	-	-	-	-
130	6.3	14.4	4.8	5.0	B 5.0	5.5	73	-	-	-	-	-	-
140	-	14	-	5.3	B 5.5	5.5	73	-	-	-	-	-	-
150	-	13.6	-	5.7	B 7.5	7.5	81	-	-	-	-	-	-
<b>BFS232/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 26.1</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 13.1</b>		-	-	-	-
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	29
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	32
30	23	24.9	1.5	1.7	B 1.9	2.2	44	10	11.9	0.8	0.9	1.1	32
40	22.4	24.6	2.0	2.2	B 2.6	3.0	44	9.4	11.6	1.0	1.2	1.5	34
50	21.8	24.4	2.4	2.7	B 3.3	3.0	55	8.8	11.3	1.2	1.4	2.2	41
60	21.2	24.1	2.8	3.1	B 3.3	4.0	55	8.2	11.1	1.4	1.6	2.2	41
70	20.6	23.9	3.3	3.6	B 4.0	4.0	57	7.6	10.8	1.7	1.9	2.2	41
80	20	23.6	3.7	4.0	B 4.0	5.5	57	7	10.6	1.9	2.1	3.0	46
90	19.5	23.3	4.1	4.5	B 5.0	5.5	74	6.4	10.3	2.1	2.3	3.0	46
100	18.9	23.1	4.6	4.9	B 5.0	5.5	74	5.8	10	2.3	2.5	3.0	46
110	18.4	22.9	5.0	5.4	B 5.5	7.5	74	-	-	-	-	-	-
120	17.8	22.6	5.5	5.8	B 7.5	7.5	82	-	-	-	-	-	-
130	17.3	22.4	5.9	6.3	B 7.5	7.5	82	-	-	-	-	-	-
140	16.7	22.1	6.3	6.7	B 7.5	7.5	82	-	-	-	-	-	-
150	16.2	21.9	6.8	7.2	B 7.5	7.5	82	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

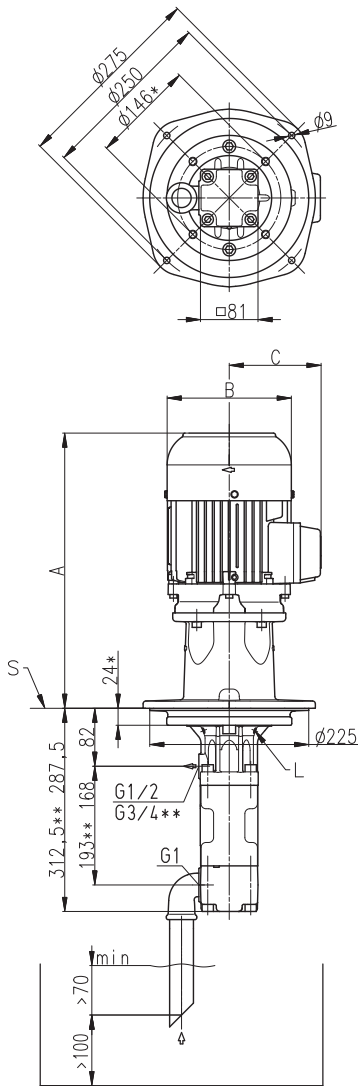
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

# Characteristics and dimensions

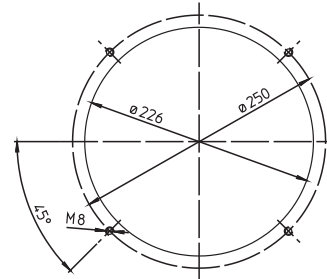
## BFS1, FFS1 / BFS2, FFS2

50 Hz

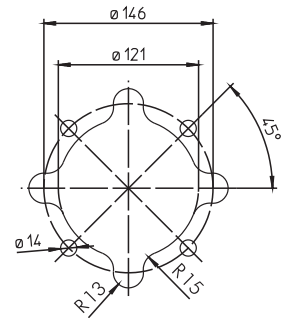


### Mounting hole patterns

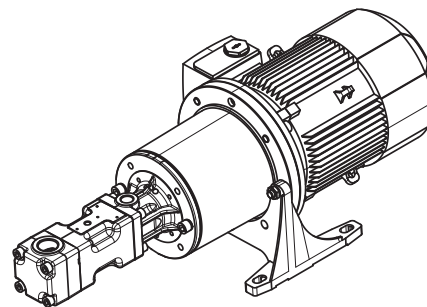
BFS1 / BFS2



TFS1 / TFS2

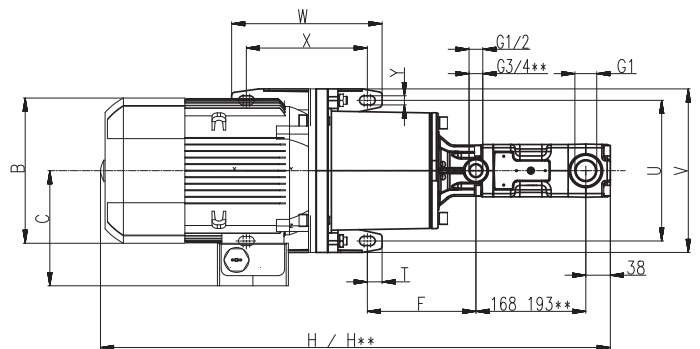
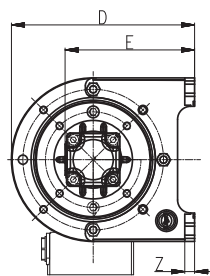


All corners must be deburred!  
According to ISO 2768-m



- \*) Dimensions for 4-pole standard motor upon request
- \*\*\*) Dimensions for BFS2
- 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 / 1.7	389	176	130
B 1.9 / 2.2	414	176	130
B 2.6	424	176	130
B 3.3 / 4.0	478	218	150
B 5.0 / 5.5	514	258	190
B 7.5	552	258	190



Dimensions H\*\* = H+25 or see page 17

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 / 1.1	0.75	159	121	212	155	138	676	15	180	210	90	60	11	12
1.5	1.1 / 1.5	178	126	212	155	138	721	15	180	210	90	60	11	12
2.2	-	180	126	212	155	138	721	15	180	210	90	60	11	12
-	2.2 / 3.0	198	166	280	198	166	786	22.5	215	250	260	185	14	15
3.0	-	198	166	280	198	166	786	22.5	215	250	230	185	14	15
4.0	-	222	177	280	198	166	780	22.5	215	250	230	185	14	15
5.5 / 7.5	-	262	202	335	228	171	857	22.5	265	300	270	225	14	18

# High Pressure Pumps



## BFS2, FFS2

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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	immersion version	foot mounted version		1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>BFS238/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 31</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 15.5</b>		-	-	-	-
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	29
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	32
30	27.4	29.5	1.8	1.8	B 1.9	2.2	44	11.9	14	0.9	0.9	1.1	32
40	26.7	29.2	2.3	2.4	B 2.6	3.0	44	11.2	13.7	1.2	1.2	1.5	34
50	26	28.9	2.8	2.9	B 3.3	4.0	55	10.5	13.4	1.4	1.5	2.2	41
60	25.3	28.7	3.3	3.5	B 4.0	4.0	57	9.8	13.2	1.7	1.8	2.2	41
70	24.6	28.4	3.8	4.0	B 4.0	5.5	57	9.1	12.9	1.9	2.0	2.2	41
80	23.9	28.1	4.4	4.5	B 5.0	5.5	74	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	74	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	82	7	12.1	2.7	2.9	4.0	53
110	21.9	27.3	5.9	6.2	B 7.5	7.5	82	-	-	-	-	-	-
120	21.2	27	6.4	6.8	B 7.5	7.5	82	-	-	-	-	-	-
130	20.6	26.7	6.9	7.3	B 7.5	11.0	82	-	-	-	-	-	-
140	19.9	26.5	7.5	7.9	B 10.0	11.0	97	-	-	-	-	-	-
150	19.3	26.2	8.0	8.4	B 10.0	11.0	97	-	-	-	-	-	-
<b>BFS250/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 40.8</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 20.4</b>		-	-	-	-
10	37.9	39.6	0.9	0.9	B 1.3	1.1	40	17.5	19.2	0.5	0.5	0.75	29
20	37	39.2	1.6	1.6	B 1.7	2.2	40	16.6	18.8	0.8	0.8	1.1	32
30	36	38.9	2.3	2.3	B 2.6	3.0	44	15.6	18.5	1.2	1.2	1.5	34
40	35.1	38.5	3.0	3.1	B 3.3	4.0	44	14.7	18.1	1.5	1.6	2.2	41
50	34.3	38.1	3.6	3.8	B 4.0	4.0	57	13.9	17.7	1.8	1.9	2.2	41
60	33.5	37.7	4.3	4.5	B 5.0	5.5	74	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	74	12.3	17	2.5	2.6	3.0	46
80	31.9	37	5.7	5.9	B 7.5	7.5	82	11.5	16.6	2.9	3.0	4.0	53
90	31.2	36.6	6.4	6.6	B 7.5	7.5	82	10.7	16.2	3.2	3.3	4.0	53
100	30.5	36.2	7.0	7.4	B 7.5	11.0	82	9.9	15.8	3.5	3.7	4.0	53
110	29.2	35.9	7.7	8.1	B 10.0	11.0	97	-	-	-	-	-	-
120	27.9	35.5	8.4	8.8	B 10.0	11.0	97	-	-	-	-	-	-
130	26.6	35.1	9.1	9.5	B 10.0	11.0	97	-	-	-	-	-	-
140	25.4	34.7	9.8	10.2	-	11.0	97	-	-	-	-	-	-
150	24.1	34.3	10.4	11.0	-	15.0	101	-	-	-	-	-	-
<b>BFS260/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 48.9</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 24.5</b>		-	-	-	-
10	45.5	47.4	1.0	1.1	B 1.5	1.5	40	21	23	0.5	0.6	0.75	29
20	44.3	46.9	1.9	2.0	B 2.2	3.0	44	19.9	22.4	0.9	1.0	1.5	34
30	43.2	46.3	2.7	2.9	B 3.3	4.0	44	18.7	21.8	1.4	1.4	2.2	41
40	42	45.7	3.5	3.8	B 4.0	5.5	57	17.6	21.2	1.8	1.9	2.2	41
50	40.9	45.1	4.3	4.6	B 5.0	5.5	74	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	82	15.3	20	2.6	2.8	3.0	46
70	38.5	43.9	5.9	6.4	B 7.5	7.5	82	14.1	19.4	3.0	3.2	4.0	53
80	37.4	43.3	6.8	7.3	B 7.5	11.0	82	12.9	18.8	3.4	3.7	4.0	53
90	36.2	42.6	7.6	8.1	B 10.0	11.0	97	11.8	18.2	3.8	4.1	5.5	63
100	35	42	8.5	9.0	B 10.0	11.0	97	10.6	17.6	4.3	4.5	5.5	63
110	33.4	41.4	9.3	9.9	B 10.0	11.0	97	-	-	-	-	-	-
120	31.8	40.7	10.0	10.8	-	11.0	97	-	-	-	-	-	-
130	30.1	39.5	10.9	11.7	-	15.0	101	-	-	-	-	-	-
140	28.5	38.2	11.7	12.5	-	15.0	101	-	-	-	-	-	-
150	26.9	37	12.5	13.4	-	15.0	101	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Higher pressures (up to 200 bar) upon request.

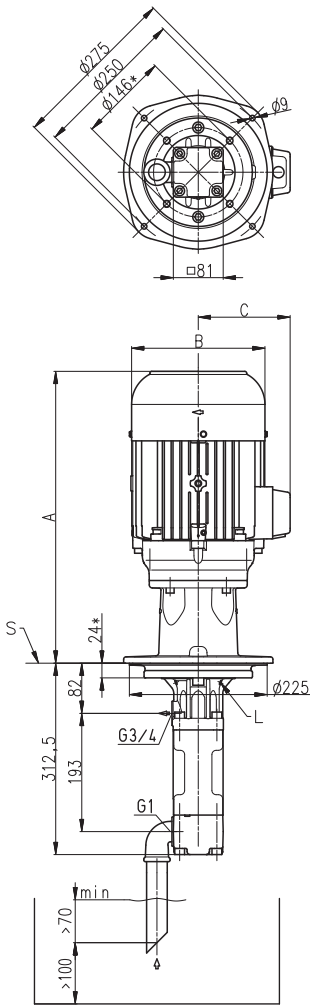
Viscosity > 20 mm<sup>2</sup>/s more power consumption.



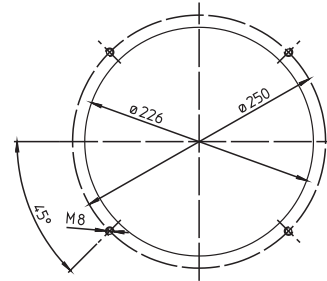
# Characteristics and dimensions

## BFS2, FFS2

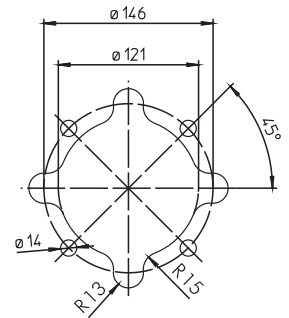
50 Hz



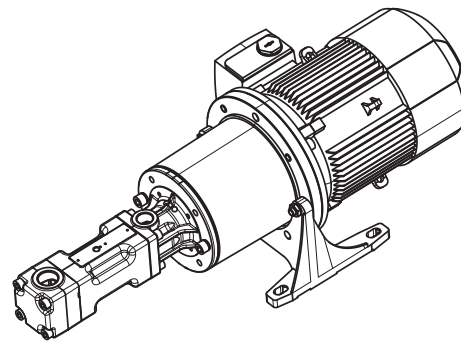
Mouting hole patterns  
BFS1 / BFS2



TFS1 / TFS2

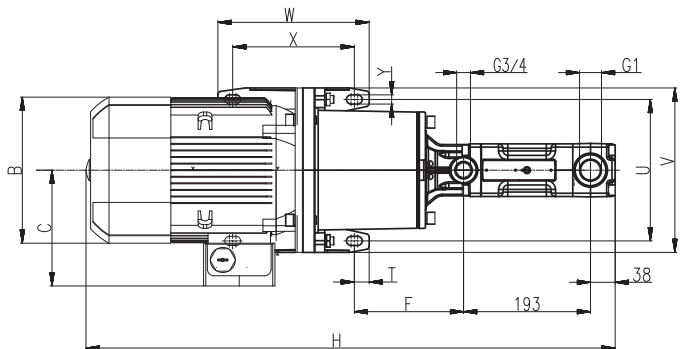
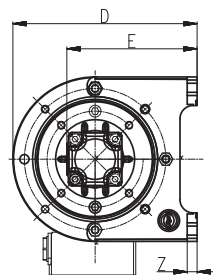


All corners must be deburred!  
According to ISO 2768-m



\*) 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 / 1.7	389	176	130
B 1.9 / 2.2	414	176	130
B 2.6	424	176	130
B 3.3 / 4.0	478	218	150
B 5.0 / 5.5	514	258	190
B 7.5	552	258	190
B 10.0	602	258	190



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
1.1	0.75	159	121	212	155	138	701	15	180	210	90	60	11	12
1.5	1.1 / 1.5	178	126	212	155	138	746	15	180	210	90	60	11	12
2.2	-	180	126	212	155	138	746	15	180	210	90	60	11	12
-	2.2 / 3.0	198	166	280	198	166	811	22.5	215	250	260	185	14	15
3.0	-	198	166	280	198	166	811	22.5	215	250	230	185	14	15
4.0	-	222	177	280	198	166	805	22.5	215	250	230	185	14	15
-	4.0	222	177	280	198	166	805	22.5	215	250	260	185	14	15
5.5 / 7.5	5.5	262	202	335	228	171	882	22.5	265	300	270	225	14	18
11.0 / 15.0	-	314	237	410	278	210	1051	20	300	350	305	265	18	18

# High Pressure Pumps



## 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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS348/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 64.1</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 32.1</b>		-	-	-	-
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	3.0	52	26.5	29.4	1.2	1.3	1.5	46
30	57.1	60.7	3.6	3.9	5.5	73	25	28.6	1.8	1.9	2.2	53
40	55.7	59.9	4.7	5.1	5.5	73	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	65
60	53.1	58.5	6.8	7.3	11.0	104	21.1	26.5	3.4	3.5	4.0	65
70	51.9	57.9	7.9	8.5	11.0	104	19.8	25.8	3.9	4.1	5.5	75
80	50.7	57.3	8.9	9.6	11.0	104	18.7	25.2	4.4	4.7	5.5	75
90	49.6	56.7	10.0	10.7	15.0	113	17.4	24.6	5.0	5.2	5.5	75
100	48.6	56.1	11.1	11.8	15.0	113	16.2	24.1	5.5	5.8	7.5	90
110	46.7	55.6	12.1	13.0	15.0	113	-	-	-	-	-	-
120	45	55.2	13.2	14.2	15.0	113	-	-	-	-	-	-
130	43.3	54.7	14.3	15.3	18.5	133	-	-	-	-	-	-
140	41.6	54.4	15.3	16.4	18.5	133	-	-	-	-	-	-
150	40	54	16.4	17.6	18.5	133	-	-	-	-	-	-
<b>TFS364/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 85.5</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 42.8</b>		-	-	-	-
10	79.9	83	1.8	2.0	3.0	52	37.1	40.3	0.9	0.9	1.5	46
20	78.1	82	3.3	3.5	4.0	63	35.3	39.2	1.6	1.7	2.2	53
30	76.3	81	4.7	5.0	5.5	73	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	65
50	73	79.2	7.5	8.0	11.0	104	30.2	36.5	3.7	3.9	5.5	75
60	71.4	78.4	9.0	9.5	11.0	104	28.7	35.7	4.4	4.7	5.5	75
70	69.9	77.6	10.4	10.9	15.0	113	27.1	34.9	5.1	5.4	7.5	90
80	68.4	76.9	11.8	12.4	15.0	113	25.6	34.1	5.9	6.1	7.5	90
90	66.9	76.1	13.2	13.9	15.0	113	24	33.4	6.6	6.9	7.5	90
100	65.5	75.5	14.7	15.4	18.5	133	22.4	32.7	7.3	7.6	11.0	112
110	63.2	74.8	16.1	16.9	18.5	133	-	-	-	-	-	-
120	61	74.3	17.5	18.4	22.0	162	-	-	-	-	-	-
130	58.8	72.7	18.9	19.9	22.0	162	-	-	-	-	-	-
140	56.6	71.3	20.4	21.4	22.0	162	-	-	-	-	-	-
150	54.5	69.8	21.8	22.8	30.0	219	-	-	-	-	-	-
<b>TFS376/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 101.5</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 50.8</b>		-	-	-	-
10	95.2	98.5	2.1	2.4	4.0	63	44.5	47.8	1.0	1.2	1.5	46
20	93.1	97.3	3.8	4.2	5.5	73	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	65
40	89	95.1	7.2	7.9	11.0	104	38.2	44.4	3.5	3.9	5.5	75
50	87	94.1	8.9	9.7	11.0	104	36.2	43.3	4.4	4.8	5.5	75
60	85	93.1	10.6	11.5	15.0	113	34.3	42.4	5.2	5.7	7.5	90
70	83.1	92.2	12.2	13.3	15.0	113	32.3	41.4	6.1	6.6	7.5	90
80	81.2	91.3	13.9	15.1	18.5	133	30.4	40.5	6.9	7.4	11.0	112
90	79.3	90.4	15.6	16.9	18.5	133	28.4	39.7	7.8	8.4	11.0	112
100	77.5	89.6	17.3	18.8	22.0	162	26.5	38.9	8.6	9.2	11.0	112
110	74.5	88.9	19.0	20.6	22.0	162	-	-	-	-	-	-
120	71.6	88.2	20.7	22.4	30.0	219	-	-	-	-	-	-
130	68.8	86.4	22.4	24.2	30.0	219	-	-	-	-	-	-
140	66	84.7	24.0	26.0	30.0	219	-	-	-	-	-	-
150	63.2	83	25.7	27.9	30.0	219	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

