

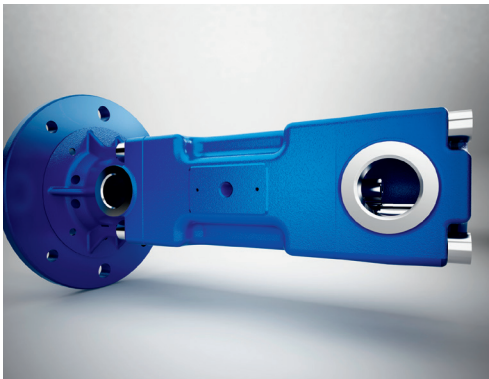


brainpower your pumps!



## SCREW SPINDLE PUMPS 2019





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## High Pressure Pumps

### Screw spindles

**60 Hz**



BFS1   FFS1, 60 Hz	<b>High pressure</b> 1.0 ... 6.5 GPM 145 ... 2175 PSI	16 – 17
BFS2   FFS2, 60 Hz	<b>High pressure</b> 3.1 ... 15.2 GPM 145 ... 2175 PSI	18 – 21
TFS3   FFS3, 60 Hz	<b>High pressure</b> 6.7 ... 31.6 GPM 145 ... 2175 PSI	22 – 23
TFS4   FFS4, 60 Hz	<b>High pressure</b> 13.2 ... 62.4 GPM 145 ... 1740 PSI	24 – 25
TFS5   FFS5, 60 Hz	<b>High pressure</b> 29.3 ... 132.1 GPM 145 ... 1740 PSI	26 – 29
TFS6   FFS6, 60 Hz	<b>High pressure</b> 56.3 ... 232 GPM 145 ... 1160 PSI	30 – 31

## High Pressure Pumps

### Screw spindles

**50 Hz**



BFS1   FFS1, 50 Hz	<b>High pressure</b> 0.7 ... 5.3 GPM 145 ... 2175 PSI	32 – 33
BFS2   FFS2, 50 Hz	<b>High pressure</b> 2.2 ... 12.5 GPM 145 ... 2175 PSI	34 – 37
TFS3   FFS3, 50 Hz	<b>High pressure</b> 5.0 ... 26.0 GPM 145 ... 2175 PSI	38 – 39
TFS4   FFS4, 50 Hz	<b>High pressure</b> 9.8 ... 51.3 GPM 145 ... 1740 PSI	40 – 41
TFS5   FFS5, 50 Hz	<b>High pressure</b> 22.7 ... 109 GPM 145 ... 1740 PSI	42 – 45
TFS6   FFS6, 50 Hz	<b>High pressure</b> 43.5 ... 191.5 GPM 145 ... 1160 PSI	46 – 47

## Electrical Features

### CE Motors acc. to EN 60034-1

Grade of protection	IP55
Type of insulation	F
Number of poles	2
Efficiencies	EN 60034-30, IE3 ≥ 1 HP (0.75 kW)

60 Hz	230 V $\Upsilon\Upsilon$ 460 V $\Upsilon$	460 V $\Upsilon$	460 V $\Delta$
up to 8.4 HP (6.3 kW)	Standard	●	●
9.2 – 20.1 HP (6.9 – 15 kW)	Standard	–	Standard
25 HP and higher (22 kW)	–	–	Standard

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

Available as a special design, e.g.:

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

● available – not available

Other voltages upon request.

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

### Motors 8 HP (6 kW) and larger

Motors wired for  $\Delta$  (Delta) connection.

The motor design allows  $\Upsilon/\Delta$ -starting, if required.

Screw-spindle pumps used for  $\Upsilon/\Delta$ -starting must be started without pressure.

Soft-starting devices can be used as an alternative to  $\Upsilon/\Delta$ -starting.

### Motor cycle time

Motors less 4 HP (3 kW) ►  
up to 200 times per hour.

Motors from 4 HP (3 kW) to 5.4 HP (4 kW) ►  
up to 40 times per hour.

Motors from 6.7 HP (5 kW) to 12.1 HP (9 kW) ►  
up to 20 times per hour.

Motors 14.7 HP (11 kW) and larger ►  
up to 15 times per hour.

Higher on/off cycling frequencies are available upon request.



## Electrical Features

### International Regulations, Brinkmann motors



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



CC311B

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

Brinkmann Motors up to 20.1 HP (15 kW), 60 Hz, and up to max. 600 V are available with UL Recognized Component Mark approval as special designs.

Brinkmann motors ranging from 2.3 kW (3.1 HP) to 13 kW (17.4 HP), 50 Hz, are available with the China Energy Label GB18613-2012, Grade 2 upon request.

Brinkmann motors ranging from 1 HP (0.86 kW) to 20.1 HP (15 kW, 60 Hz), are available with NEMA PREMIUM MG 1 upon request.

Brinkmann Motors Options	50 Hz					60 Hz								
	200 V	380 V	400 V	415 V	500 V	200 V 220 V	380 V	400V	440 V	460 V	230 V 460 V	480 V	230 V 480 V	575 V 600 V
UL/CSA	-	-	-	-	-	●	●	●	●	●	●	●	●	●
CEL (Grade 2) ≥ 2.3 kW	●	●	●	●	●	-	-	-	-	-	-	-	-	-
NEMA PREMIUM MG 1 ≥ 1 HP (≥ 0.86 kW)	Y 1 – 8.4 HP (0.86 – 6.3 kW)	-	-	-	-	●	●	●	●	●	●	●	●	●
	Δ 4.6 – 20.1 HP (3.45 – 15 kW)	-	-	-	-	-	●	●	●	●	-	●	-	●
	YY/Y 1 – 20.1 HP (0.86 – 15 kW)	-	-	-	-	-	-	○	-	-	●	-	●	-

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

### International Regulations, Standard motors

Upon request. Depending on actual motor rating and sizing (Power / Motor efficiency class) deviations in pump and motor configurations are possible. An overview of pumps built with standard motors can be found on our website.

### Current / Rated current

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

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

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

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

# Technical Information

## Electrical Features, NEMA MG1 12-12, Premium



NEMA-Premium

### Technical motor data NEMA Premium

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

#### Brinkmann motors

	Power 60 Hz		Current 2 pole 60 Hz AMPS		Noise level max. dBA / 60 Hz
	kW	HP	Y 230 V	Y 460 V	
MG1 12-12	B 1.49	B 2.0	5.4	2.7	67
	B 1.75	B 2.3	6.2	3.1	67
	B 1.95	B 2.6	7.0	3.5	67
	B 2.18	B 2.9	7.8	3.9	67
	B 2.55	B 3.4	8.8	4.4	67
	B 2.94	B 3.9	10.2	5.1	67
	B 3.45	B 4.6	12.0	6.0	67
	B 3.8	B 5.1	12.8	6.4	75
	B 4.55	B 6.1	15.8	7.9	75
	B 5.75	B 7.7	19.0	9.5	75
	B 6.3	B 8.4	20.8	10.4	77
	B 6.9	B 9.2	21.2	10.6	77
	B 7.48	B 10.0	23.0	11.5	77
	B 8.6	B 11.5	27.8	13.9	77
	B 10.3	B 13.8	31.6	15.8	78
B 12.6	B 16.9	39.2	19.6	80	
B 15.0	B 20.1	48.2	24.1	80	

#### Standard Siemens motors

	Power 60 Hz		Current 2 pole 60 Hz AMPS	Noise level dBA / 60 Hz	Current 4 pole 60 Hz AMPS	Noise level dBA / 60 Hz
	kW	HP	Y 460 V		Y 460 V	
MG1 12-12	0.75	1	1.45	67	1.59	58
	1.1	1.5	1.98	67	2.15	61
	1.5	2	2.6	72	2.85	61
	2.2	3	3.65	72	3.8	65
	3	4	4.9	74	5.1	65
	3.7	5	6.0	76	6.5	65
	5.5	7.5	8.6	76	9.3	71
			Δ 460 V		Δ 460 V	
MG1 12-12	7.5	10	11.5	75	12.4	71
	11	15	17.2	80	18.0	72
	15	20	24.0	80	25.0	72
	18.5	25	28.0	80	30.5	71
	22	30	34.0	81	36.5	73
	30	40	47.0	81	48.0	71
	37	50	57.0	82	58.0	70
	45	60	69.0	>82	71.0	70
	55	75	83.0	>82	84.0	70
	75	100	112.0	>82	116.0	82
	90	125	132.0	>82	136.0	82
110	150	160.0	>82	168.0	82	

Noise level with +3 dBA tolerance for standard motors.