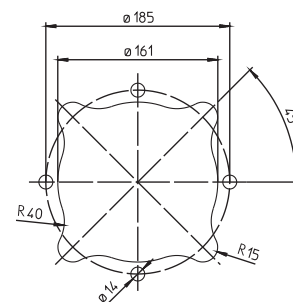
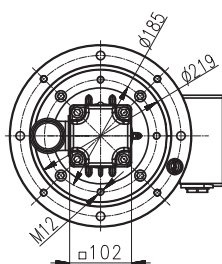
# Characteristics and dimensions

## TFS3, FFS3

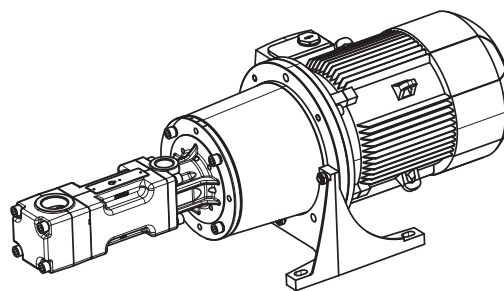
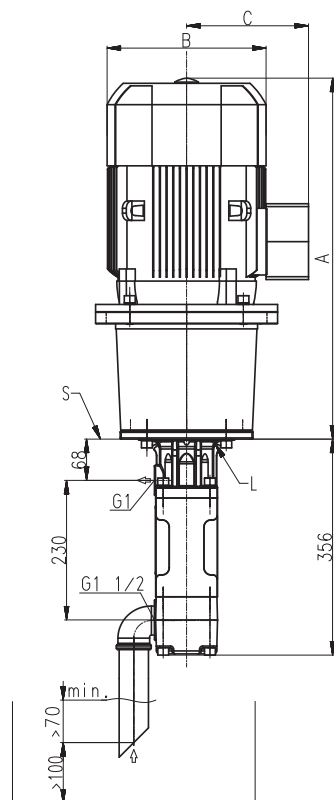
50 Hz

### Mouting hole patterns

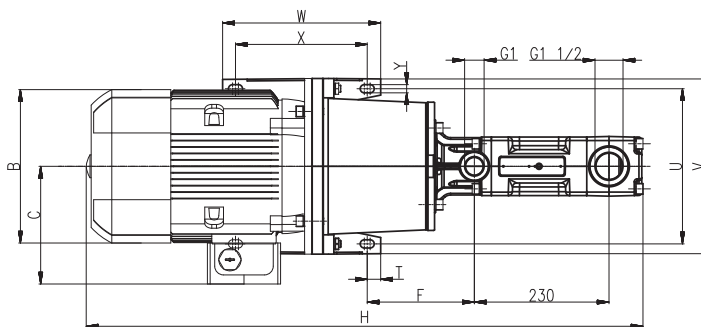
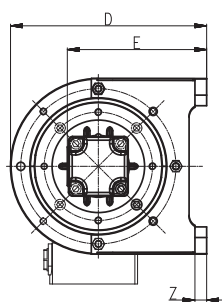
TFS3 / TFS4



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	476	178	126	212	165	152	832	15	180	210	90	60	11	12
-	1.5	533	178	126	212	165	152	832	15	180	210	90	60	11	12
2.2	-	476	180	126	212	165	152	832	15	180	210	90	60	11	12
-	2.2	526	198	166	280	208	186	889	22.5	215	250	260	185	14	15
3.0	-	533	198	166	280	208	186	889	22.5	215	250	230	185	14	15
-	3.0	595	198	166	280	208	186	889	22.5	215	250	260	185	14	15
-	4.0	595	222	177	280	208	186	882	22.5	215	250	260	185	14	15
4.0	-	526	222	177	280	208	186	882	22.5	215	250	230	185	14	15
5.5 / 7.5	-	595	262	202	335	238	183	951	22.5	265	300	270	225	14	18
-	5.5 / 7.5	764	262	202	335	238	183	951	22.5	265	300	270	225	14	18
11.0 / 15.0 / 18.5	11.0	764	314	237	410	288	222	1120	20	300	350	305	265	18	18
22.0	-	828	356	286	410	288	222	1184	20	300	350	305	265	18	18
30.0	-	881	396	315	460	313	212	1237	25	350	400	350	300	18	20

# High Pressure Pumps



## TFS4, FFS4

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	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS460/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 125.3</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 62.7</b>		–	–	–	–
10	118	122	2.7	3.0	4.0	74	55	59	1.2	1.3	1.5	57
20	115	120	4.8	5.2	5.5	83	52	57	2.3	2.4	3.0	64
30	112	118	6.9	7.4	11.0	115	50	56	3.3	3.5	4.0	76
40	110	117	9.0	9.6	11.0	115	47	54	4.4	4.7	5.5	85
50	107	116	11.0	11.8	15.0	124	44	53	5.4	5.8	7.5	100
60	105	114	13.1	14.0	15.0	124	42	52	6.5	6.9	7.5	100
70	102	113	15.2	16.1	18.5	144	40	50	7.5	8.0	11.0	123
80	100	112	17.3	18.3	22.0	173	37	49	8.6	9.1	11.0	123
90	98	111	19.4	20.5	22.0	173	35	48	9.6	10.3	11.0	123
100	96	110	21.5	22.7	30.0	230	32	47	10.7	11.3	15.0	149
110	94	109	23.6	24.9	30.0	230	–	–	–	–	–	–
120	91	108	25.6	27.1	30.0	230	–	–	–	–	–	–
<b>TFS480/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 167.1</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 83.6</b>		–	–	–	–
10	157	162	3.4	3.7	5.5	83	74	79	1.6	1.8	2.2	64
20	153	160	6.2	6.6	7.5	96	70	76	3.0	3.2	4.0	76
30	150	158	9.0	9.5	11.0	115	66	74	4.4	4.7	5.5	85
40	146	156	11.7	12.4	15.0	124	63	72	5.8	6.1	7.5	100
50	143	154	14.5	15.2	18.5	144	60	70	7.2	7.6	11.0	123
60	140	152	17.3	18.1	18.5	144	56	68	8.6	9.2	11.0	123
70	137	150	20.1	21.0	22.0	173	53	67	9.9	10.6	11.0	123
80	134	149	22.9	23.9	30.0	230	51	65	11.3	12.1	15.0	149
90	132	147	25.7	26.7	30.0	230	47	64	12.7	13.6	15.0	149
100	129	146	28.5	29.6	30.0	230	44	63	14.1	15.0	18.5	168
110	126	145	31.3	32.5	37.0	259	–	–	–	–	–	–
120	124	144	34.0	35.4	37.0	259	–	–	–	–	–	–
<b>TFS496/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 200.5</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 100.3</b>		–	–	–	–
10	189	194	3.9	4.4	5.5	83	89	94	1.9	2.1	3.0	64
20	185	192	7.3	8.0	11.0	115	85	92	3.5	3.9	5.5	85
30	181	190	10.6	11.5	15.0	124	80	90	5.2	5.7	7.5	100
40	177	188	14.0	15.1	18.5	144	76	88	6.9	7.5	11.0	123
50	173	186	17.3	18.6	22.0	173	72	86	8.6	9.3	11.0	123
60	169	184	20.7	22.2	30.0	230	69	84	10.2	11.1	15.0	149
70	166	182	24.0	25.7	30.0	230	65	82	11.9	12.9	15.0	149
80	162	180	27.3	29.3	37.0	259	62	80	13.6	14.8	18.5	168
90	159	179	30.7	32.8	37.0	259	58	78	15.3	16.6	18.5	168
100	156	177	34.0	36.4	45.0	374	55	77	16.9	18.4	22.0	188
110	153	176	37.4	39.9	45.0	374	–	–	–	–	–	–
120	149	174	40.7	43.5	45.0	374	–	–	–	–	–	–

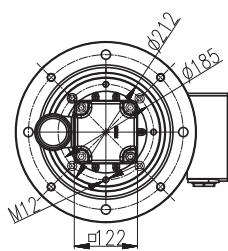
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

# Characteristics and dimensions

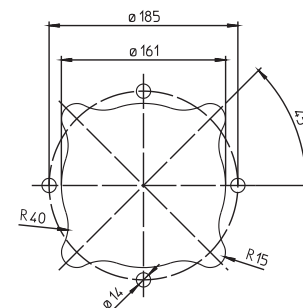
## TFS4, FFS4

50 Hz

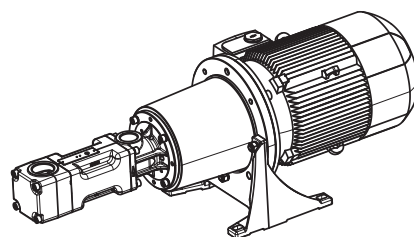
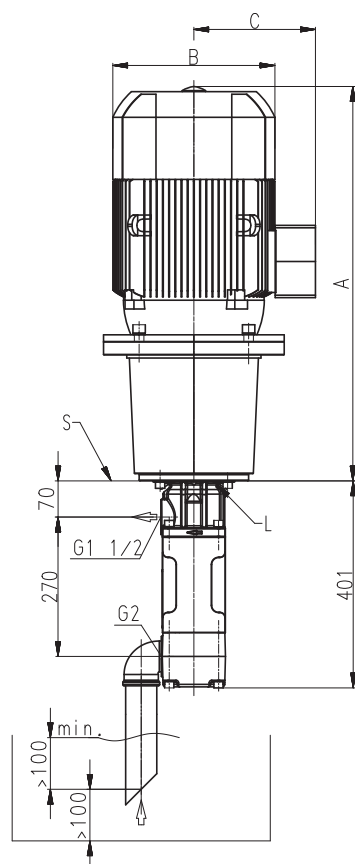


Mounting hole patterns

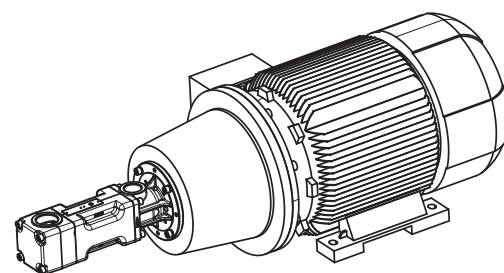
TFS3 / TFS4



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

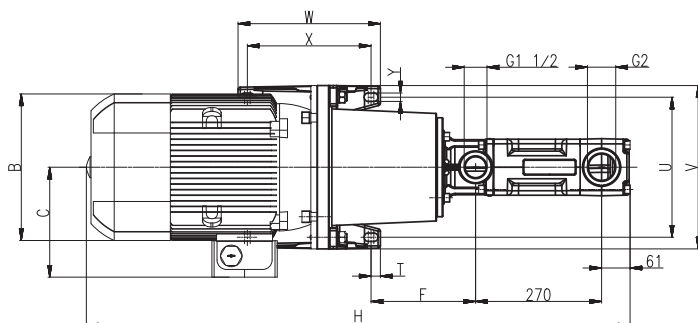
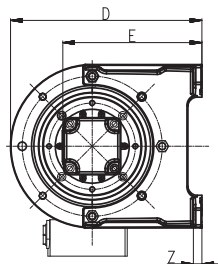


<math>< 45\text{kW}</math>



<math>\geq 45\text{kW}</math>

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
-	1.5	481	178	126	212	175	174	882	15	180	210	90	60	11	12
-	2.2 / 3.0	533	198	166	280	218	188	934	22.5	215	250	230	185	14	15
4.0	4.0	526	222	177	280	218	188	927	22.5	215	250	230	185	14	15
5.5 / 7.5	5.5 / 7.5	609	262	202	335	248	199	1010	22.5	265	300	270	225	14	18
11.0 / 15.0 / 18.5	11.0 / 15.0	764	314	237	410	298	224	1165	20	300	350	305	265	18	18
22.0	18.5	828	356	286	410	298	224	1229	20	300	350	305	265	18	18
-	22.0	858	356	286	410	298	224	1259	20	300	350	305	265	18	18
30.0 / 37.0	-	881	396	315	460	323	214	1282	25	350	400	350	300	18	20
45.0	-	986	449	338	450	288	495	1387	25	356	436	361	311	19	34

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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS574/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 241.6</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 120.8</b>		–	–	–	–
10	230	235	5.0	5.7	7.5	125	109	114	2.3	2.7	4.0	105
20	226	233	9.1	9.9	11.0	144	105	112	4.3	4.8	5.5	114
30	222	231	13.1	14.2	15.0	153	101	110	6.3	7.0	7.5	129
40	219	229	17.1	18.4	22.0	202	98	109	8.4	9.1	11.0	152
50	216	228	21.1	22.6	30.0	259	95	107	10.4	11.3	15.0	178
60	213	226	25.2	26.9	30.0	259	92	105	12.4	13.4	15.0	178
70	210	224	29.2	31.1	37.0	288	89	104	14.4	15.5	18.5	197
80	207	223	33.2	35.4	37.0	288	86	102	16.4	17.7	18.5	197
90	204	221	37.2	39.6	45.0	403	83	101	18.4	19.8	22.0	217
100	202	220	41.3	43.8	45.0	403	80	99	20.5	21.9	30.0	273
110	199	219	45.3	48.1	55.0	498	–	–	–	–	–	–
120	196	217	49.3	52.3	55.0	498	–	–	–	–	–	–
<b>TFS5100/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 326.5</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 163.3</b>		–	–	–	–
10	310	318	6.4	7.1	11.0	144	147	155	3.0	3.5	5.5	114
20	306	316	11.9	12.9	15.0	153	143	152	5.7	6.4	7.5	129
30	302	313	17.3	18.6	22.0	202	139	150	8.5	9.3	11.0	152
40	298	311	22.8	24.4	30.0	259	135	148	11.2	12.2	15.0	178
50	294	309	28.2	30.2	37.0	288	131	146	13.9	15.1	18.5	197
60	291	307	33.7	36.0	37.0	288	127	144	16.6	18.0	18.5	197
70	287	305	39.1	41.7	45.0	403	124	142	19.3	20.9	22.0	217
80	284	303	44.5	47.5	55.0	498	120	140	22.1	23.9	30.0	273
90	280	302	50.0	53.3	55.0	498	116	138	24.8	26.8	30.0	273
100	277	300	55.4	59.1	75.0	608	113	137	27.5	29.7	37.0	363
110	273	299	60.9	64.8	75.0	608	–	–	–	–	–	–
120	270	297	66.3	70.6	75.0	608	–	–	–	–	–	–

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

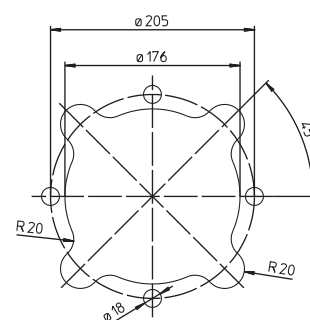
# Characteristics and dimensions

## TFS5, FFS5

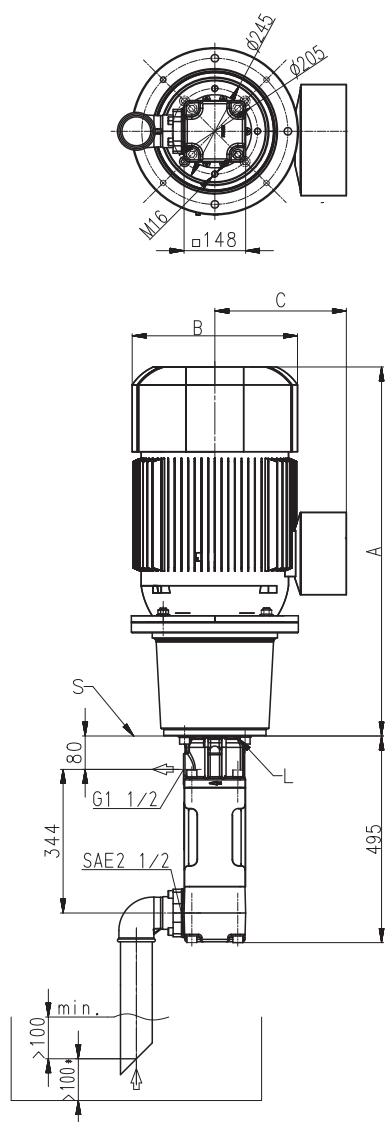
50 Hz

### Mounting hole patterns

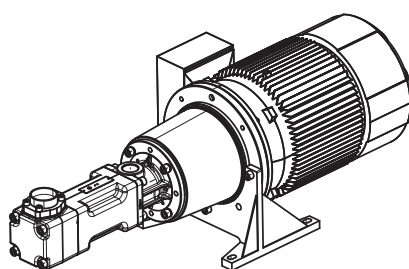
TFS5



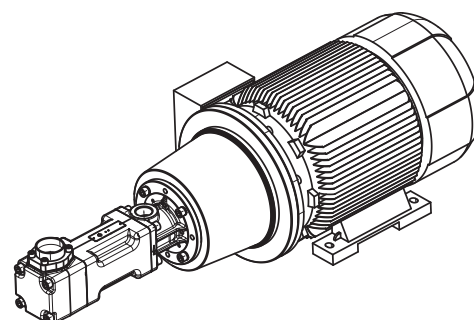
All corners must be deburred  
According to ISO 2768-m



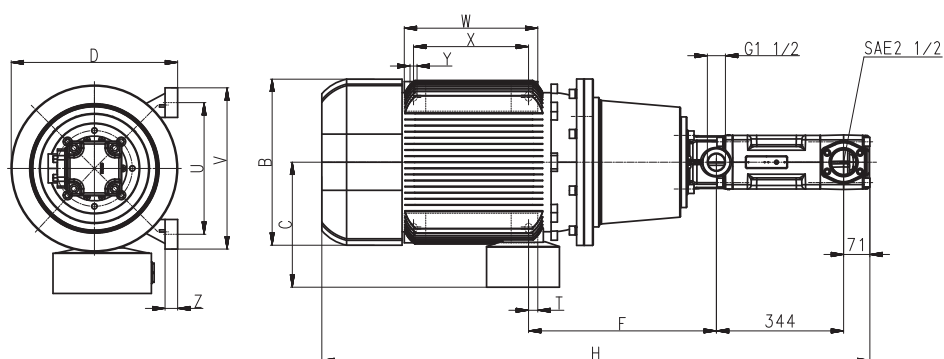
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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	556	222	177	280	228	1051	22.5	215	250	230	185	14	15
7.5	5.5 / 7.5	622	262	202	335	222	1117	22.5	265	300	270	225	14	18
11.0 / 15.0	11.0 / 15.0	767	314	237	410	237	1262	20	300	350	305	265	18	18
22.0	18.5	831	356	286	410	237	1326	20	300	350	305	265	18	18
-	22.0	861	356	286	410	237	1356	20	300	350	305	265	18	18
30.0 / 37.0	30.0	884	396	315	460	227	1379	25	350	400	350	300	18	20
-	37.0	927	449	338	520	223	1422	25	400	450	385	335	18	20
45.0	-	989	449	338	450	508	1484	25	356	436	361	311	19	34
55.0	-	1059	497	410	525	560	1554	30	406	490	409	349	24	40
75.0	-	1135	551	433	555	582	1630	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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS5120/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 391.8</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 195.9</b>		–	–	–	–
10	372	382	7.5	8.7	11.0	144	176	186	3.6	4.1	5.5	114
20	366	379	14.1	15.6	18.5	173	171	183	6.8	7.6	11.0	152
30	361	376	20.6	22.5	30.0	259	165	180	10.1	11.1	15.0	178
40	355	373	27.1	29.5	37.0	288	160	177	13.4	14.6	18.5	197
50	350	370	33.7	36.4	45.0	403	154	175	16.6	18.1	22.0	217
60	345	368	40.2	43.3	45.0	403	149	172	19.9	21.6	22.0	217
70	340	366	46.7	50.2	55.0	498	144	170	23.2	25.1	30.0	273
80	336	364	53.2	57.1	75.0	608	140	168	26.4	28.6	30.0	273
90	331	362	59.8	64.0	75.0	608	134	166	29.7	32.1	37.0	363
100	327	360	66.3	71.0	75.0	608	129	164	33.0	35.6	37.0	363
110	322	358	72.8	77.9	90.0	693	–	–	–	–	–	–
120	318	357	79.4	84.8	90.0	693	–	–	–	–	–	–
<b>TFS5130/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 424.5</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 212.2</b>		–	–	–	–
10	403	412	8.1	9.2	11.0	144	191	199	3.8	4.3	5.5	114
20	396	407	15.1	16.5	18.5	173	184	195	7.4	8.0	11.0	152
30	389	402	22.2	23.7	30.0	259	177	190	10.9	11.7	15.0	178
40	383	398	29.3	31.0	37.0	288	171	186	14.4	15.3	18.5	197
50	377	394	36.4	38.3	45.0	403	165	181	18.0	19.0	22.0	217
60	371	390	43.4	45.6	55.0	498	159	177	21.5	22.7	30.0	273
70	366	386	50.5	52.8	55.0	498	154	174	25.1	26.4	30.0	273
80	361	382	57.6	60.1	75.0	608	149	170	28.6	30.0	37.0	363
90	357	379	64.7	67.4	75.0	608	143	166	32.1	33.7	37.0	363
100	352	375	71.7	74.7	90.0	693	138	163	35.7	37.4	45.0	403
110	347	372	78.8	81.9	90.0	693	–	–	–	–	–	–
120	343	369	85.9	89.2	110.0	868	–	–	–	–	–	–

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Viscosity > 20 mm<sup>2</sup>/s more power consumption.



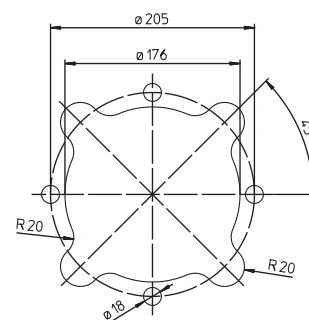
# Characteristics and dimensions

## TFS5, FFS5

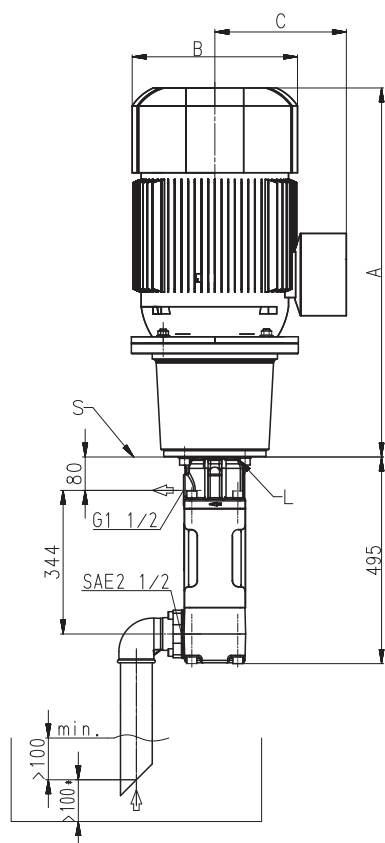
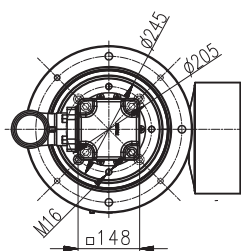
50 Hz

### Mounting hole patterns

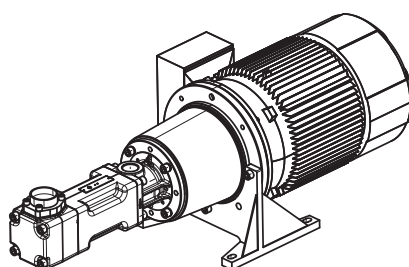
TFS5



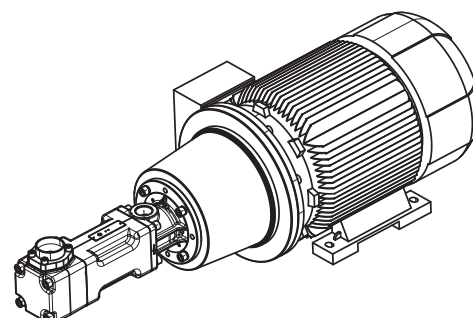
All corners must be deburred  
According to ISO 2768-m



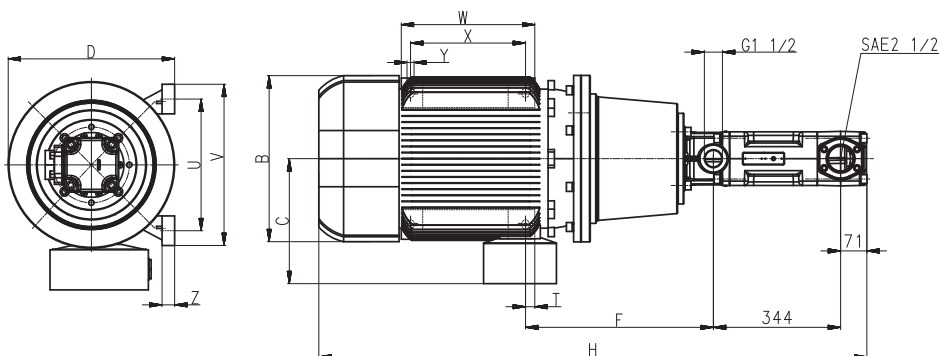
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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	622	262	202	335	222	1117	22.5	265	300	270	225	14	18
11.0 / 18.5	11.0 / 15.0	767	314	237	410	237	1262	20	300	350	305	265	18	18
–	18.5	831	356	286	410	237	1326	20	300	350	305	265	18	18
–	22.0	861	356	286	410	237	1356	20	300	350	305	265	18	18
30.0 / 37.0	30.0	884	396	315	460	227	1379	25	350	400	350	300	18	20
–	37.0	927	449	338	520	223	1422	25	400	450	385	335	18	20
45.0	–	989	449	338	450	508	1484	25	356	436	361	311	19	34
–	45.0	987	449	338	450	508	1482	25	356	436	361	311	19	34
55.0	–	1059	497	410	525	560	1554	30	406	490	409	349	24	40
75.0	–	1135	551	433	555	582	1630	55.5	457	540	479	368	24	40
90.0	–	1135	551	433	555	582	1630	30	457	540	479	419	24	40
110.0	–	1239	616	515	645	623	1734	35	508	628	527	457	35	52

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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS690/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 459</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 230</b>		-	-	-	-
10	445	450	9.5	11.2	15.0	213	216	220	4.4	5.1	7.5	190
20	437	445	17.1	18.8	22.0	262	207	216	8.3	9.0	11.0	212
30	429	440	24.8	26.5	30.0	319	199	211	12.1	12.8	15.0	238
40	421	436	32.4	34.1	37.0	348	191	206	15.9	16.6	18.5	257
50	414	432	40.1	41.8	45.0	464	184	202	19.7	20.4	22.0	277
60	407	428	47.7	49.4	55.0	559	177	198	23.6	24.3	30.0	333
70	401	424	55.4	57.1	75.0	669	171	194	27.4	28.1	30.0	333
80	395	420	63.0	64.7	75.0	669	165	190	31.2	31.9	37.0	424
<b>TFS6120/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 612</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 306</b>		-	-	-	-
10	594	600	12.0	13.7	18.5	233	288	294	5.7	6.4	7.5	190
20	584	594	22.2	23.9	30.0	319	278	288	10.8	11.5	15.0	238
30	574	588	32.4	34.1	37.0	348	268	282	15.9	16.6	18.5	257
40	565	583	42.6	44.3	55.0	559	259	277	21.0	21.7	30.0	333
50	557	578	52.8	54.5	75.0	669	251	272	26.1	26.8	30.0	333
60	549	573	63.0	64.7	75.0	669	243	267	31.2	31.9	37.0	424
70	542	568	73.2	74.9	90.0	754	236	262	36.3	37.0	45.0	464
80	533	563	83.4	85.1	90.0	754	227	257	41.4	42.1	45.0	464
<b>TFS6145/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 740</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 370</b>		-	-	-	-
10	717	725	14.1	15.8	18.5	233	348	355	6.8	7.5	11.0	212
20	704	715	26.5	28.2	30.0	319	334	345	12.9	13.6	15.0	238
30	692	706	38.8	40.5	45.0	464	322	337	19.1	19.8	22.0	277
40	680	698	51.1	52.8	55.0	559	310	328	25.3	26.0	30.0	333
50	669	691	63.4	65.1	75.0	669	299	321	31.4	32.1	37.0	424
60	658	684	75.8	77.5	90.0	754	288	314	37.6	38.3	45.0	464
70	646	676	88.1	89.8	110.0	929	276	306	43.8	44.5	55.0	529
80	635	668	100.4	102.1	110.0	929	265	298	49.9	50.6	55.0	529

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

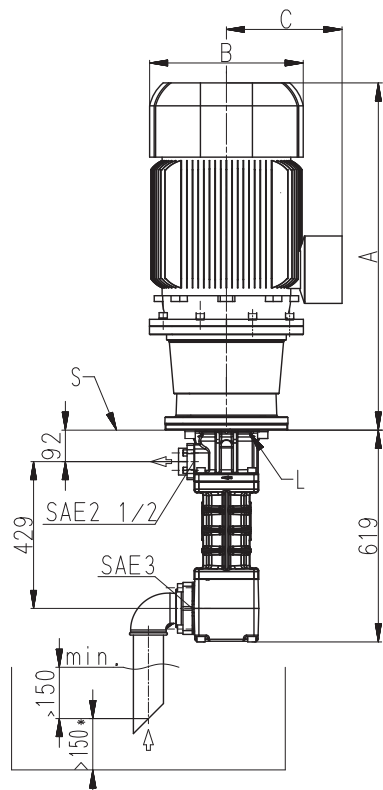
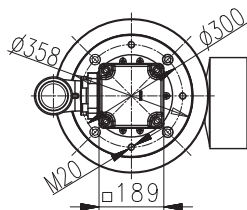
Viscosity > 20 mm<sup>2</sup>/s more power consumption.

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

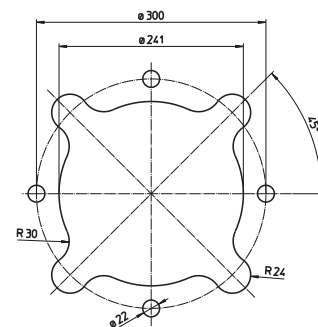
50 Hz



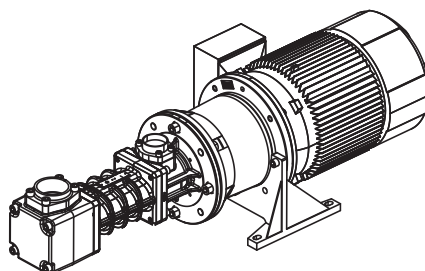
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole

Mounting hole patterns

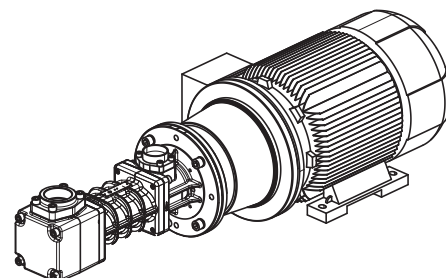
TFS6



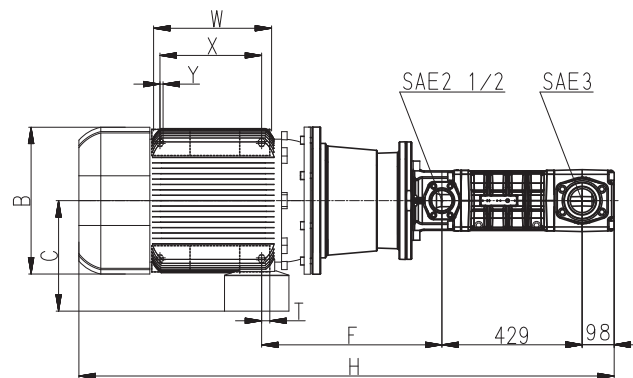
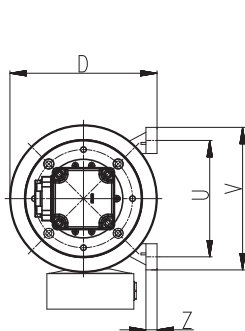
All corners must be deburred!  
According to ISO 2768-m



< 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
-	7.5	673	262	202	335	252	1292	22.5	265	300	270	225	14	18
15.0 / 18.5	11.0	795	314	237	410	252	1414	20	300	350	305	265	18	18
-	15.0	795	314	237	410	265	1414	20	300	350	305	265	18	18
-	18.5	859	356	286	410	265	1478	20	300	350	305	265	18	18
22.0	-	859	356	286	410	252	1478	20	300	350	305	265	18	18
-	22.0	889	356	286	410	397	1508	20	300	350	305	265	18	18
30.0 / 37.0	-	910	396	315	460	265	1529	25	350	400	350	300	18	20
-	30.0	910	396	315	460	417	1529	25	350	400	350	300	18	20
-	37.0	973	449	338	520	432	1592	25	400	450	385	335	18	20
45.0	-	1015	449	338	450	546	1634	25	356	436	361	311	19	34
-	45.0	1013	449	338	450	546	1632	25	356	436	361	311	19	34
55.0	-	1072	497	410	525	585	1691	30	406	490	409	349	24	40
75.0	-	1163	551	433	555	622	1782	55.5	457	540	479	368	24	40
90.0	-	1163	551	433	555	622	1782	30	457	540	479	419	24	40