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

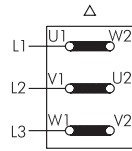
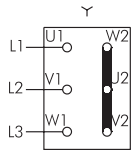
## Electrical Features

### Circuits

on request

Y (Star Connection)  
up to 8.4 HP  
(6.3 kW)

Δ (Delta Connection)  
10 HP (7.5 kW)  
and larger

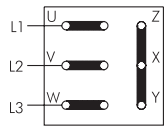


Y 440 V – 480 V  
60 Hz

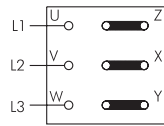
Δ 440 V – 480 V  
60 Hz

### Voltage changing 1 : 2 Y Y / Y

e. g. 208 – 230 V / 460 V, 60 Hz



YY  
Low Voltage



Y  
High Voltage

### Installation

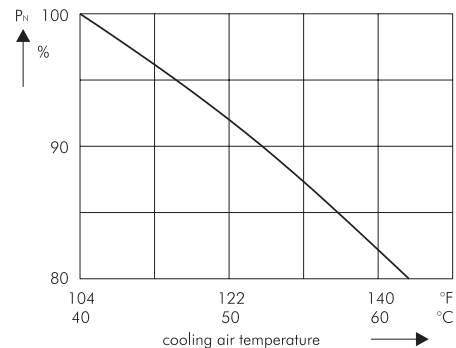
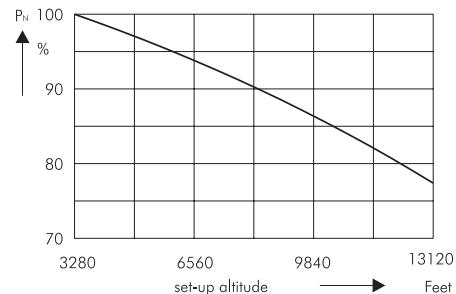
#### Brinkmann Screw Pump with connector

Motors up to 7.4 HP (5.5 kW) are available with a HAN 10-pin connector, motors 8 HP (6 kW) to 17.4 HP (13 kW) are available with HAN modular plug connector.

### Set-up altitude and coolant temperature

The specified power ratings ( $P_N$ ) and operating values for the motors apply to operating mode S 1 according to EN 60034-1 (continuous operation) at a frequency of 60 Hz, rated voltage, a cooling air temperature (KT) of max. 104 °F (40 °C) and a set-up altitude of up to 3280 ft (1000 m) above sea level. The motors can also be used at a cooling air temperature above 104 °F (40 °C) up to max. 140 °F (60 °C) or set-up altitude above 3280 ft (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 3280 ft (1000 m) above sea level.

Set-up altitude feet	Maximum cooling air temperature for heat class F °F / °C
0 up to 3280	104 / 40
3280 up to 6560	86 / 30
6560 up to 9840	66 / 19
9540 up to 13120	48 / 9



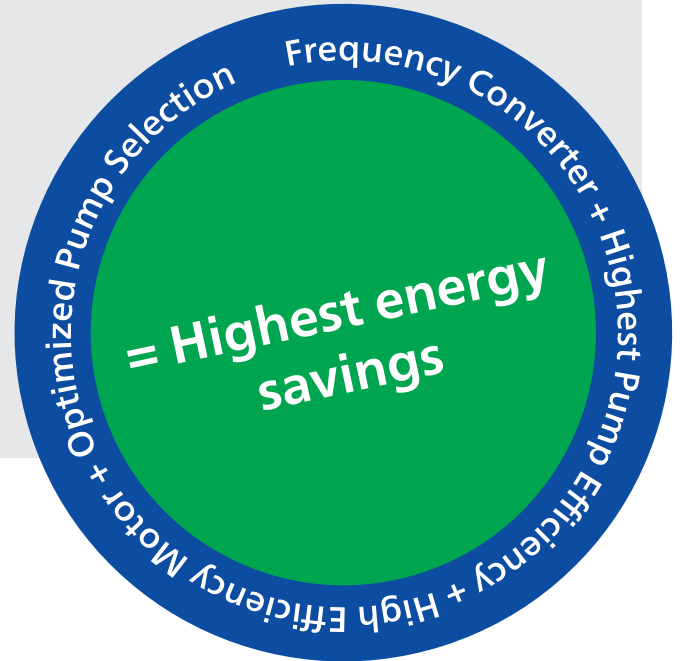
## Control / Regulation

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.

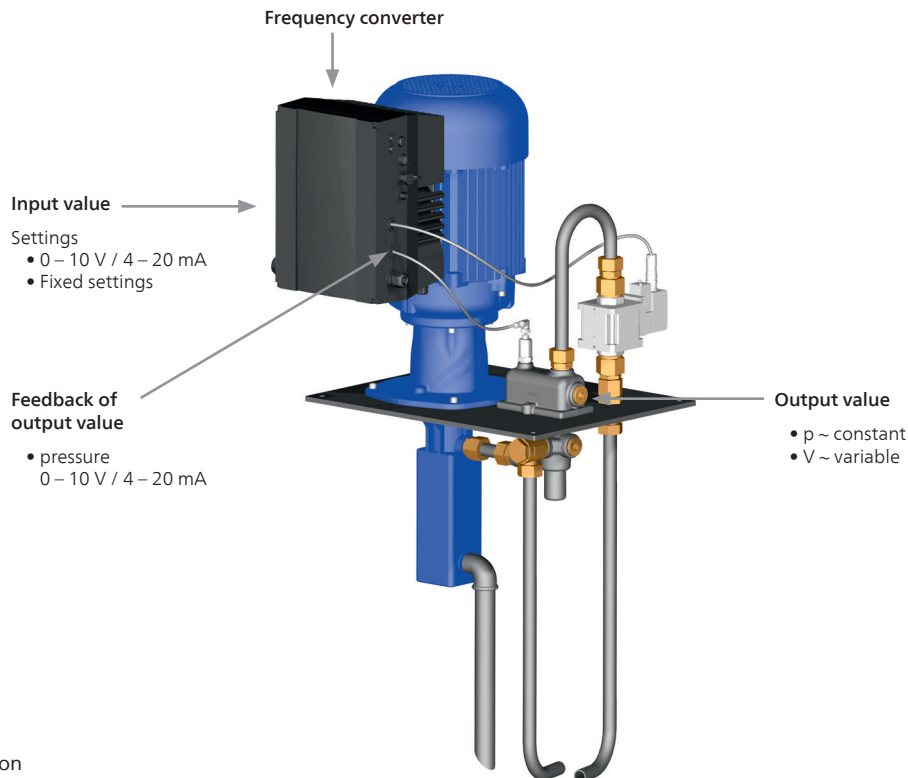


Fig. 1: Scheme of regulation

## Control / Regulation

### Variable Speed Control of High Pressure Pumps

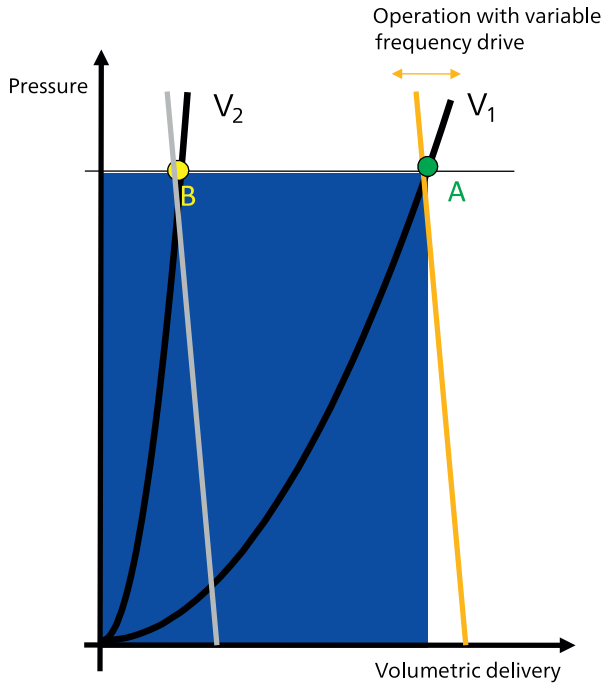


Fig. 2: Potential energy savings of a screw pump with variable frequency drive and two consumers.

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

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

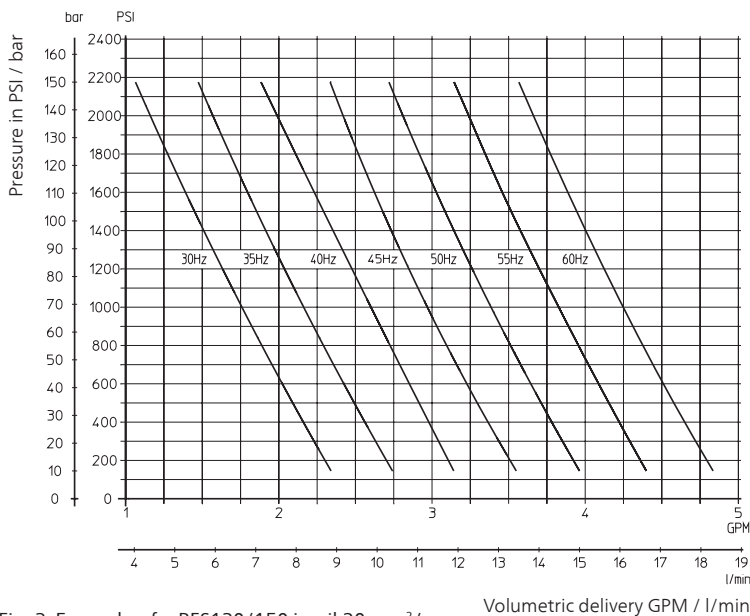


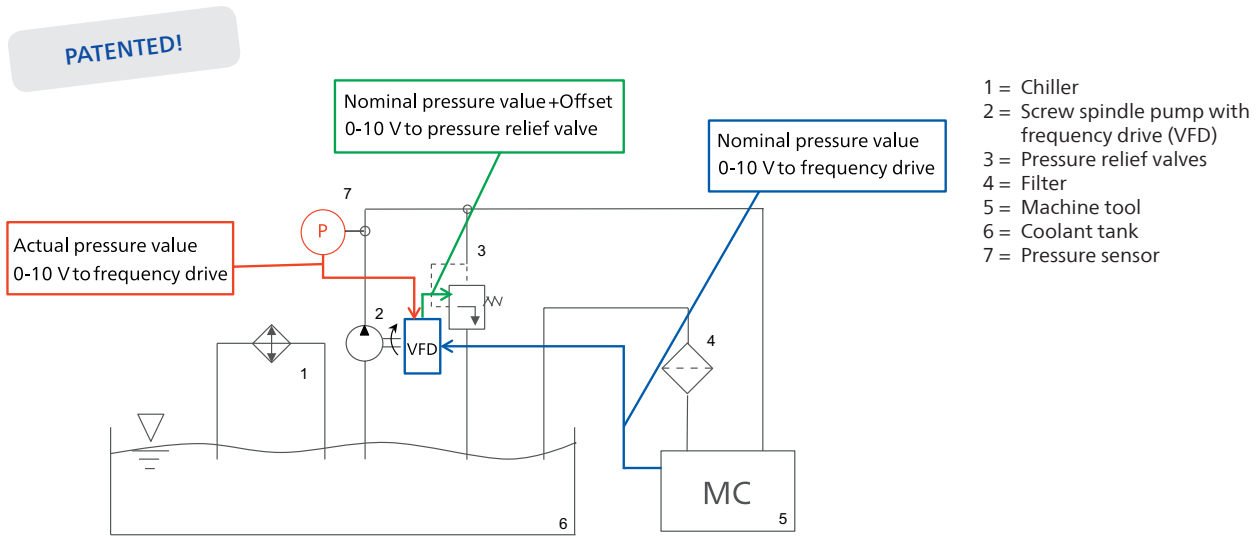
Fig. 3: Example of a BFS130/150 in oil 20 mm<sup>2</sup>/s



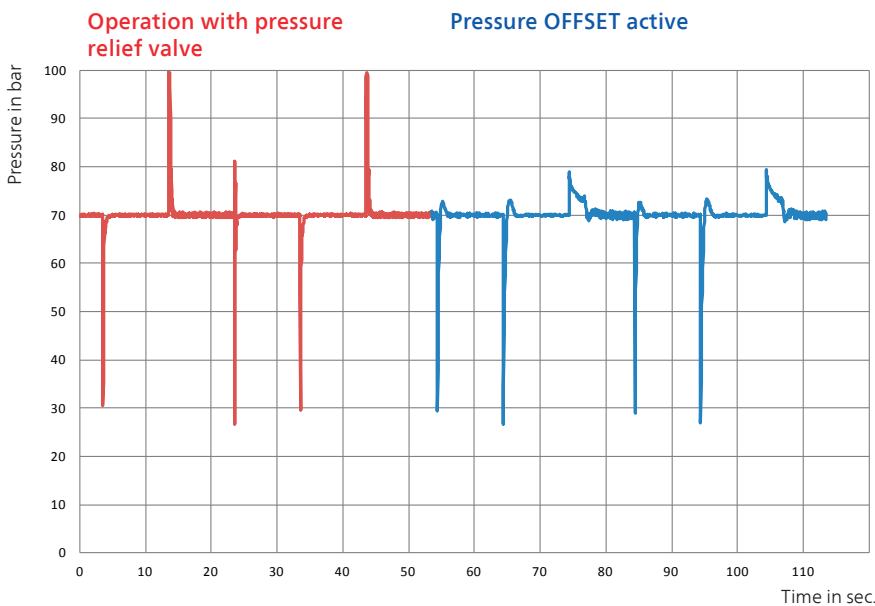
## Control / Regulation

### Brinkmann Pumps Offset Regulation for High Pressure Pumps

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



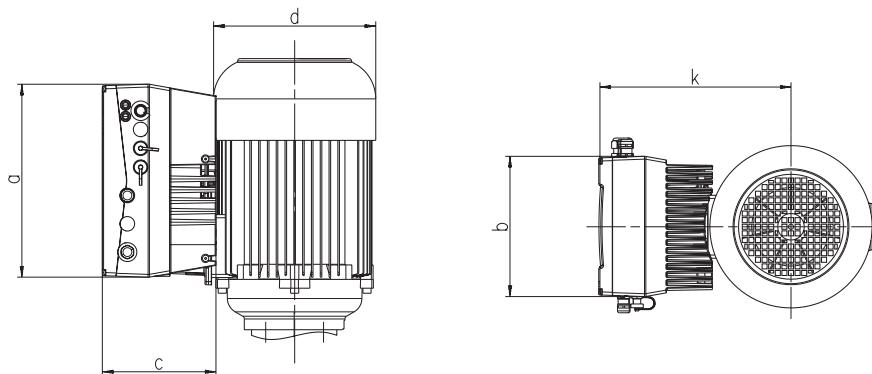
### Minimizing pressure peaks during tool change