# High Pressure Pumps

## BFS1, FFS1 / BFS2, FFS2

### Screw spindles

Pressure max.	2-pole motor rotation speed 3500 RPM							4-pole motor rotation speed 1750 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor		Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	immersion version	foot mounted version		1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>BFS130/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 18.8</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 9.4</b>		-	-	-	-
10	17.3	18.2	0.6	0.6	B 1.5	0.86	39	7.9	8.8	0.3	0.3	0.86	29
20	16.3	17.8	0.9	0.9	B 1.5	1.3	39	6.9	8.4	0.4	0.4	0.86	29
30	15.4	17.5	1.2	1.2	B 1.5	1.75	39	5.9	8	0.6	0.6	0.86	29
40	14.5	17.1	1.5	1.5	B 1.75	1.75	39	5	7.7	0.7	0.8	1.27	31
50	13.6	16.7	1.8	1.9	B 1.95	2.55	39	4	7.3	0.9	1.0	1.27	31
60	12.7	16.4	2.1	2.2	B 2.2	2.55	43	3.2	7	1.0	1.1	1.27	31
70	11.9	16	2.4	2.5	B 2.55	3.45	43	-	6.6	-	1.3	1.75	34
80	11.1	15.7	2.8	2.9	B 3.0	3.45	44	-	6.3	-	1.5	1.75	34
90	10.4	15.4	3.1	3.2	B 3.8	3.45	54	-	6	-	1.6	1.75	34
100	9.6	15.1	3.4	3.5	B 3.8	4.6	54	-	5.6	-	1.8	2.55	41
110	8.7	14.7	3.7	3.9	B 4.6	4.6	57	-	5.3	-	2.0	2.55	41
120	7.8	14.4	4.0	4.2	B 4.6	4.6	57	-	5	-	2.1	2.55	41
130	-	14.1	-	4.5	B 4.6	6.3	57	-	-	-	-	-	-
140	-	13.8	-	4.9	B 5.75	6.3	73	-	-	-	-	-	-
150	-	13.5	-	5.2	B 5.75	6.3	73	-	-	-	-	-	-
<b>BFS140/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 25.2</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 12.6</b>		-	-	-	-
10	23.1	24.4	0.7	0.7	B 1.5	0.86	39	10.5	11.8	0.3	0.4	0.86	29
20	21.8	23.9	1.1	1.2	B 1.5	1.75	39	9.2	11.3	0.5	0.6	0.86	29
30	20.6	23.4	1.5	1.6	B 1.75	1.75	39	8	10.7	0.7	0.8	1.27	31
40	19.5	22.9	1.9	2.0	B 2.2	2.55	43	6.9	10.2	0.9	1.0	1.27	31
50	18.4	22.4	2.4	2.5	B 2.55	3.45	43	5.8	9.8	1.1	1.2	1.75	34
60	17.3	21.9	2.8	2.9	B 3.0	3.45	44	4.7	9.3	1.3	1.5	1.75	34
70	16.4	21.4	3.2	3.3	B 3.8	3.45	54	3.8	8.8	1.5	1.7	2.55	41
80	15.4	20.9	3.6	3.8	B 3.8	4.6	54	-	8.3	-	1.9	2.55	41
90	14.6	20.5	4.0	4.2	B 4.6	4.6	57	-	7.9	-	2.1	2.55	41
100	13.8	20	4.5	4.7	B 5.75	6.3	73	-	7.4	-	2.3	2.55	41
110	12.6	19.6	4.9	5.1	B 5.75	6.3	73	-	7	-	2.5	3.45	46
120	11.6	19.2	5.3	5.5	B 5.75	6.3	73	-	6.5	-	2.7	3.45	46
130	10.6	18.7	5.7	6.0	B 6.3	6.3	73	-	-	-	-	-	-
140	9.7	18.3	6.1	6.4	B 8.6	8.6	81	-	-	-	-	-	-
150	8.8	17.9	6.6	6.9	B 8.6	8.6	81	-	-	-	-	-	-
<b>BFS232/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 31.5</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 15.8</b>		-	-	-	-
10	29.7	30.8	0.8	0.9	B 1.5	1.3	40	13.9	15.1	0.4	0.5	0.86	29
20	29	30.6	1.4	1.4	B 1.75	1.75	40	13.3	14.8	0.7	0.7	0.86	29
30	28.4	30.3	1.9	2.0	B 2.2	2.55	44	12.7	14.6	0.9	1.0	1.27	32
40	27.8	30	2.4	2.5	B 2.55	3.45	44	12.1	14.3	1.2	1.3	1.75	34
50	27.2	29.8	2.9	3.1	B 3.8	3.45	55	11.5	14	1.4	1.5	1.75	34
60	26.6	29.5	3.5	3.6	B 3.8	4.6	55	10.9	13.8	1.7	1.8	2.55	41
70	26	29.3	4.0	4.2	B 4.6	4.6	57	10.3	13.5	2.0	2.1	2.55	41
80	25.4	29	4.5	4.7	B 5.75	6.3	74	9.7	13.3	2.2	2.3	2.55	41
90	24.9	28.7	5.0	5.3	B 5.75	6.3	74	9.1	13	2.5	2.6	3.45	46
100	24.3	28.5	5.6	5.8	B 6.3	6.3	74	8.5	12.7	2.7	2.9	3.45	46
110	23.8	28.3	6.1	6.4	B 8.6	8.6	82	-	12.5	-	3.2	3.45	46
120	23.2	28	6.6	6.9	B 8.6	8.6	82	-	12.3	-	3.4	4.55	53
130	22.7	27.8	7.1	7.5	B 8.6	8.6	82	-	12	-	3.7	4.55	53
140	22.1	27.5	7.7	8.0	B 8.6	8.6	82	-	11.8	-	4.0	4.55	53
150	21.6	27.3	8.2	8.6	B 8.6	12.6	82	-	11.6	-	4.2	4.55	53

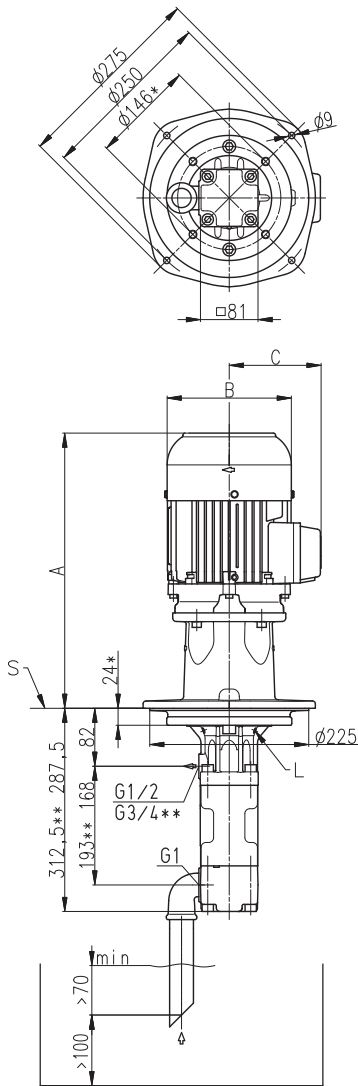
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

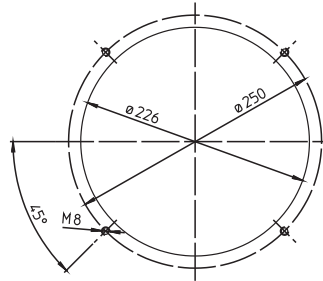
# Characteristics and dimensions

## BFS1, FFS1 / BFS2, FFS2

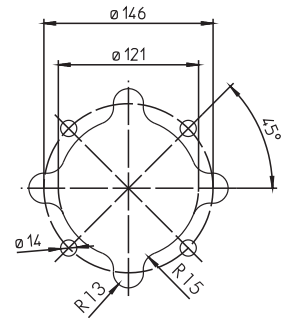


### Mounting hole patterns

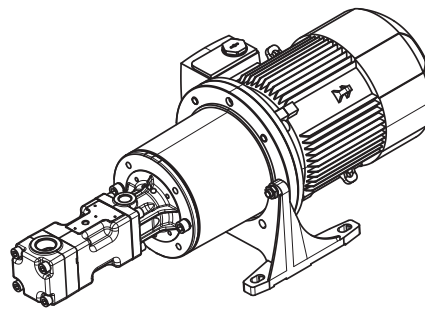
#### BFS1 / BFS2



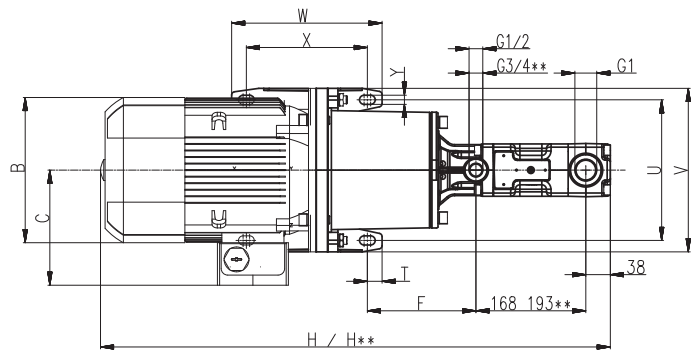
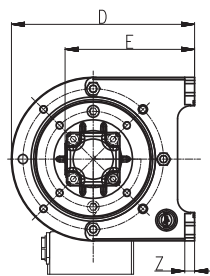
#### TFS1 / TFS2



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



- \*) Dimensions for 4-pole standard motor upon request
- \*\*\*) Dimensions for BFS2
- L = Leakage hole
- S = Mounting plate, please refer to the cut-out of mounting hole



Dimensions H\*\* = H+25 or see page 31

Power 2-poles kW	A mm	B mm	C mm
B 1.5 / 1.75 / 1.95	389	176	130
B 2.2 / 2.55	414	176	130
B 3.0	424	176	130
B 3.8 / 4.6	478	218	150
B 5.75 / 6.3	514	258	190
B 8.6	552	258	190

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
0.86 / 1.3	0.86	159	121	212	155	138	676	15	180	210	90	60	11	12
1.75	1.27 / 1.75	178	126	212	155	138	721	15	180	210	90	60	11	12
2.55	-	180	126	212	155	138	721	15	180	210	90	60	11	12
-	2.55 / 3.45	198	166	280	198	166	786	22.5	215	250	260	185	14	15
3.45	-	198	166	280	198	166	786	22.5	215	250	230	185	14	15
-	4.55	222	177	280	198	166	780	22.5	215	250	260	185	14	15
4.6	-	222	177	280	198	166	780	22.5	215	250	230	185	14	15
6.3 / 8.6	-	262	202	335	228	171	857	22.5	265	300	270	225	14	18
12.6	-	314	237	410	278	210	1026	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		Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	immersion version	foot mounted version		1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>BFS238/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 37.4</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 18.7</b>		-	-	-	-
10	35.2	36.5	0.9	0.9	B 1.5	1.3	40	16.5	17.8	0.4	0.4	0.86	29
20	34.5	36.2	1.6	1.6	B 1.75	1.75	40	15.8	17.5	0.8	0.8	1.27	32
30	33.8	35.9	2.2	2.2	B 2.55	2.55	44	15.1	17.2	1.1	1.1	1.27	32
40	33.1	35.6	2.8	2.9	B 3.0	3.45	44	14.4	16.9	1.4	1.4	1.75	34
50	32.4	35.3	3.4	3.5	B 3.8	4.6	55	13.7	16.6	1.7	1.8	2.55	41
60	31.7	35.1	4.1	4.2	B 4.6	4.6	57	13	16.4	2.0	2.1	2.55	41
70	31	34.8	4.7	4.8	B 5.75	6.3	74	12.3	16.1	2.3	2.4	3.45	46
80	30.3	34.5	5.3	5.5	B 5.75	6.3	74	11.6	15.8	2.6	2.7	3.45	46
90	29.6	34.2	5.9	6.1	B 6.3	6.3	74	10.9	15.5	2.9	3.1	3.45	46
100	29	34	6.6	6.8	B 8.6	8.6	82	10.2	15.3	3.2	3.4	4.55	53
110	28.3	33.7	7.2	7.4	B 8.6	8.6	82	-	15	-	3.7	4.55	53
120	27.6	33.4	7.8	8.1	B 8.6	8.6	82	-	14.7	-	4.1	4.55	53
130	27	33.1	8.4	8.8	B 11.5	12.6	97	-	14.4	-	4.4	6.3	63
140	26.3	32.9	9.0	9.4	B 11.5	12.6	97	-	14.2	-	4.7	6.3	63
150	25.7	32.6	9.7	10.1	B 11.5	12.6	97	-	13.9	-	5.0	6.3	63
<b>BFS250/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 49.2</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 24.6</b>		-	-	-	-
10	46.4	48	1.1	1.2	B 1.75	1.75	40	21.8	23.4	0.5	0.6	0.86	29
20	45.4	47.7	2.0	2.0	B 2.2	2.55	44	20.8	23	1.0	1.0	1.27	32
30	44.5	47.3	2.8	2.9	B 3.0	3.45	44	19.9	22.7	1.4	1.4	1.75	34
40	43.6	46.9	3.6	3.8	B 3.8	4.6	55	19	22.3	1.8	1.9	2.55	41
50	42.7	46.6	4.4	4.6	B 5.75	6.3	74	18.1	21.9	2.2	2.3	2.55	41
60	41.9	46.2	5.2	5.5	B 5.75	6.3	74	17.3	21.6	2.6	2.7	3.45	46
70	41.1	45.8	6.1	6.3	B 8.6	8.6	82	16.5	21.2	3.0	3.2	3.45	46
80	40.3	45.4	6.9	7.2	B 8.6	8.6	82	15.7	20.8	3.4	3.6	4.55	53
90	39.6	45.1	7.7	8.1	B 8.6	8.6	82	14.9	20.4	3.8	4.0	4.55	53
100	38.9	44.7	8.5	8.9	B 11.5	12.6	97	14	20.1	4.2	4.5	6.3	63
110	37.6	44.3	9.3	9.8	B 11.5	12.6	97	-	19.7	-	4.9	6.3	63
120	36.3	43.9	10.2	10.5	B 11.5	12.6	97	-	19.3	-	5.3	6.3	63
130	35.1	43.5	11.0	11.5	B 11.5	12.6	97	-	18.9	-	5.8	6.3	63
140	33.8	43.1	11.8	12.3	-	17.3	101	-	18.5	-	6.2	8.6	78
150	32.6	42.7	12.6	13.2	-	17.3	101	-	18.1	-	6.6	8.6	78
<b>BFS260/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 59</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 29.5</b>		-	-	-	-
10	55.6	57.6	1.3	1.5	B 2.2	2.55	44	26.1	28	0.6	0.7	0.86	29
20	54.4	57	2.3	2.5	B 3.0	3.45	44	24.9	27.5	1.1	1.3	2.55	41
30	53.3	56.4	3.3	3.6	B 3.8	4.6	55	23.8	26.9	1.6	1.8	2.55	41
40	52.1	55.8	4.3	4.6	B 4.6	6.3	57	22.6	26.3	2.1	2.3	2.55	41
50	51	55.2	5.2	5.7	B 5.75	6.3	74	21.5	25.7	2.6	2.9	3.45	46
60	49.8	54.6	6.2	6.7	B 8.6	8.6	82	20.3	25.1	3.1	3.4	4.55	53
70	48.6	54	7.2	7.8	B 8.6	8.6	82	19.1	24.5	3.6	3.9	4.55	53
80	47.5	53.4	8.2	8.8	B 11.5	12.6	97	18	23.9	4.1	4.4	4.55	53
90	46.3	52.8	9.2	9.9	B 11.5	12.6	97	16.8	23.2	4.6	5.0	6.3	63
100	45.1	52.1	10.2	11.0	B 11.5	12.6	97	15.7	22.6	5.1	5.5	6.3	63
110	43.5	51.5	11.2	12.1	-	12.6	97	-	22	-	6.0	8.6	78
120	41.9	50.8	12.1	13.1	-	17.3	101	-	21.3	-	6.6	8.6	78
130	40.2	49.6	13.1	14.2	-	17.3	101	-	-	-	-	-	-
140	38.6	48.3	14.1	15.2	-	17.3	101	-	-	-	-	-	-
150	37	47.1	15.1	16.3	-	17.3	101	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

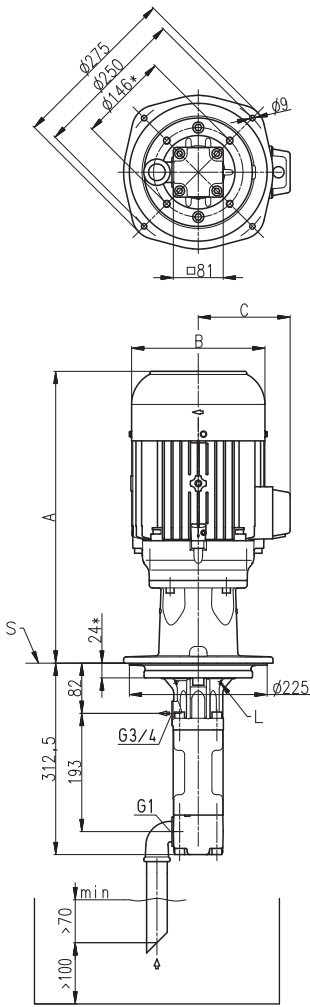
Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

# Characteristics and dimensions

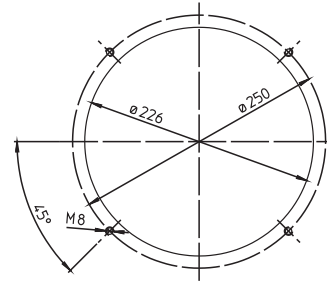
## BFS2, FFS2

60 Hz

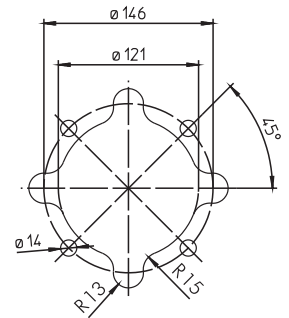


### Mounting hole patterns

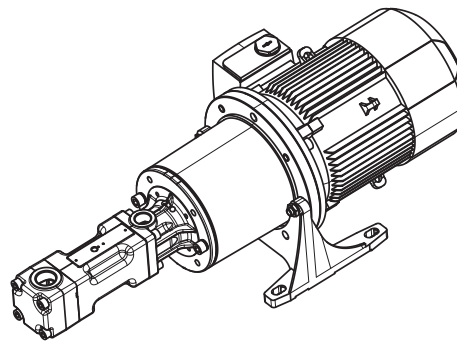
#### BFS1 / BFS2



#### TFS1 / TFS2

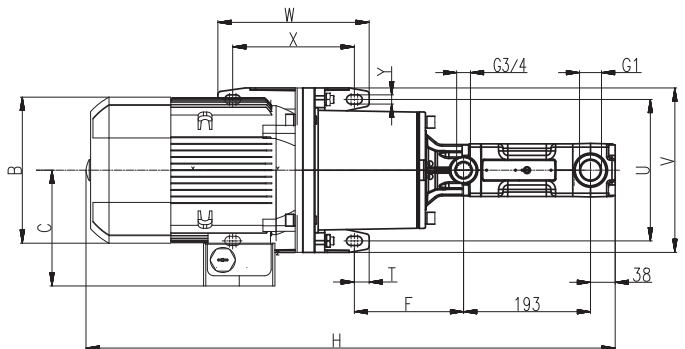
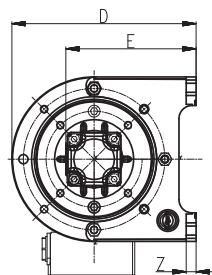


All corners must be deburred!  
According to ISO 2768-m



\*) 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 1.5 / 1.75	389	176	130
B 2.2 / 2.55	414	176	130
B 3.0	424	176	130
B 3.8 / 4.6	478	218	150
B 5.75 / 6.3	514	258	190
B 8.6	552	258	190
B 11.5	602	258	190



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
1.3	0.86	159	121	212	155	138	701	15	180	210	90	60	11	12
1.75	1.27 / 1.75	178	126	212	155	138	746	15	180	210	90	60	11	12
2.55	-	180	126	212	155	138	746	15	180	210	90	60	11	12
-	2.55 / 3.45	198	166	280	198	166	811	22.5	215	250	260	185	14	15
3.45	-	198	166	280	198	166	811	22.5	215	250	230	185	14	15
-	4.55	222	177	280	198	166	805	22.5	215	250	260	185	14	15
4.6	-	222	177	280	198	166	805	22.5	215	250	230	185	14	15
6.3 / 8.6	6.3 / 8.6	262	202	335	228	171	882	22.5	265	300	270	225	14	18
12.6 / 17.3	-	314	237	410	278	210	1051	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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS348/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 77.4</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 38.7</b>		-	-	-	-
10	73.3	75.6	1.8	1.9	2.55	47	34.6	36.9	0.8	0.8	1.27	44
20	71.8	74.7	3.1	3.3	4.6	63	33.1	36	1.5	1.5	1.75	46
30	70.3	73.9	4.4	4.6	6.3	73	31.7	35.3	2.1	2.2	2.55	53
40	69	73.2	5.7	6.0	8.6	86	30.3	34.5	2.8	2.9	3.45	58
50	67.6	72.5	6.9	7.3	8.6	86	28.9	33.8	3.4	3.6	4.55	65
60	66.4	71.8	8.2	8.6	12.6	104	27.7	33.1	4.1	4.3	4.55	65
70	65.2	71.1	9.5	10.0	12.6	104	26.5	32.4	4.7	5.0	6.3	75
80	64	70.5	10.8	11.3	12.6	104	25.3	31.8	5.4	5.7	6.3	75
90	62.9	69.9	12.1	12.7	17.3	113	24	31.3	6.0	6.4	8.6	90
100	61.9	69.4	13.4	14.0	17.3	113	22.8	30.7	6.7	7.1	8.6	90
110	60	68.9	14.7	15.3	17.3	113	-	30.2	-	7.8	8.6	90
120	58.2	68.4	15.9	16.7	17.3	113	-	29.8	-	8.5	12.6	112
130	56.6	68	17.2	18.0	21.3	133	-	29.3	-	9.2	12.6	112
140	54.9	67.6	18.5	19.3	21.3	133	-	28.9	-	9.9	12.6	112
150	53.3	67.3	19.8	20.7	25.3	162	-	28.6	-	10.6	12.6	112
<b>TFS364/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 103.2</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 51.6</b>		-	-	-	-
10	97.5	100.7	2.2	2.4	4.6	63	45.9	49.1	1.1	1.1	1.27	44
20	95.8	99.7	3.9	4.2	6.3	73	44.2	48.1	1.9	2.0	2.55	53
30	94	98.7	5.7	6.0	8.6	86	42.4	47.1	2.8	2.9	3.45	58
40	92.3	97.8	7.4	7.7	12.6	104	40.7	46.2	3.6	3.8	4.55	65
50	90.7	96.9	9.1	9.5	12.6	104	39.1	45.3	4.5	4.7	6.3	75
60	89.1	96.1	10.8	11.3	12.6	104	37.5	44.5	5.4	5.6	6.3	75
70	87.5	95.3	12.5	13.1	17.3	113	35.9	43.7	6.2	6.5	8.6	90
80	86	94.5	14.3	14.9	17.3	113	34.4	42.9	7.1	7.4	8.6	90
90	84.6	93.8	16.0	16.7	17.3	113	32.8	42.2	7.9	8.3	8.6	90
100	83.2	93.2	17.7	18.4	21.3	133	31.2	41.6	8.8	9.2	12.6	112
110	80.9	92.5	19.4	20.2	21.3	133	-	40.9	-	10.1	12.6	112
120	78.6	91.9	21.2	22.0	25.3	162	-	40.3	-	11.0	12.6	112
130	76.4	90.4	22.9	23.8	33.5	219	-	-	-	-	-	-
140	74.3	89	24.6	25.6	33.5	219	-	-	-	-	-	-
150	72.2	87.5	26.3	27.3	33.5	219	-	-	-	-	-	-
<b>TFS376/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 122.5</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 61.3</b>		-	-	-	-
10	116.2	119.5	2.5	2.8	6.3	73	55	58.3	1.2	1.3	1.75	46
20	114.1	118.3	4.6	4.9	8.6	86	52.8	57.1	2.2	2.4	3.45	58
30	112	117.2	6.6	7.1	8.6	86	50.8	55.9	3.3	3.5	4.55	65
40	110	116.1	8.7	9.2	12.6	104	48.7	54.9	4.3	4.6	6.3	75
50	108	115.1	10.7	11.3	12.6	104	46.7	53.8	5.3	5.7	6.3	75
60	106	114.1	12.8	13.5	17.3	113	44.8	52.9	6.3	6.7	8.6	90
70	104.1	113.2	14.8	15.6	17.3	113	42.8	51.9	7.3	7.8	8.6	90
80	102.2	112.3	16.8	17.8	21.3	133	40.9	51	8.4	8.9	12.6	112
90	100.3	111.4	18.9	19.9	21.3	133	38.9	50.2	9.4	10.0	12.6	112
100	98.5	110.6	20.9	22.0	25.3	162	37	49.4	10.4	11.1	12.6	112
110	95.5	109.9	23.0	24.2	33.5	219	-	48.6	-	12.2	17.3	138
120	92.6	109.2	25.0	26.3	33.5	219	-	48	-	13.3	17.3	138
130	89.8	107.4	27.1	28.5	33.5	219	-	-	-	-	-	-
140	87	105.7	29.1	30.6	33.5	219	-	-	-	-	-	-
150	84.2	104	31.1	32.7	41.5	248	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Higher pressures (up to 200 bar) upon request.

Viscosity > 20 mm<sup>2</sup>/s more power consumption.



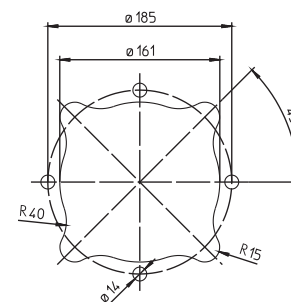
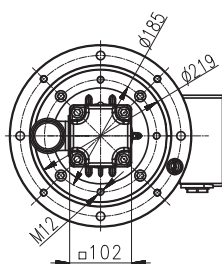
# Characteristics and dimensions

## TFS3, FFS3

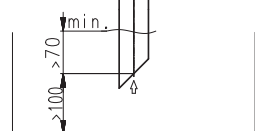
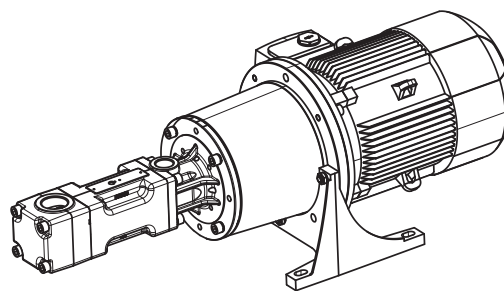
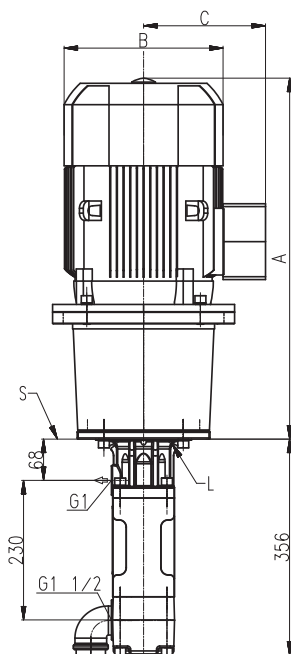
60 Hz

Mounting hole patterns

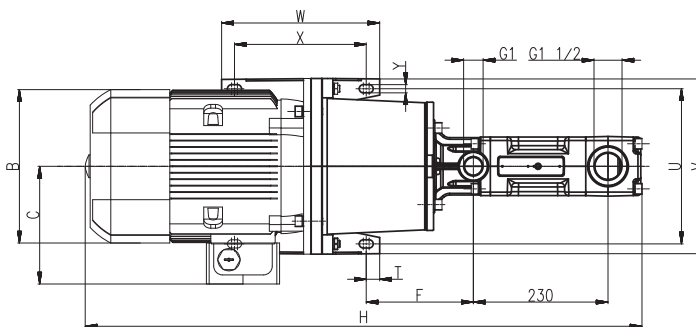
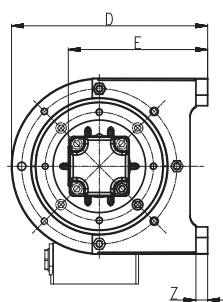
TFS3 / TFS4



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 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
-	1.27	476	178	126	212	165	152	832	15	180	210	90	60	11	12
-	1.75	533	178	126	212	165	152	832	15	180	210	90	60	11	12
2.55	-	476	180	126	212	165	152	832	15	180	210	90	60	11	12
-	2.55	526	198	166	280	208	186	889	22.5	215	250	260	185	14	15
-	3.45	595	198	166	280	208	186	889	22.5	215	250	260	185	14	15
-	4.55	595	222	177	280	208	186	882	22.5	215	250	260	185	14	15
4.6	-	526	222	177	280	208	186	882	22.5	215	250	230	185	14	15
6.3 / 8.6	-	595	262	202	335	238	183	951	22.5	265	300	270	225	14	18
-	6.3 / 8.6	764	262	202	335	238	183	951	22.5	265	300	270	225	14	18
12.6 / 17.3 / 21.3	12.6	764	314	237	410	288	222	1120	20	300	350	305	265	18	18
-	17.3	828	314	237	410	288	222	1120	20	300	350	305	265	18	18
25.3	-	828	356	286	410	288	222	1184	20	300	350	305	265	18	18
33.5 / 41.5	-	881	396	315	460	313	212	1237	25	350	400	350	300	18	20

# High Pressure Pumps

## TFS4, FFS4

### Screw spindles

60 Hz

Pressure max.	2-pole motor rotation speed 3500 RPM						4-pole motor rotation speed 1750 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS460/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 151.2</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 75.6</b>		-	-	-	-
10	144	147	3.3	3.7	4.6	74	68	72	1.6	1.6	2.55	64
20	141	146	5.8	6.4	8.6	96	65	70	2.8	2.9	3.45	64
30	138	144	8.4	9.0	12.6	115	63	69	4.1	4.3	4.55	76
40	136	143	10.9	11.7	12.6	115	60	67	5.3	5.6	6.3	85
50	133	142	13.4	14.4	17.3	124	57	66	6.6	7.0	8.6	100
60	131	140	15.9	17.0	21.3	144	55	65	7.9	8.4	8.6	100
70	128	139	18.4	19.7	21.3	144	53	63	9.1	9.7	12.6	123
80	126	138	21.0	22.3	25.3	173	50	62	10.4	11.1	12.6	123
90	124	137	23.5	25.0	33.5	230	48	61	11.6	12.4	17.3	149
100	122	136	26.0	27.7	33.5	230	45	60	12.9	13.8	17.3	149
110	120	135	28.5	30.3	33.5	230	-	59	-	15.2	17.3	149
120	117	134	31.1	33.0	41.5	259	-	58	-	16.5	17.3	149
<b>TFS480/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 201.7</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 100.8</b>		-	-	-	-
10	192	197	4.2	4.9	6.3	83	91	96	2.0	2.1	2.55	64
20	188	194	7.5	8.5	12.6	115	87	94	3.7	3.9	4.55	76
30	184	192	10.9	12.1	17.3	124	84	91	5.3	5.7	6.3	85
40	181	190	14.2	15.6	17.3	124	80	89	7.0	7.5	8.6	100
50	178	188	17.6	19.2	21.3	144	77	88	8.7	9.3	12.6	123
60	175	187	21.0	22.8	25.3	173	74	86	10.4	11.1	12.6	123
70	172	185	24.3	26.4	33.5	230	71	84	12.1	12.9	17.3	149
80	169	183	27.7	30.0	33.5	230	68	83	13.7	14.7	17.3	149
90	166	182	31.1	33.6	41.5	259	65	81	15.4	16.5	17.3	149
100	164	181	34.4	37.1	41.5	259	62	80	17.1	18.3	21.3	168
110	161	180	37.8	40.7	41.5	259	-	79	-	20.1	21.3	168
120	158	179	41.1	44.3	51.0	374	-	78	-	21.9	25.3	188
<b>TFS496/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 242</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 121</b>		-	-	-	-
10	231	235	4.8	5.6	8.6	96	110	114	2.3	2.7	3.45	64
20	226	233	8.9	9.9	12.6	115	105	112	4.3	4.8	6.3	85
30	222	231	12.9	14.2	17.3	124	101	110	6.3	7.0	8.6	100
40	218	229	16.9	18.5	21.3	144	97	108	8.4	9.1	12.6	123
50	214	227	21.0	22.8	25.3	173	93	106	10.4	11.3	12.6	123
60	211	225	25.0	27.1	33.5	230	90	104	12.4	13.5	17.3	149
70	207	224	29.0	31.4	33.5	230	86	103	14.4	15.6	17.3	149
80	204	222	33.1	35.7	41.5	259	83	101	16.4	17.8	21.3	168
90	201	220	37.1	40.0	41.5	259	79	99	18.4	19.9	21.3	168
100	198	219	41.1	44.3	51.0	374	76	98	20.5	22.1	25.3	188
110	195	217	45.2	48.6	51.0	374	-	96	-	24.3	34.5	244
120	191	215	49.2	52.9	62.0	469	-	94	-	26.4	34.5	244

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

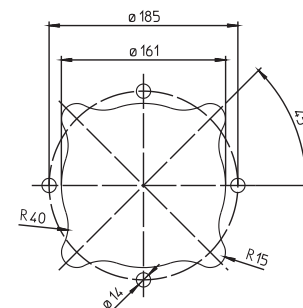
# Characteristics and dimensions

## TFS4, FFS4

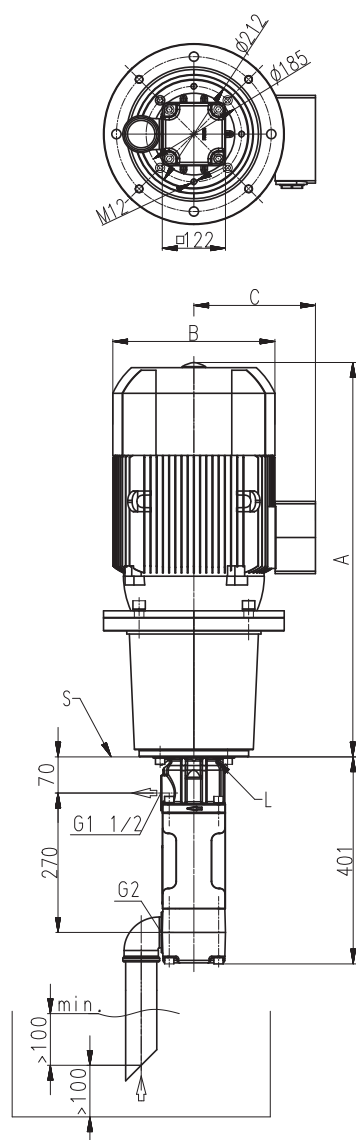
60 Hz

Mounting hole patterns

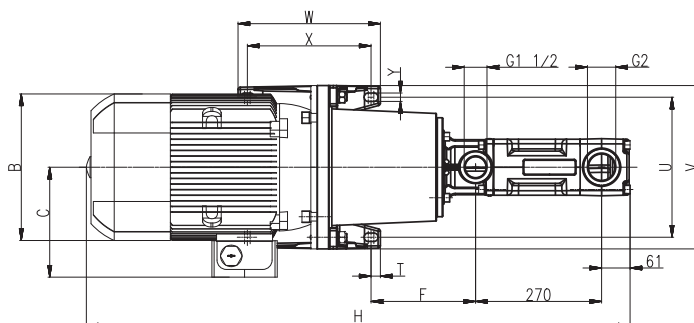
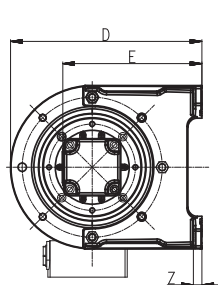
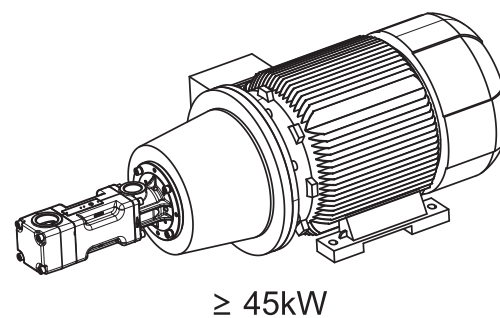
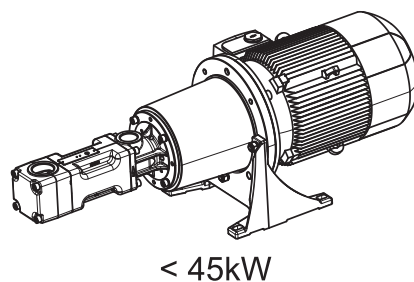
TFS3 / TFS4