## Control / Regulation

TECHNICAL DATA				
Frequency converter FKO (2.0 – 29.5 HP / 1.5 – 22 kW)				
Function	Specification			
Rated voltage	3 AC 380 V -10 % ... 480 V +10 %			
Rated frequency	50/60 Hz ± 6 %			
Output ranges	... 2.0 HP	3.0 – 5.4 HP	7.4 – 10 HP	15 – 29.5 HP
Housing size	A	B	C	D
Protective system	IP 65			IP 55
EMV approvals acc. to EN61800-3US	C2			
Temperature range	14 °F ... 122 °F			
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 (-Imax = 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, PROFINET			
UL approval	yes			

### Dimensions with Brinkmann motor



Motor power		housing size	a inch	b inch	c inch	d inch	k inch
kW	HP						
1.1	1.5	A	8.78	6.02	4.72	5.43	7.83
1.3 – 1.7	1.7 – 2.3	A	8.78	6.02	4.72	6.93	8.23
1.9 – 2.6	2.5 – 3.5	B	10.63	7.44	5,51	6.93	8.78
3.0 – 4.0	4.0 – 5.4	B	10.63	7.44	5,51	8.58	9.57
5.0 – 5.5	6.7 – 7.4	C	12.09	8.78	7.13	8.58	11.30
6.0 – 9.0	8.0 – 12.1	C	12.09	8.78	7.13	10.16	12.05
11.0 – 13.0	14.7 – 17.4	D	16.30	11.57	9.17	12.36	15.91

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

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

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

Brinkmann high pressure screw pumps are designed for pumping filtered and lubricating fluids such as coolant oils and water-soluble coolants. High pressure screw pumps are NOT designed for dry-running.

## Applications

Types of fluid  
oils, cooling/ cutting oils, coolants  
Kinematic viscosity  
4.6...200 SSU (1...45 mm<sup>2</sup>/s (45 cSt))  
over 200 SSU (45 mm<sup>2</sup>/s) on request  
Pumping temperature  
max. 140 °F \* (60 °C)  
\* over 140 °F (60 °C) on request  
max. Air content 3–5 vol. %  
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 14.

## 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®  
Viton® is a registered trademark of DuPont.

Standard design	Model Index	Immersion Style						Inline Style for inline installation – horizontal or vertical with mechanical seal; positive suction pressure of up to 100 PSI					
		BFS1	BFS2	TFS3	TFS4	TFS5	TFS6	FFS1	FFS2	FFS3	FFS4	FFS5	FFS6
Version													
Highly wear resistant SIC-bushing around labyrinth seal and coated driving male spindle	-KBT5	○	○	○	●	●	–	○	○	○	●	●	–
Highly wear resistant SIC-bushing around labyrinth seal, specially coated driving male spindle and outer female spindles	-KBT5N	○	○	○	○	○	●	○	○	○	○	○	●
Specially coated driving male spindle and outer female spindles	-T5N	○	○	○	–	–	–	○	○	○	–	–	–
Axial thrust compensation through radial slide bushing inside the suction cover	-A	○	○	●	●	●	●	○	○	●	●	●	●
Inline installation – vertical Mechanical seal and internal leakage return; positive suction pressure of up to 100 PSI	-G	○	○	○	○	○	●	●	●	●	●	●	●
Positive suction pressure of 100 – 300 PSI (With leakage port, please see page 51)	-G4	○	○	○	○	–	–	○	○	○	○	–	–
Viscosity > 200 SSU (> 45 mm <sup>2</sup> /s)		○	○	○	○	○	○	○	○	○	○	○	○

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

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

With an operating pressures of 1740 PSI (120 bar) and higher the pumps are supplied in special -KBT5NA execution (P, P2).

-H design	Model Index	Immersion Style up to 1740 PSI (120 bar)		
		BFS1-H	BFS2-H	TFS3-H
Version				
Highly wear resistant SIC-bushing around labyrinth seal and coated driving male spindle	-KBT5	○	○	○
Highly wear resistant SIC-bushing around labyrinth seal, specially coated driving male spindle and outer female spindles	-KBT5N	○	○	○
Specially coated driving male spindle and outer female spindles	-T5N	○	○	○
Axial thrust compensation through radial slide bushing inside the suction cover	-A	□	□	□
Inline installation – vertical Mechanical seal and internal leakage return; positive suction pressure of up to 100 PSI	-G	□	□	□
Viscosity > 200 SSU (> 45 mm <sup>2</sup> /s)		○	○	○

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

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

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

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

Screw spindle pumps with cast iron spindle housings and highly wear resistant spindles can generate pressures of up to **870 PSI (60 bar)**.

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

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

## Applications

Types of fluid  
oils, cooling/ cutting oils, coolants

Kinematic viscosity  
4.6...200 SSU (1...45 mm<sup>2</sup>/s (45 cSt))  
over 200 SSU (45 mm<sup>2</sup>/s) on request

Pumping temperature  
max. 140 °F \* (60 °C)  
\* over 140 °F (60 °C) on request

max. Air content 3–5 vol. %

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 14.

## 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®

Viton® is a registered trademark of DuPont.

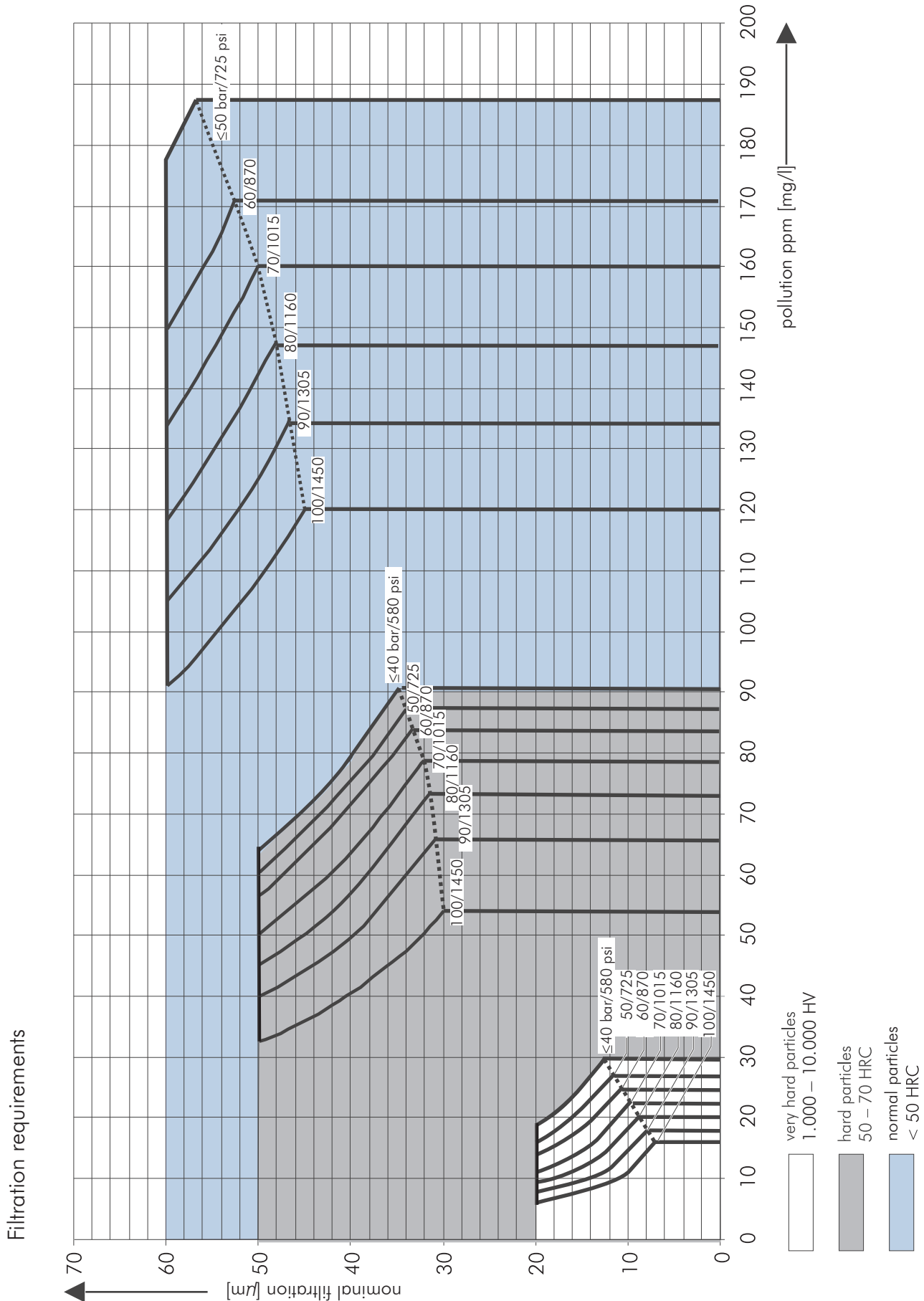
Version	Model Index	Immersion Style		Inline Style for inline installation – horizontal or vertical with mechanical seal; positive suction pressure of up to 100 PSI
		BFG2		FFG2
Inline installation – vertical Mechanical seal and internal leakage return; positive suction pressure of up to 100 PSI	-G	○		●
Viscosity > 200 SSU (> 45 mm <sup>2</sup> /s)		○		○
4-pole motor	-4	○		○

○ available at extra charge    ● Standard

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

The maximum operating pressure is 870 PSI (60 bar).

# Models and Applications for High Pressure Screw Pumps







# High Pressure Pumps

## BFS1, FFS1

### Screw spindles

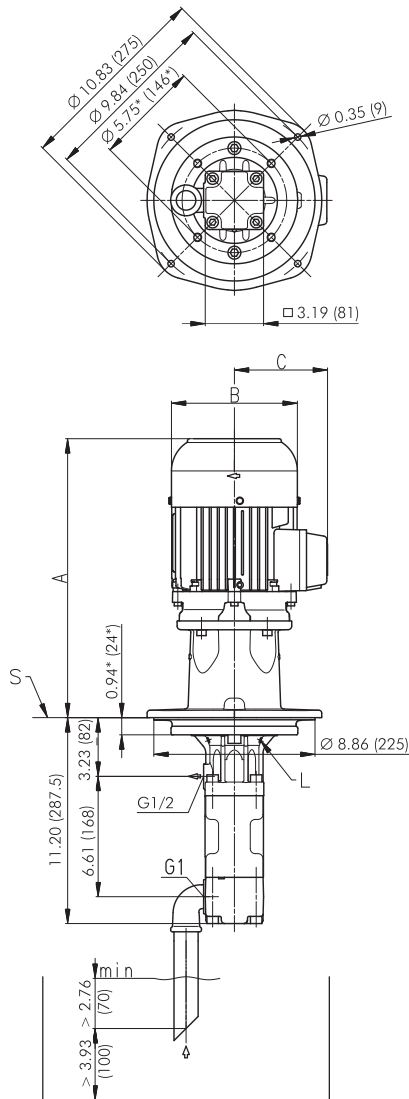


2-pole motor rotation speed 3500 RPM								4-pole motor rotation speed 1750 RPM					
Pressure max.	Flow at viscosity		Power consumption of viscosity		Motor immersion version IE3/NEMA	Motor foot mounted version NEMA	Weight	Flow at viscosity		Power consumption of viscosity		Motor NEMA	Weight
	5 SSU	90 SSU	5 SSU	90 SSU				5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>BFS130S</b>	<b>Q<sub>Th</sub><sup>1)</sup> 5.0</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 2.5</b>		-	-	-	-
10 / 145	4.6	4.8	0.8	0.8	B 2	1	86	2.1	2.3	0.4	0.4	1	66
20 / 290	4.3	4.7	1.2	1.2	B 2	1.5	86	1.8	2.2	0.5	0.5	1	66
30 / 435	4.1	4.6	1.6	1.6	B 2	2	86	1.6	2.1	0.8	0.8	1	66
40 / 580	3.8	4.5	2.0	2.0	B 2.3	3	86	1.3	2.0	0.9	1.1	1.5	71
50 / 725	3.6	4.4	2.4	2.5	B 2.9	3	97	1.1	1.9	1.2	1.3	1.5	71
60 / 870	3.4	4.3	2.8	3.0	B 3.4	4	97	0.8	1.8	1.3	1.5	2	71
70 / 1015	3.1	4.2	3.2	3.4	B 3.9	4	99	-	1.7	-	1.7	2	75
80 / 1160	2.9	4.1	3.8	3.9	B 4.6	5	126	-	1.7	-	2.0	3	75
90 / 1305	2.7	4.1	4.2	4.3	B 4.6	5	126	-	1.6	-	2.1	3	75
100 / 1450	2.5	4.0	4.6	4.7	B 5.1	5	126	-	1.5	-	2.4	3	99
110 / 1595	2.3	3.9	5.0	5.2	B 6.1	7.5	128	-	1.4	-	2.7	3	99
120 / 1740	2.1	3.8	5.4	5.6	B 6.1	7.5	128	-	1.3	-	2.8	3	99
130 / 1885	-	3.7	-	6.0	B 7.7	7.5	139	-	-	-	-	-	-
140 / 2030	-	3.6	-	6.6	B 7.7	7.5	139	-	-	-	-	-	-
150 / 2175	-	3.6	-	7.0	B 7.7	7.5	139	-	-	-	-	-	-
<b>BFS140S</b>	<b>Q<sub>Th</sub><sup>1)</sup> 6.7</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 3.3</b>		-	-	-	-
10 / 145	6.1	6.4	0.9	0.9	B 2	1.5	86	2.8	3.1	0.4	0.5	1	66
20 / 290	5.8	6.3	1.5	1.6	B 2	2	86	2.4	3.0	0.7	0.8	1	66
30 / 435	5.4	6.2	2.0	2.1	B 2.3	3	86	2.1	2.8	0.9	1.1	1.5	71
40 / 580	5.2	6.1	2.5	2.7	B 2.9	3	97	1.8	2.7	1.2	1.3	1.5	71
50 / 725	4.9	5.9	3.2	3.4	B 3.9	4	99	1.5	2.6	1.5	1.6	2	75
60 / 870	4.6	5.8	3.8	3.9	B 4.6	4	126	1.2	2.5	1.7	2.0	2	75
70 / 1015	4.3	5.7	4.3	4.4	B 5.1	5	126	1.0	2.3	2.0	2.3	3	99
80 / 1160	4.1	5.5	4.8	5.1	B 6.1	7.5	128	-	2.2	-	2.5	3	99
90 / 1305	3.9	5.4	5.4	5.6	B 6.1	7.5	128	-	2.1	-	2.8	3	99
100 / 1450	3.6	5.3	6.0	6.3	B 7.7	7.5	139	-	2.0	-	3.1	4	99
110 / 1595	3.3	5.2	6.6	6.8	B 7.7	7.5	139	-	1.8	-	3.4	4	99
120 / 1740	3.1	5.1	7.1	7.4	B 7.7	7.5	139	-	1.7	-	3.6	4	99
130 / 1885	2.8	4.9	7.6	8.0	B 8.4	10	163	-	-	-	-	-	-
140 / 2030	2.6	4.8	8.2	8.6	B 9.2	10	192	-	-	-	-	-	-
150 / 2175	2.3	4.7	8.9	9.3	B 10	10	192	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.  
Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.