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



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
-	2.55 / 3.45	533	198	166	280	218	188	934	22.5	215	250	230	185	14	15
4.6	4.55	526	222	177	280	218	188	927	22.5	215	250	230	185	14	15
6.3 / 8.6	6.3 / 8.6	609	262	202	335	248	199	1010	22.5	265	300	270	225	14	18
12.6 / 17.3 / 21.3	12.6 / 17.3	764	314	237	410	298	224	1165	20	300	350	305	265	18	18
25.3	21.3	828	356	286	410	298	224	1229	20	300	350	305	265	18	18
-	25.3	858	356	286	410	298	224	1259	20	300	350	305	265	18	18
33.5 / 41.5	34.5	881	396	315	460	323	214	1282	25	350	400	350	300	18	20
51.0	-	986	449	338	450	288	495	1387	25	356	436	361	311	19	34
62.0	-	1056	497	410	525	313	547	1457	30	406	490	409	349	24	40

# High Pressure Pumps

## TFS5, FFS5

### Screw spindles



Pressure max.	2-pole motor rotation speed 3500 RPM						4-pole motor rotation speed 1750 RPM					
	Flow at viscosity		Power consumption at viscosity		Motor	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS574/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 291.6</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 145.8</b>		-	-	-	-
10	280	285	6.2	7.0	8.6	125	134	139	2.9	3.4	4.55	105
20	276	283	11.0	12.1	17.3	153	130	137	5.4	6.0	8.6	129
30	272	281	15.9	17.2	21.3	173	126	135	7.8	8.5	12.6	152
40	269	279	20.7	22.2	25.3	202	123	134	10.2	11.1	12.6	152
50	266	278	25.6	27.3	33.5	259	120	132	12.6	13.7	17.3	178
60	262	276	30.5	32.4	33.5	259	117	130	15.1	16.2	17.3	178
70	260	274	35.3	37.5	41.5	288	114	129	17.5	18.8	21.3	197
80	257	273	40.2	42.6	51.0	403	111	127	19.9	21.4	25.3	217
90	254	271	45.0	47.7	51.0	403	108	126	22.3	23.9	25.3	217
100	252	270	49.9	52.7	62.0	498	105	124	24.8	26.5	34.5	273
110	249	269	54.7	57.8	62.0	498	-	123	-	29.1	34.5	273
120	247	267	59.6	62.9	84.0	608	-	122	-	31.6	34.5	273
<b>TFS5100/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 394.1</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 197</b>		-	-	-	-
10	378	386	7.9	8.7	12.6	144	181	189	3.8	4.3	6.3	114
20	374	383	14.4	15.6	21.3	173	177	186	7.1	7.8	8.6	129
30	370	381	21.0	22.6	25.3	202	173	184	10.4	11.3	12.6	152
40	366	379	27.6	29.5	33.5	259	169	182	13.6	14.8	17.3	178
50	362	377	34.1	36.4	41.5	288	165	180	16.9	18.3	21.3	197
60	358	375	40.7	43.4	51.0	403	161	178	20.2	21.8	25.3	217
70	355	373	47.3	50.3	62.0	498	158	176	23.5	25.3	34.5	273
80	351	371	53.8	57.3	62.0	498	154	174	26.8	28.8	34.5	273
90	348	369	60.4	64.2	84.0	608	150	172	30.1	32.3	34.5	273
100	345	368	67.0	71.1	84.0	608	147	171	33.3	35.8	42.5	363
110	342	366	73.5	78.1	84.0	608	-	169	-	39.3	42.5	363
120	338	365	80.1	85.0	101.0	693	-	168	-	42.8	52.0	403

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

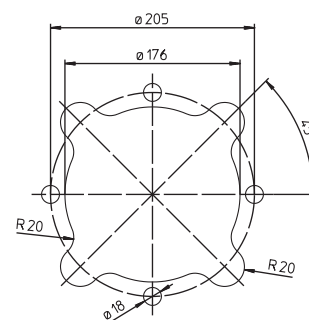
# Characteristics and dimensions

## TFS5, FFS5

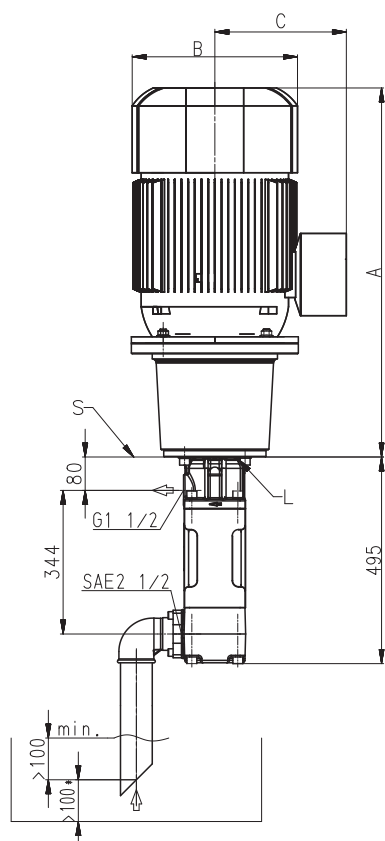
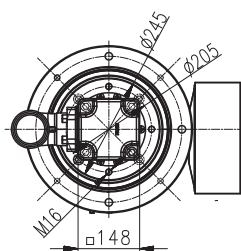
60 Hz

### Mounting hole patterns

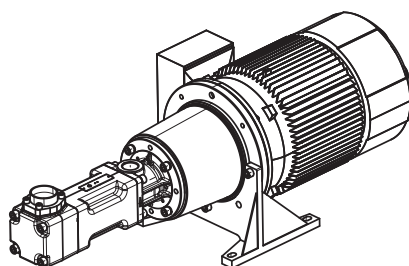
#### TFS5



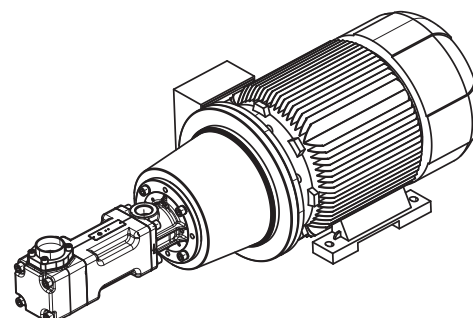
All corners must be deburred! According to ISO 2768-m



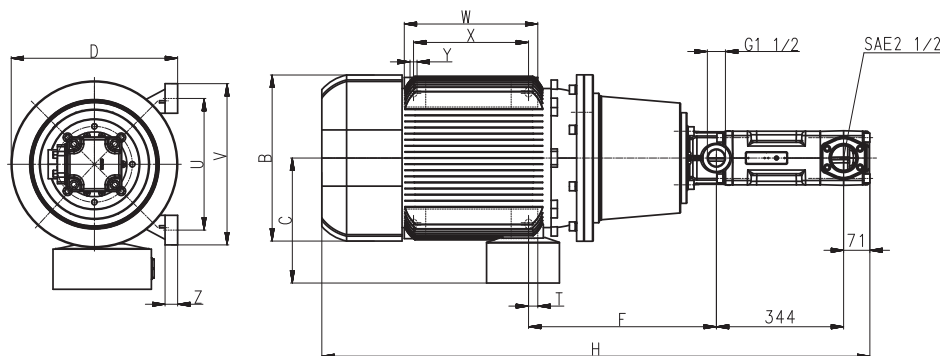
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 45kW



≥ 45kW



Power 2-poles kW	Power 4-poles kW	A 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
-	4.55	556	222	177	280	228	1051	22.5	215	250	230	185	14	15
8.6	6.3 / 8.6	622	262	202	335	222	1117	22.5	265	300	270	225	14	18
12.6 / 17.3 / 21.3	12.6 / 17.3	767	314	237	410	237	1262	20	300	350	305	265	18	18
25.3	21.3	831	356	286	410	237	1326	20	300	350	305	265	18	18
-	25.3	861	356	286	410	237	1356	20	300	350	305	265	18	18
33.5 / 41.5	34.5	884	396	315	460	227	1379	25	350	400	350	300	18	20
-	42.5	927	449	338	520	223	1422	25	400	450	385	335	18	20
51.0	-	989	449	338	450	508	1484	25	356	436	361	311	19	34
-	52.0	987	449	338	450	508	1482	25	356	436	361	311	19	34
62.0	-	1059	497	410	525	560	1554	30	406	490	409	349	24	40
84.0	-	1135	551	433	555	582	1630	55.5	457	540	479	368	24	40
101.0	-	1135	551	433	555	582	1630	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 <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
TFS5120/	Q <sub>Th</sub> <sup>1)</sup> 472.9		-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 236.4		-	-	-	-
10	453	463	9.2	10.0	12.6	144	217	227	4.4	5.0	6.3	114
20	447	460	17.1	18.4	21.3	173	211	223	8.4	9.2	12.6	152
30	442	457	24.9	26.7	33.5	259	205	220	12.3	13.4	17.3	178
40	436	454	32.8	35.1	41.5	288	200	218	16.3	17.6	21.3	197
50	431	452	40.7	43.5	51.0	403	195	215	20.2	21.8	25.3	217
60	426	449	48.6	51.9	62.0	498	190	213	24.1	26.1	34.5	273
70	421	447	56.5	60.2	62.0	498	185	210	28.1	30.3	34.5	273
80	417	445	64.3	68.6	84.0	608	180	208	32.0	34.5	42.5	363
90	412	443	72.2	77.0	84.0	608	175	206	36.0	38.7	42.5	363
100	408	441	80.1	85.4	101.0	693	170	205	39.9	42.9	52.0	403
110	403	440	88.0	93.7	101.0	693	-	203	-	47.1	52.0	403
120	399	438	95.8	102.1	123.0	868	-	202	-	51.3	63.0	468
TFS5130/	Q <sub>Th</sub> <sup>1)</sup> 512.3		-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 256.1		-	-	-	-
10	491	500	9.8	11.7	17.3	153	235	243	4.8	5.4	6.3	114
20	484	495	18.4	20.3	25.3	202	228	239	9.0	9.8	12.6	152
30	477	490	26.9	29.0	33.5	259	221	234	13.3	14.2	17.3	178
40	471	486	35.5	37.6	41.5	288	215	230	17.6	18.6	25.3	217
50	465	482	44.0	46.2	51.0	403	209	225	21.8	23.0	25.3	217
60	459	477	52.5	54.8	62.0	498	203	221	26.1	27.3	34.5	273
70	454	474	61.1	63.5	84.0	608	198	217	30.4	31.7	34.5	273
80	449	470	69.6	72.1	84.0	608	193	214	34.7	36.1	42.5	363
90	444	466	78.1	80.7	84.0	608	187	210	38.9	40.5	52.0	403
100	440	463	86.7	89.3	101.0	693	182	207	43.2	44.9	52.0	403
110	-	460	-	98.0	123.0	868	-	204	-	49.3	63.0	468
120	-	457	-	106.6	123.0	868	-	201	-	53.7	63.0	468

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Viscosity > 20 mm<sup>2</sup>/s more power consumption.

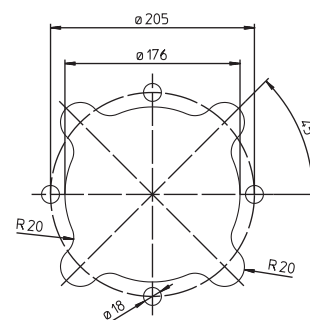
# Characteristics and dimensions

## TFS5, FFS5

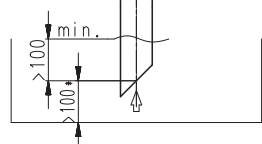
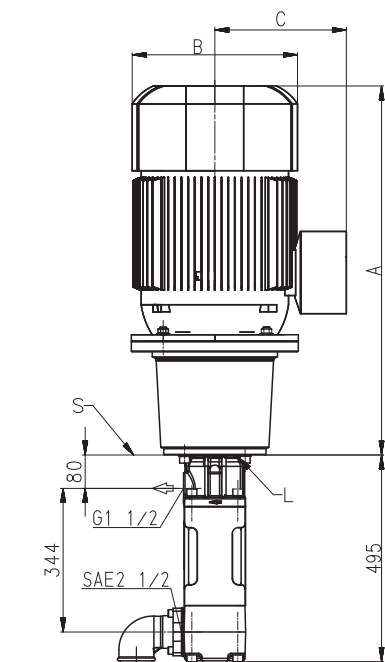
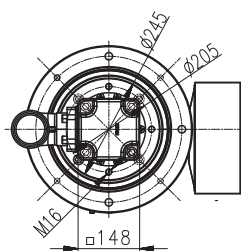
60 Hz

### Mounting hole patterns

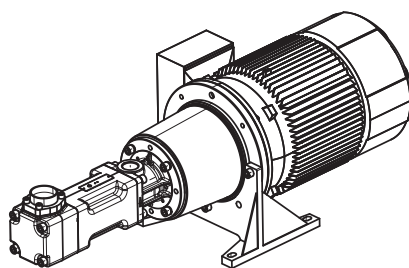
#### TFS5



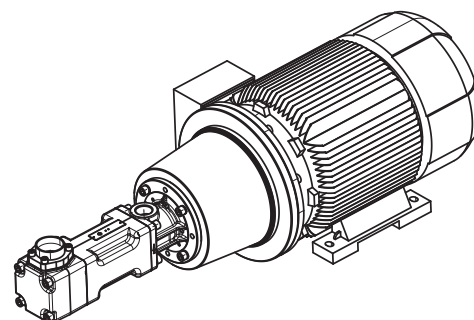
All corners must be deburred! According to ISO 2768-m



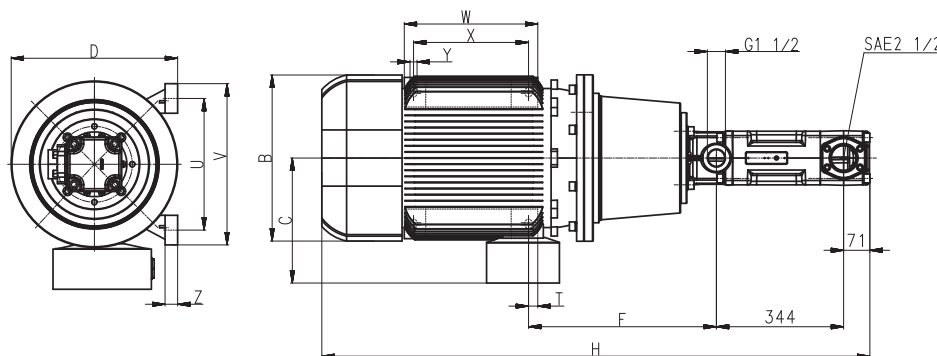
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 45kW



≥ 45kW



Power 2-poles kW	Power 4-poles kW	A 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
-	6.3	622	262	202	335	222	1117	22.5	265	300	270	225	14	18
12.6 / 17.3 / 21.3	12.6 / 17.3	767	314	237	410	237	1262	20	300	350	305	265	18	18
25.3	21.3	831	356	286	410	237	1326	20	300	350	305	265	18	18
-	25.3	861	356	286	410	237	1356	20	300	350	305	265	18	18
33.5 / 41.5	34.5	884	396	315	460	227	1379	25	350	400	350	300	18	20
-	42.5	927	449	338	520	223	1422	25	400	450	385	335	18	20
51.0	-	989	449	338	450	508	1484	25	356	436	361	311	19	34
-	52.0	987	449	338	450	508	1482	25	356	436	361	311	19	34
62.0	63.0	1059	497	410	525	560	1554	30	406	490	409	349	24	40
84.0	-	1135	551	433	555	582	1630	55.5	457	540	479	368	24	40
101.0	-	1135	551	433	555	582	1630	30	457	540	479	419	24	40
123.0	-	1239	616	515	645	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 immersion version	Weight	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s			1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s	1 mm <sup>2</sup> /s	20 mm <sup>2</sup> /s		
Type / bar	l/min	l/min	kW	kW	kW	kg	l/min	l/min	kW	kW	kW	kg
<b>TFS690/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 554</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 277</b>		–	–	–	–
10	540	545	11.6	13.3	17.3	213	263	268	5.6	6.2	8.6	190
20	532	540	20.9	22.6	25.3	262	255	263	10.2	10.8	12.6	212
30	524	535	30.1	31.8	33.5	319	247	258	14.9	15.5	17.3	238
40	516	531	39.3	41.0	51.0	464	239	254	19.5	20.1	25.3	277
50	509	527	48.6	50.3	62.0	559	232	250	24.1	24.7	34.5	333
60	502	523	57.8	59.5	62.0	559	225	246	28.7	29.3	34.5	333
70	496	519	67.0	68.7	84.0	669	219	242	33.3	33.9	42.5	424
80	490	515	76.3	78.0	84.0	669	213	238	37.9	38.5	42.5	424
<b>TFS6120/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 739</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 369</b>		–	–	–	–
10	720	726	14.7	16.4	21.3	233	351	357	7.2	7.8	12.6	212
20	710	721	27.0	28.7	33.5	319	341	351	13.3	13.9	17.3	238
30	701	715	39.3	41.0	51.0	464	331	346	19.5	20.1	21.3	257
40	692	710	51.6	53.3	62.0	559	322	340	25.6	26.2	34.5	333
50	683	704	64.0	65.7	84.0	669	314	335	31.8	32.4	34.5	333
60	676	699	76.3	78.0	84.0	669	306	330	37.9	38.5	42.5	424
70	668	695	88.6	90.3	101.0	754	299	325	44.1	44.7	52.0	464
80	659	689	101.0	103.0	123.0	929	290	320	50.2	50.8	63.0	529
<b>TFS6145/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 893</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 446</b>		–	–	–	–
10	870	878	17.3	19.0	25.3	262	424	432	8.4	9.0	12.6	212
20	857	868	32.2	33.9	41.5	348	411	422	15.9	16.5	21.3	257
30	845	859	47.0	48.7	62.0	559	398	413	23.3	23.9	34.5	333
40	833	851	61.9	63.6	84.0	669	386	405	30.8	31.4	34.5	333
50	822	844	76.8	78.5	84.0	669	375	397	38.2	38.8	42.5	424
60	811	837	91.7	93.4	101.0	754	365	391	45.6	46.2	52.0	464
70	799	829	106.6	108.3	123.0	929	353	382	53.1	53.7	63.0	529

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate

Viscosity > 20 mm<sup>2</sup>/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.