# Characteristics and dimensions

## BFS1, FFS1



\*) Dimensions for 4-pole standard motor upon request

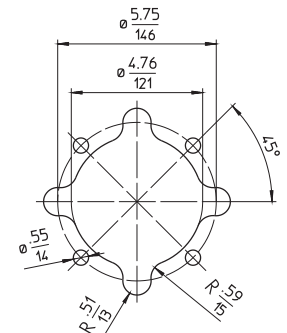
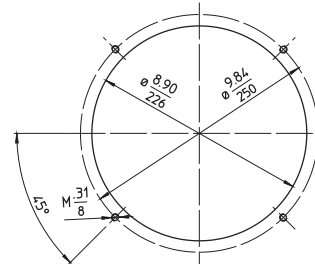
L = Leakage hole

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

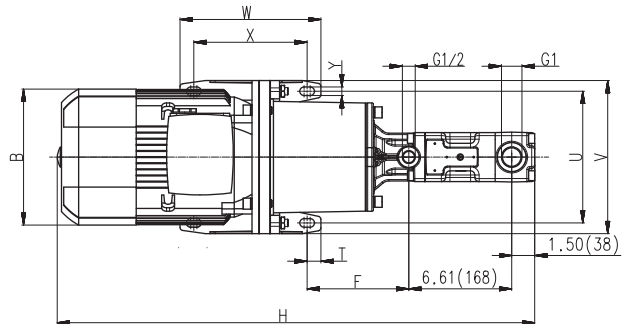
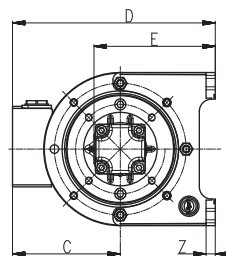
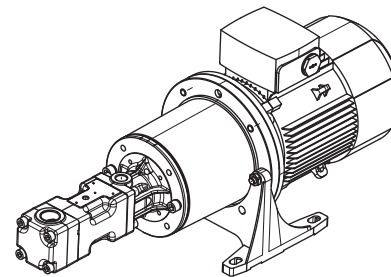
### Mounting hole patterns

BFS1 / BFS2

TFS1 / TFS2



Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



Power 2-poles HP	A Inch	B Inch	C Inch
B 2 / 2.3	16.34	6.93	5.12
B 2.9 / 3.4 / 3.9	18.66	6.93	5.12
B 4.6 / 5.1 / 6.1	20.20	8.58	5.91
B 7.7 / 8.4	21.38	8.58	5.91
B 9.2 / 10	22.99	10.16	7.60

Power 2-poles HP	Power 4-poles HP	B Inch	C Inch	D Inch	E Inch	F Inch	H Inch	T Inch	U Inch	V Inch	W Inch	X Inch	Y Inch	Z Inch
1	–	6.26	4.76	9.17	6.10	5.43	26.61	0.59	7.09	8.27	3.54	2.36	0.43	0.47
–	1	6.26	4.76	9.17	6.10	5.43	29.57	0.59	7.09	8.27	3.54	2.36	0.43	0.47
1.5	–	6.26	4.76	9.17	6.10	5.43	27.99	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2	1.5 / 2	7.01	4.96	9.37	6.10	5.43	28.39	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	–	7.01	4.96	9.37	6.10	5.43	29.96	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3 / 4	7.80	6.54	12.64	7.80	6.54	32.32	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5	–	8.74	6.97	13.07	7.80	6.54	31.69	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	–	10.31	7.95	15.24	8.98	6.73	33.74	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	–	10.31	7.95	15.24	8.98	6.73	35.71	0.89	10.43	11.81	10.63	8.86	0.55	0.71

# High Pressure Pumps

## BFS2, FFS2

### Screw spindles



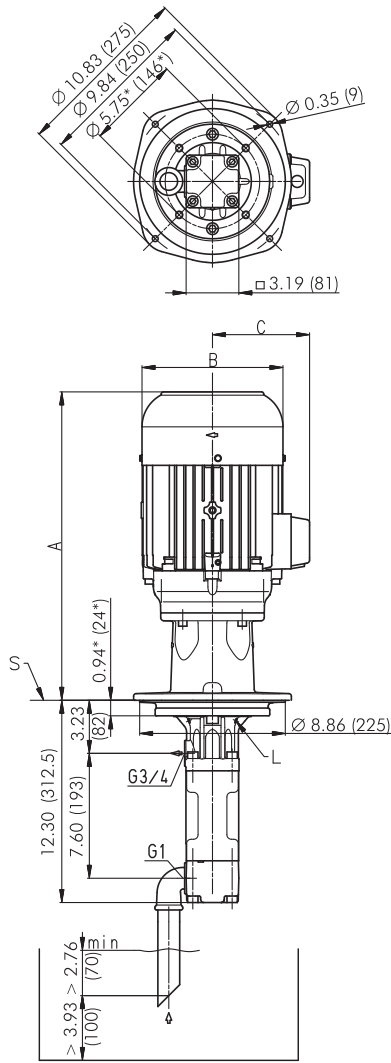
Pressure max.	Flow at viscosity		2-pole motor rotation speed 3500 RPM					4-pole motor rotation speed 1750 RPM					
			Power consumption of viscosity		Motor immersion version IE3/NEMA	Motor foot mounted version NEMA	Weight	Flow at viscosity		Power consumption of viscosity		Motor NEMA	Weight
			5 SSU	90 SSU				5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>BFS2325</b>	Q <sub>Th</sub> <sup>1)</sup> 8.3		-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 4.2		-	-	-	-
10 / 145	7.8	8.1	1.1	1.2	B 2	2	88	3.7	4.0	0.5	0.7	1	68
20 / 290	7.7	8.1	1.9	1.9	B 2.3	3	88	3.5	3.9	0.9	0.9	1.5	68
30 / 435	7.5	8.0	2.5	2.7	B 2.9	3	99	3.4	3.9	1.2	1.3	1.5	73
40 / 580	7.3	7.9	3.2	3.4	B 3.9	4	101	3.2	3.8	1.6	1.7	2	77
50 / 725	7.2	7.9	3.9	4.2	B 4.6	5	128	3.0	3.7	1.9	2.0	3	77
60 / 870	7.0	7.8	4.7	4.8	B 5.1	5	128	2.9	3.6	2.3	2.4	3	101
70 / 1015	6.9	7.7	5.4	5.6	B 6.1	7.5	130	2.7	3.6	2.7	2.8	3	101
80 / 1160	6.7	7.7	6.0	6.3	B 7.7	7.5	141	2.6	3.5	3.0	3.1	4	101
90 / 1305	6.6	7.6	6.7	7.1	B 7.7	7.5	141	2.4	3.4	3.4	3.5	4	101
100 / 1450	6.4	7.5	7.5	7.8	B 8.4	10	165	2.2	3.4	3.6	3.9	4	101
110 / 1595	6.3	7.5	8.2	8.6	B 9.2	10	192	-	3.3	-	4.3	5	101
120 / 1740	6.1	7.4	8.9	9.3	B 10	10	192	-	3.2	-	4.6	5	110
130 / 1885	6.0	7.3	9.5	10.1	B 11.5	15	207	-	3.2	-	5.0	5	110
140 / 2030	5.8	7.3	10.3	10.7	B 11.5	15	207	-	3.1	-	5.4	7.5	110
150 / 2175	5.7	7.2	11.0	11.5	B 13.8	15	220	-	3.1	-	5.6	7.5	110
<b>BFS2385</b>	Q <sub>Th</sub> <sup>1)</sup> 9.9		-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 4.9		-	-	-	-
10 / 145	9.3	9.6	1.2	1.2	B 2	2	88	4.4	4.7	0.5	0.5	1	68
20 / 290	9.1	9.6	2.1	2.1	B 2.6	3	90	4.2	4.6	1.1	1.1	1.5	73
30 / 435	8.9	9.5	3.0	3.0	B 3.4	4	99	4.0	4.5	1.5	1.5	2	73
40 / 580	8.7	9.4	3.8	3.9	B 4.6	5	128	3.8	4.5	1.9	1.9	3	77
50 / 725	8.6	9.3	4.6	4.7	B 5.1	5	128	3.6	4.4	2.3	2.4	3	101
60 / 870	8.4	9.3	5.5	5.6	B 6.1	7.5	130	3.4	4.3	2.7	2.8	3	101
70 / 1015	8.2	9.2	6.3	6.4	B 7.7	7.5	141	3.2	4.3	3.1	3.2	4	101
80 / 1160	8.0	9.1	7.1	7.4	B 7.7	10	165	3.1	4.2	3.5	3.6	4	101
90 / 1305	7.8	9.0	7.9	8.2	B 8.4	10	165	2.9	4.1	3.9	4.2	5	101
100 / 1450	7.7	9.0	8.9	9.1	B 11.5	10	207	2.7	4.0	4.3	4.6	5	110
110 / 1595	7.5	8.9	9.7	9.9	B 11.5	15	207	-	4.0	-	5.0	5	110
120 / 1740	7.3	8.8	10.5	10.9	B 11.5	15	207	-	3.9	-	5.5	7.5	110
130 / 1885	7.1	8.7	11.3	11.8	B 13.8	15	220	-	3.8	-	5.9	7.5	181
140 / 2030	6.9	8.7	12.1	12.6	B 13.8	15	220	-	3.8	-	6.3	7.5	181
150 / 2175	6.8	8.6	13.0	13.5	B 16.9	15	269	-	3.7	-	6.7	7.5	181

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.

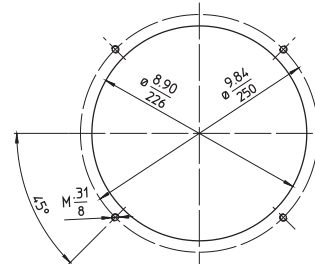
# Characteristics and dimensions

## BFS2, FFS2

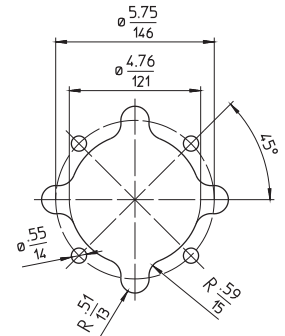


### Mounting hole patterns

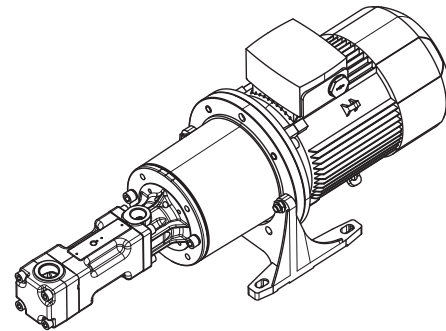
#### BFS1 / BFS2



#### TFS1 / TFS2

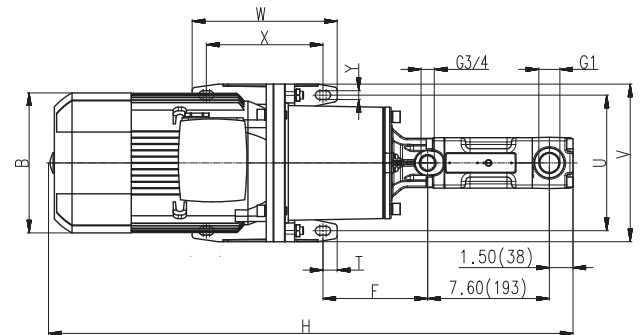
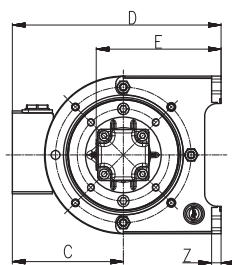


Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 HP	A	B	C
	Inch	Inch	Inch
B 2 / 2.3	16.34	6.93	5.12
B 2.6	17.36	6.93	5.12
B 2.9 / 3.4 / 3.9	18.66	6.93	5.12
B 4.6 / 5.1 / 6.1	20.20	8.58	5.91
B 7.7 / 8.4	21.38	8.58	5.91
B 9.2 / 10	22.99	10.16	7.60
B 11.5 / 13.8	24.49	10.16	7.60
B 16.9	24.80	12.20	9.45

Power 2-poles HP	Power 4-poles HP	B	C	D	E	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
-	1	6.26	4.76	9.17	6.10	5.43	30.55	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2	1.5 / 2	7.01	4.96	9.37	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	-	7.01	4.96	9.37	6.10	5.43	30.94	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3 / 4	7.80	6.54	12.64	7.80	6.54	33.31	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5	5	8.74	6.97	13.07	7.80	6.54	32.68	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	-	10.31	7.95	15.24	8.98	6.73	34.72	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	7.5	10.31	7.95	15.24	8.98	6.73	36.69	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15	-	12.36	9.33	18.58	10.94	8.27	41.38	0.79	11.81	13.78	12.01	10.43	0.71	0.71