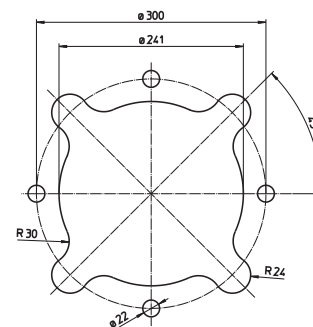
# Characteristics and dimensions

## TFS6, FFS6

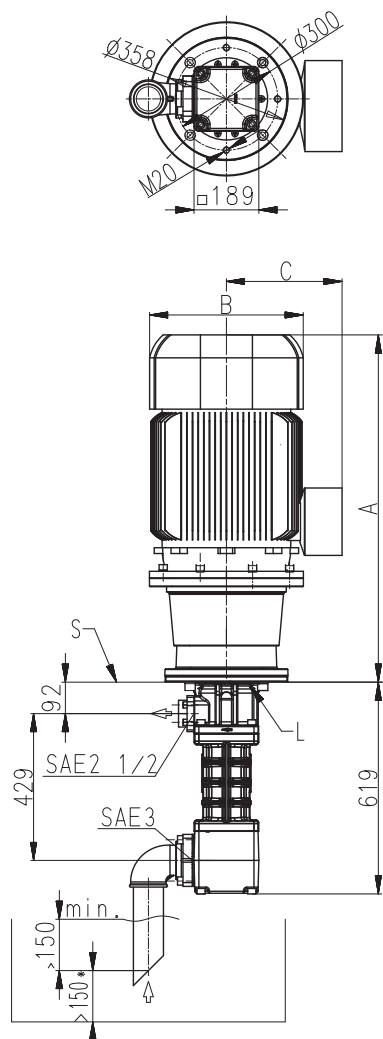
60 Hz

Mounting hole patterns

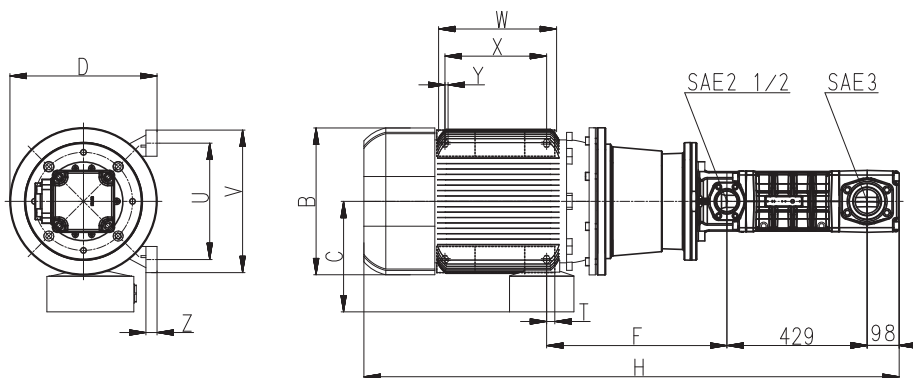
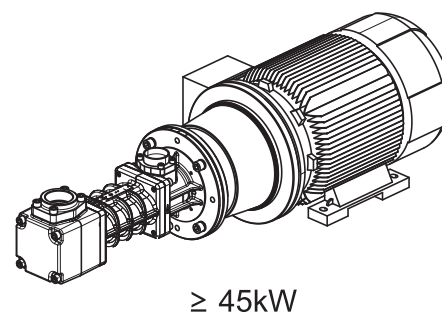
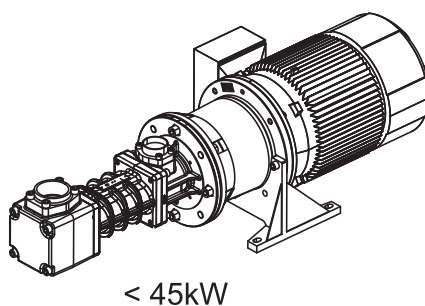
TFS6



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



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	F mm	H mm	T mm	U mm	V mm	W mm	X mm	Y mm	Z mm
-	8.6	673	262	202	335	252	1292	22.5	265	300	270	225	14	18
17.3 / 21.3	12.6	795	314	237	410	252	1414	20	300	350	305	265	18	18
-	17.3	795	314	237	410	265	1414	20	300	350	305	265	18	18
-	21.3	859	356	286	410	265	1478	20	300	350	305	265	18	18
25.3	-	859	356	286	410	252	1478	20	300	350	305	265	18	18
-	25.3	889	356	286	410	397	1508	20	300	350	305	265	18	18
33.5 / 41.5	-	910	396	315	460	265	1529	25	350	400	350	300	18	20
-	34.5	910	396	315	460	417	1529	25	350	400	350	300	18	20
-	42.5	973	449	338	520	432	1592	25	400	450	385	335	18	20
51.0	-	1015	449	338	450	546	1634	25	356	436	361	311	19	34
-	52.0	1013	449	338	450	546	1632	25	356	436	361	311	19	34
62.0	-	1072	497	410	525	585	1691	30	406	490	409	349	24	40
-	63.0	1087	497	410	525	600	1706	30	406	490	409	349	24	40
84.0	-	1163	551	433	555	622	1782	55.5	457	540	479	368	24	40
101.0	-	1163	551	433	555	622	1782	30	457	540	479	419	24	40

## Valves

### Adjustable Pressure Relief Valves

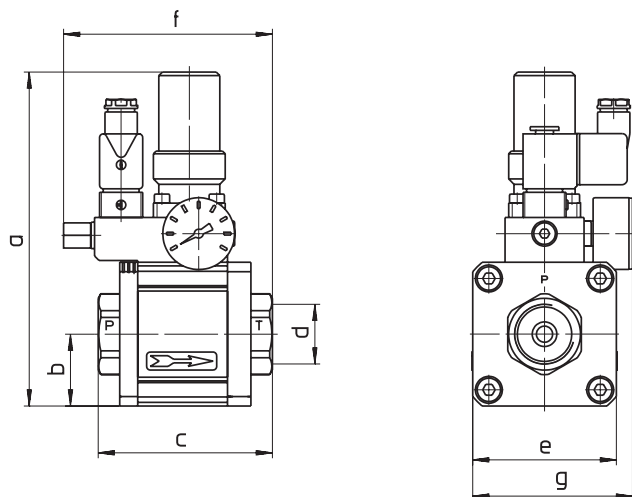
Adjustable pressure relief valves allow for variable operating pressures anywhere between 5 – 120 bar. In order to prevent overloading of the motor, however, the maximum operating pressure may never exceed the highest allowable operating pressure for the specific pump and motor combination in use.

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.

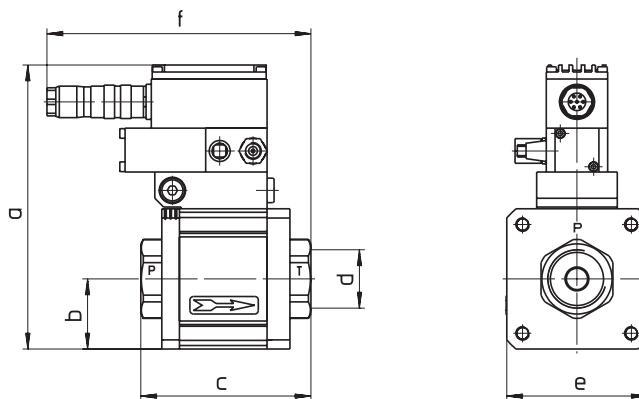
Without power and air supply the valve is fully open and in dump mode.



#### 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 <sup>3</sup> / <sub>8</sub>	Ø 74	–	–
S / H 15	186	40	97	G1	□ 80	116.3	89
S / H 32	231	60	160	G1 <sup>1</sup> / <sub>2</sub>	□ 120	125	109
S 50	251	70	160	G1 <sup>1</sup> / <sub>2</sub>	□ 140	–	–

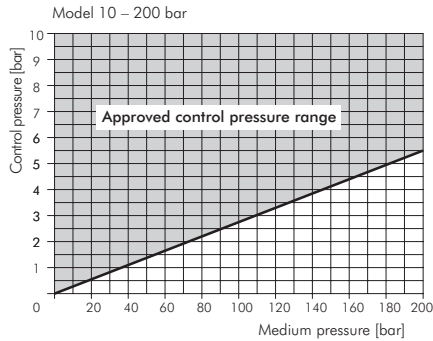
Type SPB	a mm	b mm	c mm	d mm	e mm	f mm
08	151	37	138	G <sup>3</sup> / <sub>8</sub>	Ø 74	–
S / H 15	162	40	97	G1	□ 80	150.5
S / H 32	192.5	60	160	G1 <sup>1</sup> / <sub>2</sub>	□ 120	176.5
S 50	251	70	160	G1 <sup>1</sup> / <sub>2</sub>	□ 140	–

Further valves on request.

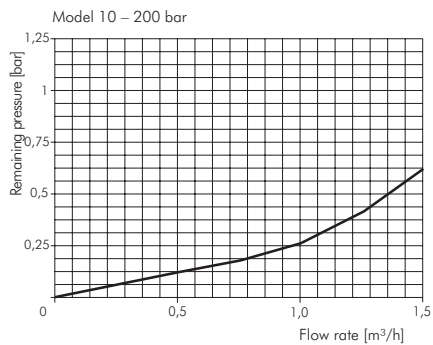
## Valves

### 3-HPB – 08 | SPB – 08

#### Control pressure diagram

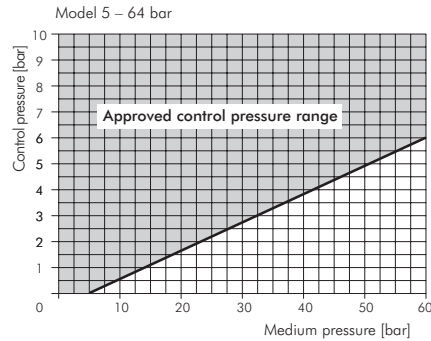


#### Depressurized recirculation mode

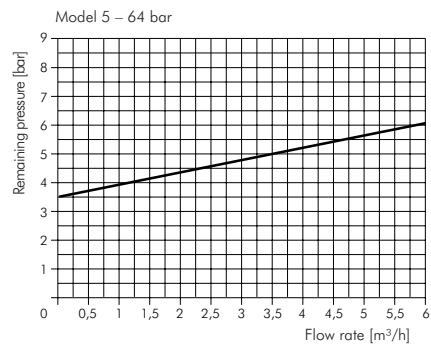


### 3 – HPB – S 15 | SPB – S 15

#### Control pressure diagram

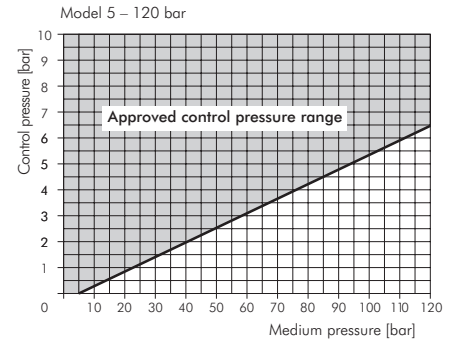


#### Depressurized recirculation mode

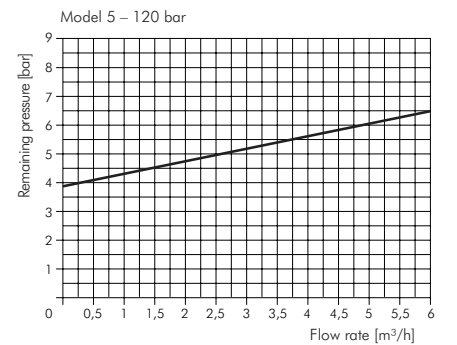


### 3 – HPB – H 15 | SPB – H 15

#### Control pressure diagram

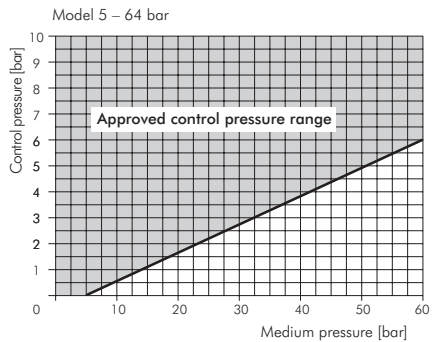


#### Depressurized recirculation mode

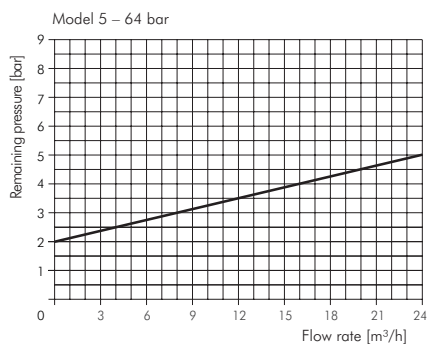


### 3 – HPB – S 32 | SPB – S 32

#### Control pressure diagram

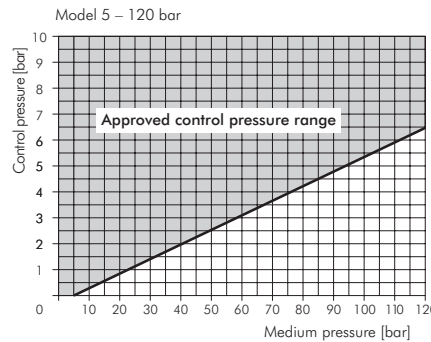


#### Depressurized recirculation mode

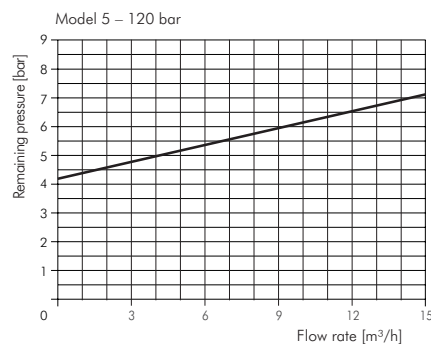


### 3 – HPB – H 32 | SPB – H 32

#### Control pressure diagram

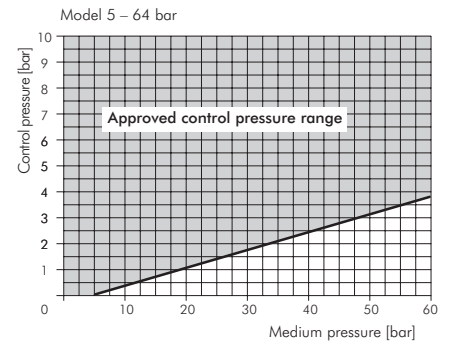


#### Depressurized recirculation mode

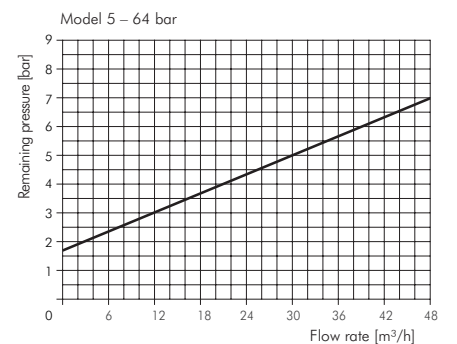


### 3 – HPB – S 50 | SPB – S 50

#### 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 1 – 3 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.

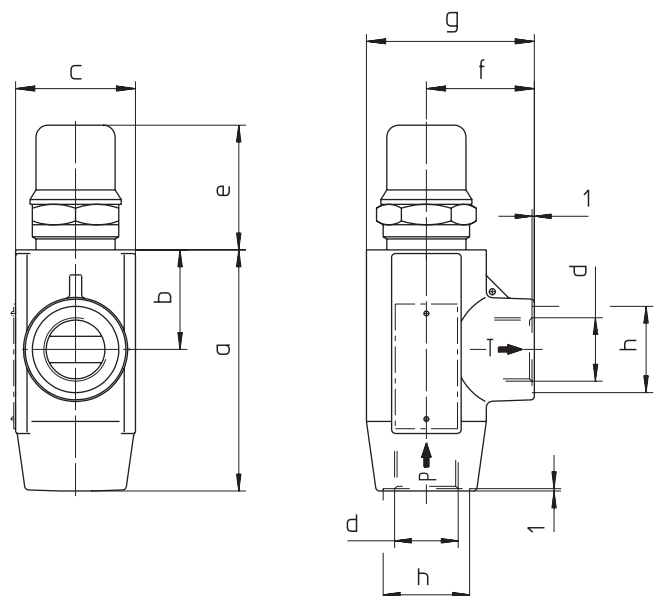
### Non-adjustable Pressure Relief Valves BBV

Non-adjustable Pressure Relief valves of the series BBV 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	BBV 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BFS2, FFS2	BBV 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TFS2, FFS3	BBV 3	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Ordering description: e.g. BBV 3 / 50

	BBV 1 + 2 mm	BBV 3 mm
a	100.5	130
b	41.5	53
c	50	65
d	G ¾	G1
e	52	81
f	45	49
g	70	81.5
h	36	42

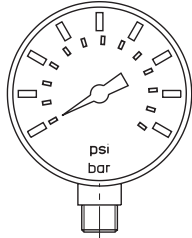


Additional relief valve characteristics upon request.  
The actual opening pressure may deviate from the nominal pressure setting of the valve because of the tension of the loaded spring rate.

Above mentioned pressure relief valves 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).

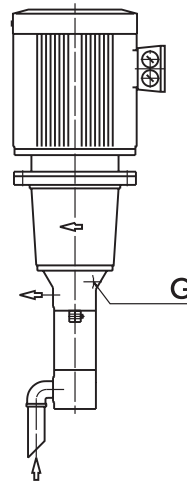
## Pressure gauge / Suction protection G4 Version

### Pressure gauge



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

### G4 Version

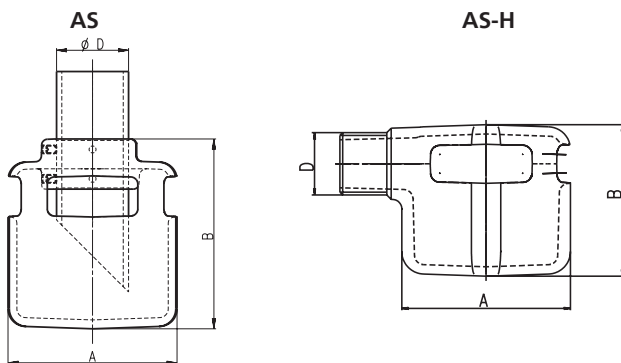


G1/8" BFS/FFS 1, 2  
G1/4" TFS/FFS 3, 4, 5

Depressurized leakage return to tank

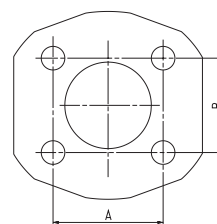
### Suction protection

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



Type	Type of Pumps	A mm	B mm	Ø 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	60	1"
AS3H	TFS3	115	115	G1½"
AS4H	TFS4	153	175	G2"
AS5H	TFS5	194	190	G2½"

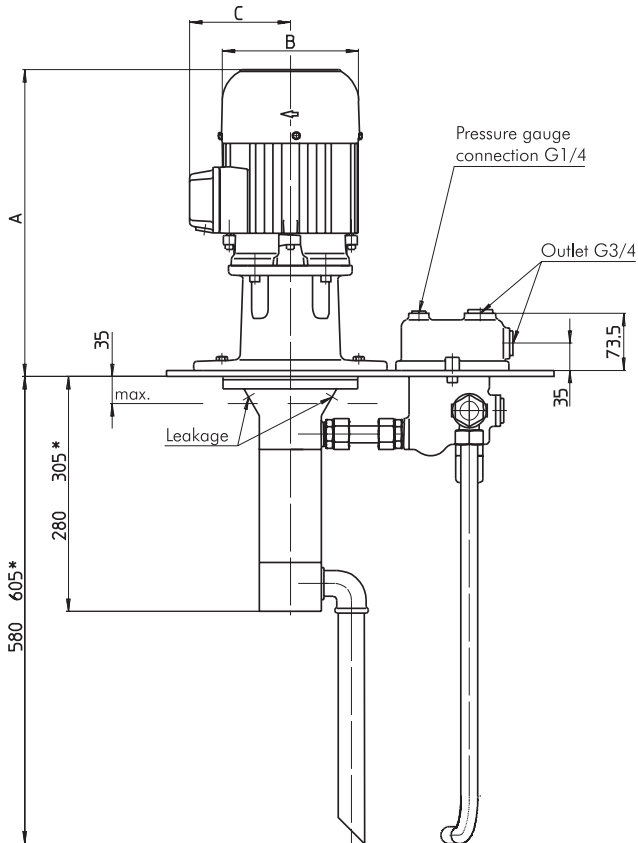
### SAE flange



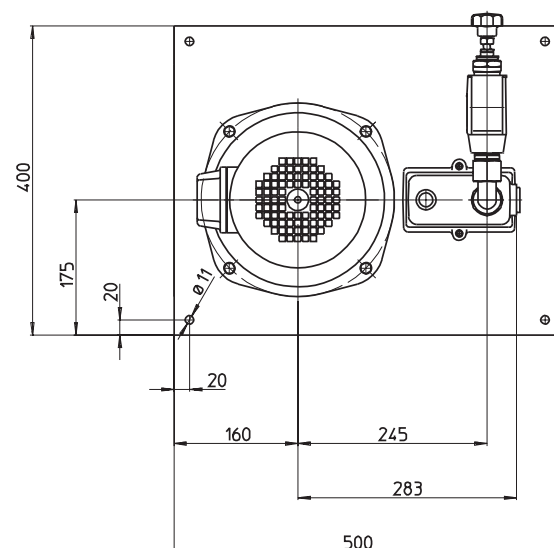
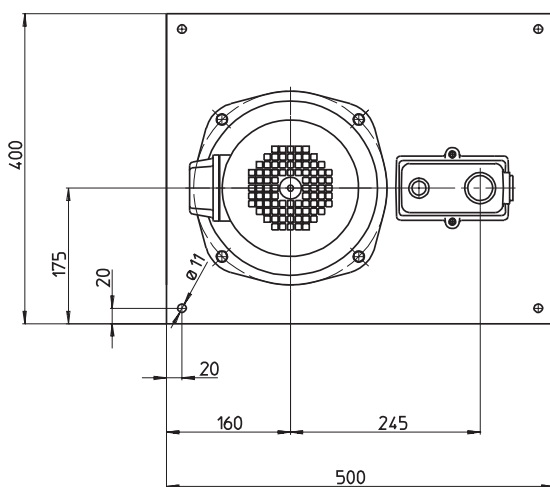
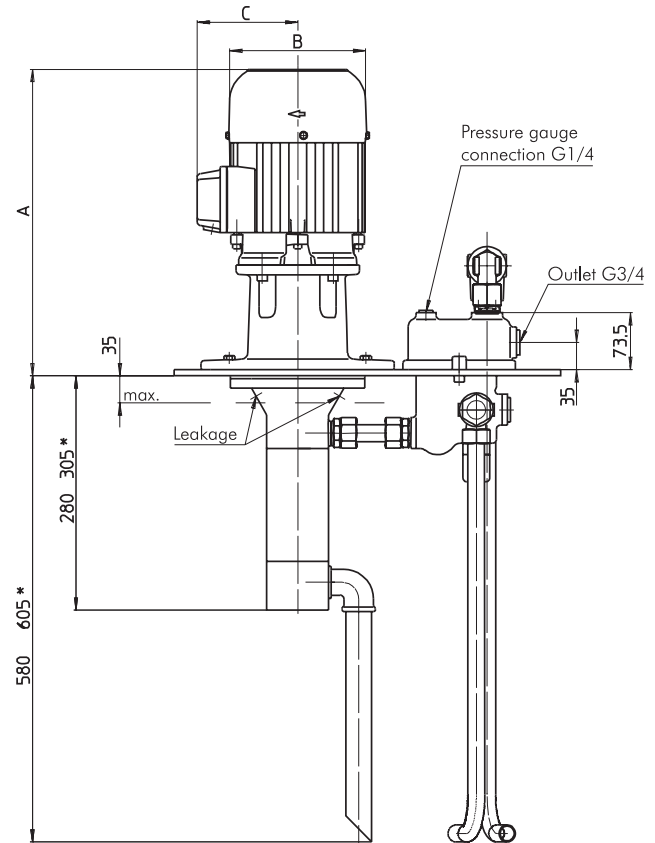
Type	Type of Pumps	A mm	B mm
SAE 2 ½	TFS5, FFS5	88.9	50.8
SAE 3	TFS6, FFS6	120.6	69.8

## 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.

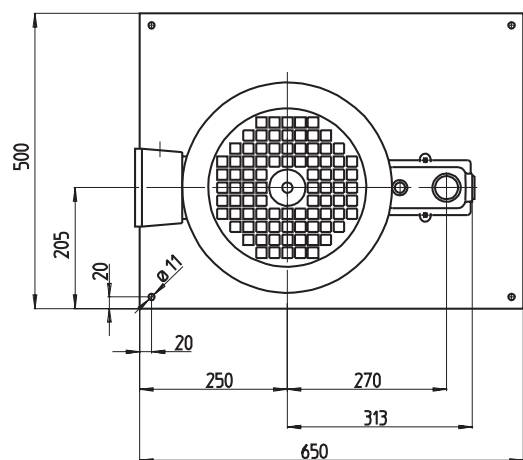
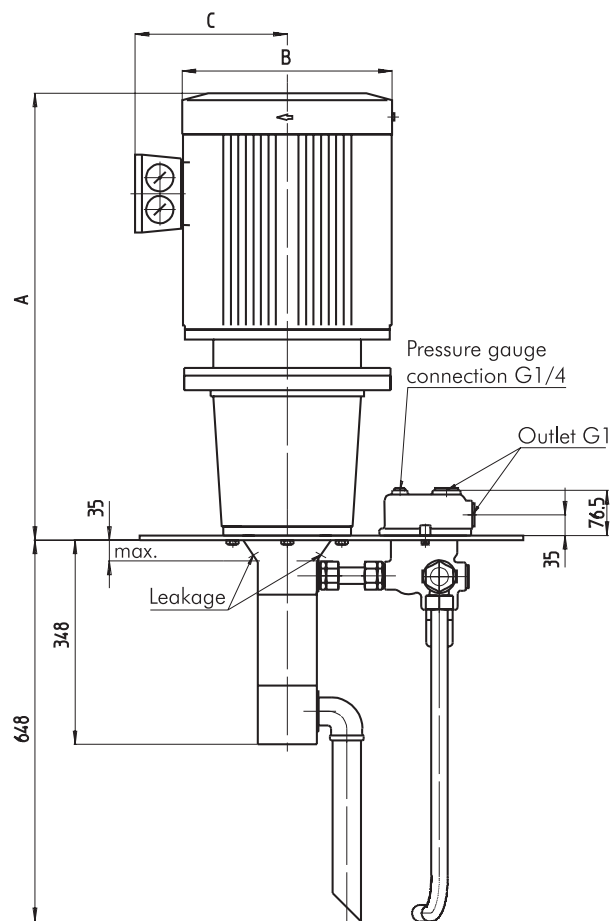


\*) Dimensions for BFS2  
Dimensions A + 8 mm mounting plate

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

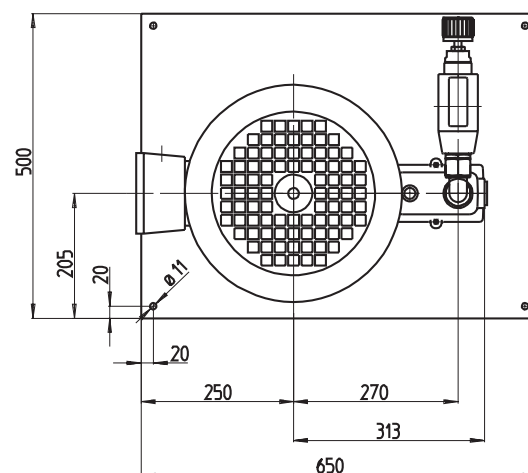
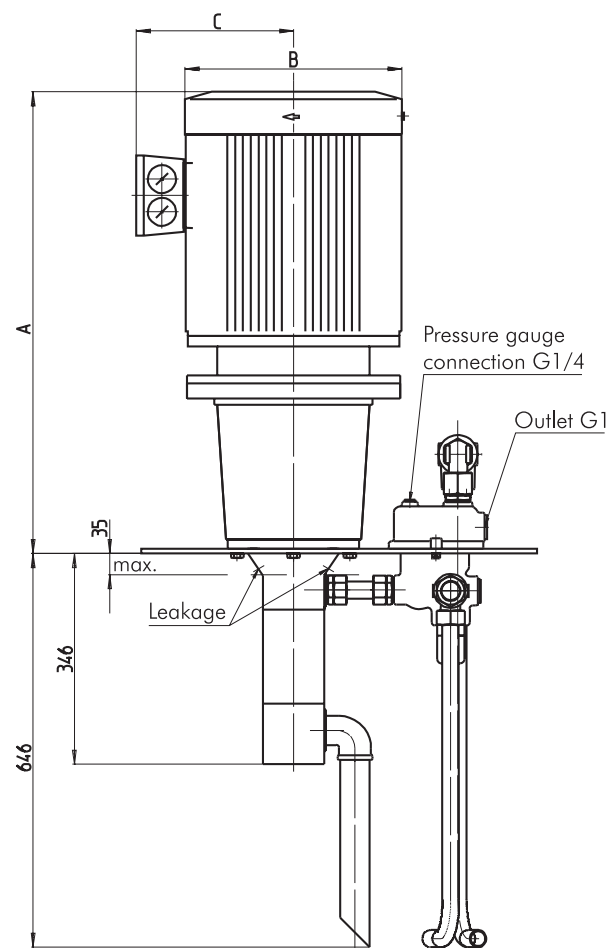
## Pump system, fully assembled

- 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

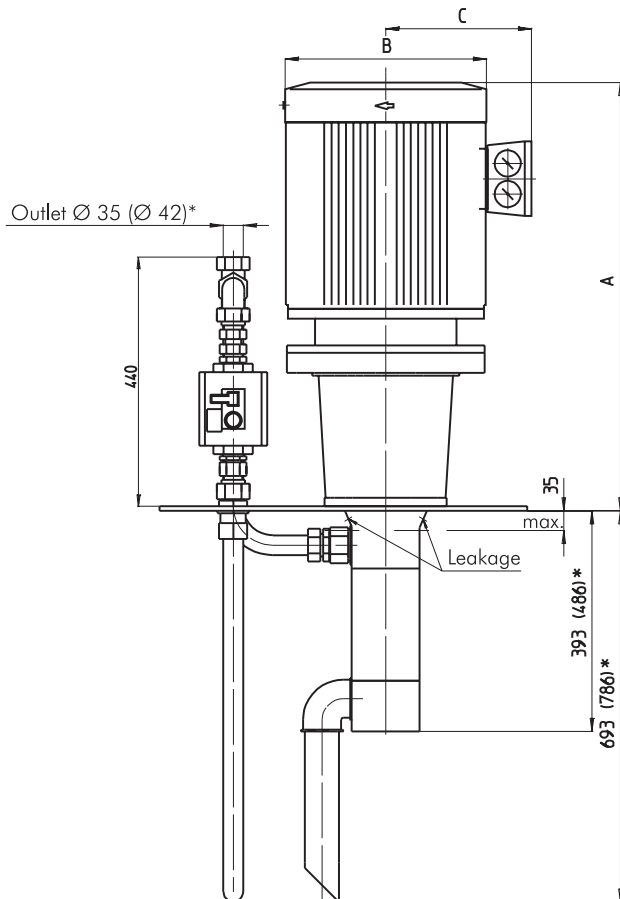
- Series TFS3, adjustable pressure relief valve:  
Screw pump with mounting plate, integrated connection block and piping fully assembled.  
The non-adjustable pressure relief valve is integrated into the connection block.  
The adjustable pressure relief valve is mounted above the plate.



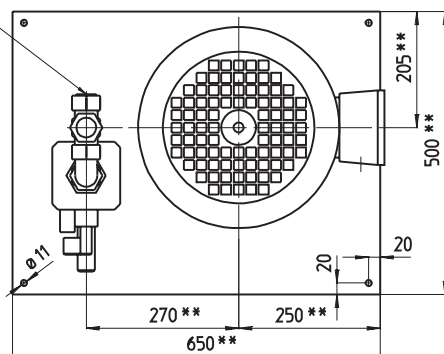
Dimensions A + 8 mm mounting plate

## Pump system, fully assembled

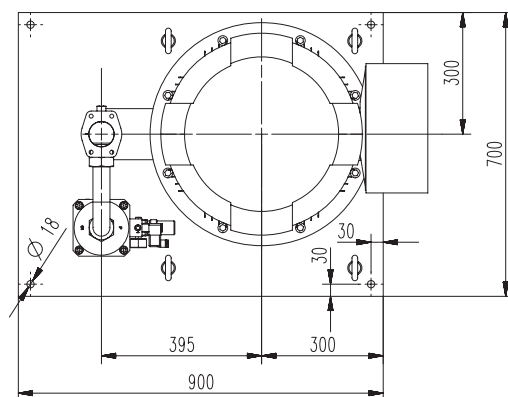
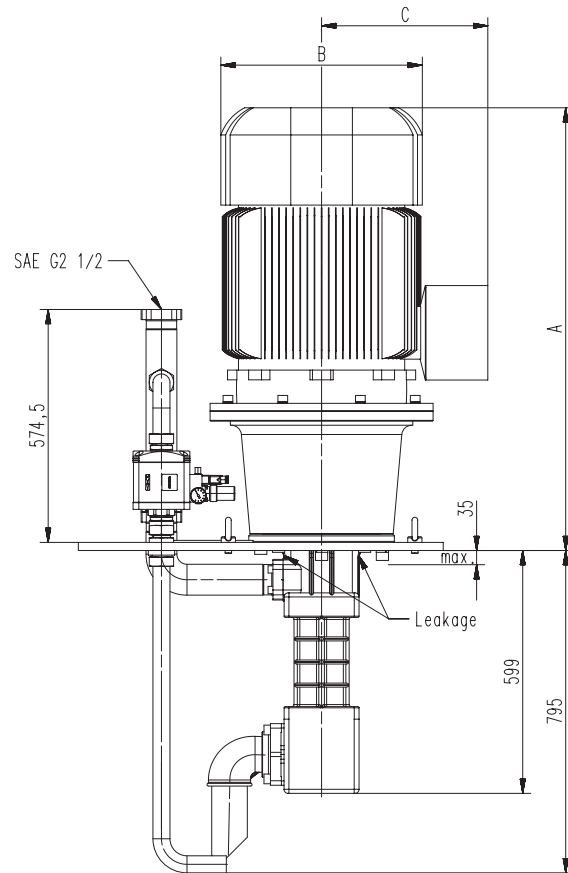
5. Series TFS4 and TFS5, adjustable pressure relief valve (pneumatically operated):  
Screw pump with mounting plate, adjustable pressure relief valve (pneumatically operated) and piping fully assembled.  
The adjustable pressure relief valve is mounted above the plate.



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



# 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 <sup>2</sup> /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"/> 1 x 115 V, 60 Hz
	<input type="checkbox"/> 3 x 200 V, 50 Hz	<input type="checkbox"/> 3 x 380 V, 60 Hz	<input type="checkbox"/> other:
	<input type="checkbox"/> 1 x 230 V, 50 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
Motor efficiency class	<input type="checkbox"/> IE2 <input type="checkbox"/> IE3

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**

**K.H. Brinkmann GmbH & Co. KG**  
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