# High Pressure Pumps

## BFS2, FFS2

### Screw spindles



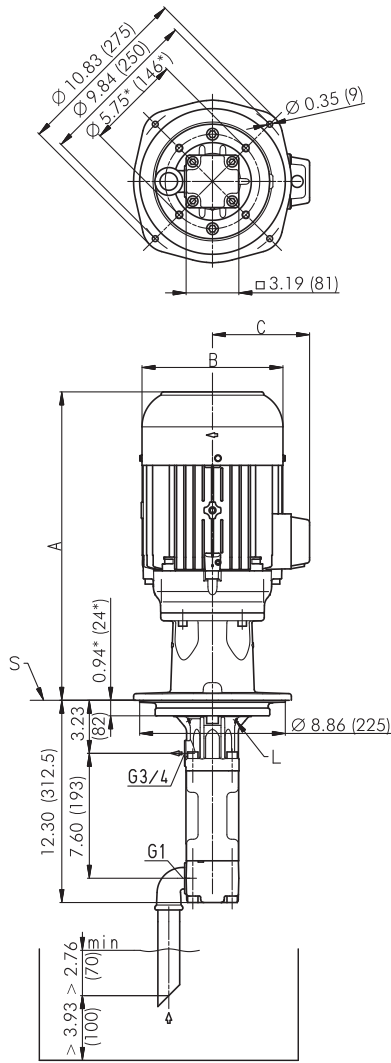
Pressure max.	Flow at viscosity		2-pole motor rotation speed 3500 RPM					4-pole motor rotation speed 1750 RPM					
			Power consumption of viscosity		Motor immersion version IE3/NEMA	Motor foot mounted version NEMA	Weight Lbs	Flow at viscosity		Power consumption of viscosity		Motor NEMA	Weight Lbs
			5 SSU	90 SSU				5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>BFS250S</b>	<b>Q<sub>Th</sub><sup>1)</sup> 13.0</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 6.5</b>	-	-	-	-	-
10 / 145	12.3	12.7	1.5	1.6	B 2.3	3	88	5.8	6.2	0.7	0.8	1	68
20 / 290	12.0	12.6	2.7	2.7	B 3.4	4	99	5.5	6.1	1.3	1.3	2	73
30 / 435	11.8	12.5	3.8	3.9	B 4.6	5	128	5.3	6.0	1.9	1.9	3	77
40 / 580	11.5	12.4	4.8	5.1	B 6.1	7.5	130	5.0	5.9	2.4	2.5	3	101
50 / 725	11.3	12.3	5.9	6.2	B 7.7	7.5	141	4.8	5.8	3.0	3.1	4	101
60 / 870	11.1	12.2	7.0	7.4	B 7.7	10	165	4.6	5.7	3.5	3.6	4	101
70 / 1015	10.9	12.1	8.2	8.4	B 11.5	10	207	4.4	5.6	4.0	4.3	5	101
80 / 1160	10.6	12.0	9.3	9.7	B 11.5	15	207	4.1	5.5	4.6	4.8	5	110
90 / 1305	10.5	11.9	10.3	10.9	B 11.5	15	207	3.9	5.4	5.1	5.4	7.5	110
100 / 1450	10.3	11.8	11.4	11.9	B 13.8	15	220	3.7	5.3	5.6	6.0	7.5	181
110 / 1595	9.9	11.7	12.5	13.1	B 13.8	15	220	-	5.2	-	6.6	7.5	181
120 / 1740	9.6	11.6	13.7	14.1	B 16.9	15	269	-	5.1	-	7.1	7.5	181
130 / 1885	9.3	11.5	14.8	15.4	B 16.9	20	269	-	5.0	-	7.8	10	181
140 / 2030	8.9	11.4	15.8	16.5	B 20.1	20	269	-	4.9	-	8.3	10	181
150 / 2175	8.6	11.3	16.9	17.7	B 20.1	20	269	-	4.8	-	8.9	10	181
<b>BFS260S</b>	<b>Q<sub>Th</sub><sup>1)</sup> 15.6</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 7.8</b>	-	-	-	-	-
10 / 145	14.7	15.2	1.7	2.0	B 2.9	3	99	6.9	7.4	0.8	0.9	1.5	73
20 / 290	14.4	15.1	3.1	3.4	B 4.6	4	128	6.6	7.3	1.5	1.7	2	73
30 / 435	14.1	14.9	4.4	4.8	B 6.1	7.5	130	6.3	7.1	2.1	2.4	3	101
40 / 580	13.8	14.7	5.8	6.2	B 7.7	7.5	141	6.0	6.9	2.8	3.1	4	101
50 / 725	13.5	14.6	7.0	7.6	B 8.4	10	165	5.7	6.8	3.5	3.9	4	101
60 / 870	13.2	14.4	8.3	9.0	B 11.5	10	207	5.4	6.6	4.2	4.6	5	110
70 / 1015	12.8	14.3	9.7	10.5	B 11.5	15	207	5.0	6.5	4.8	5.2	7.5	110
80 / 1160	12.5	14.1	11.0	11.8	B 13.8	15	220	4.8	6.3	5.5	5.9	7.5	181
90 / 1305	12.2	13.9	12.3	13.3	B 16.9	15	269	4.4	6.1	6.2	6.7	7.5	181
100 / 1450	11.9	13.8	13.7	14.8	B 16.9	20	269	4.1	6.0	6.8	7.4	7.5	181
110 / 1595	11.5	13.6	15.0	16.2	B 16.9	20	269	-	5.8	-	8.0	10	181
120 / 1740	11.1	13.4	16.2	17.6	B 20.1	20	269	-	5.6	-	8.9	10	181
130 / 1885	10.6	13.1	17.6	19.0	B 20.1	20	269	-	-	-	-	-	-
140 / 2030	10.2	12.8	18.9	20.4	-	25	247	-	-	-	-	-	-
150 / 2175	9.8	12.4	20.2	21.9	-	25	247	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.

# Characteristics and dimensions

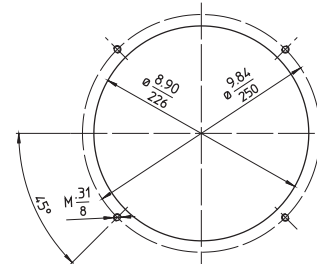
## BFS2, FFS2



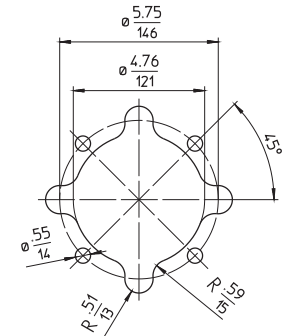
\*) Dimensions for 4-pole standard motor upon request  
 L = Leakage hole  
 S = Mounting plate, please refer to the cut-out of mounting hole

### Mounting hole patterns

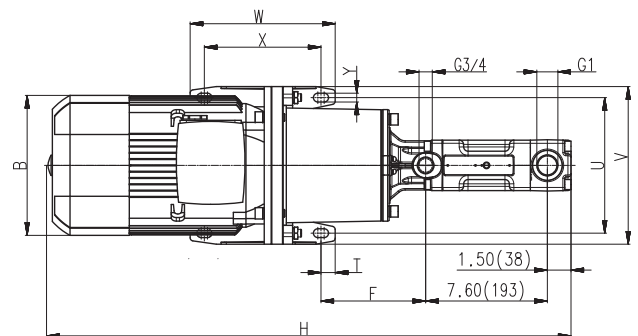
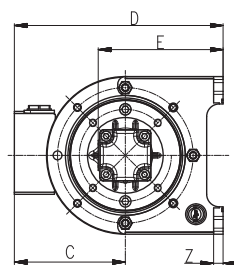
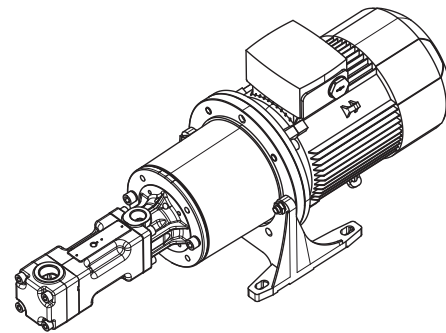
#### BFS1 / BFS2



#### TFS1 / TFS2



Dimensions in Inches / mm  
 All corners must be deburred!  
 According to ISO 2768-m



Power 2-poles HP	A Inch	B Inch	C Inch
B 2.3	16.34	6.93	5.12
B 2.9 / 3.4	18.66	6.93	5.12
B 4.6 / 6.1	20.20	8.58	5.91
B 7.7 / 8.4	21.38	8.58	5.91
B 11.5 / 13.8	24.49	10.16	7.60
B 16.9 / 20.1	24.80	12.20	9.45

Power 2-poles HP	Power 4-poles HP	B Inch	C Inch	D Inch	E Inch	F Inch	H Inch	T Inch	U Inch	V Inch	W Inch	X Inch	Y Inch	Z Inch
-	1	6.26	4.76	9.17	6.10	5.43	30.55	0.59	7.09	8.27	3.54	2.36	0.43	0.47
-	1.5 / 2	7.01	4.96	9.37	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	-	7.01	4.96	9.37	6.10	5.43	30.94	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3 / 4	7.80	6.54	12.64	7.80	6.54	33.31	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5	5	8.74	6.97	13.07	7.80	6.54	32.68	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	-	10.31	7.95	15.24	8.98	6.73	34.72	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	7.5	10.31	7.95	15.24	8.98	6.73	36.69	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	10	10.31	7.95	15.24	8.98	6.73	37.01	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	-	12.36	9.33	18.58	10.94	8.27	41.38	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	-	12.36	9.33	18.58	10.94	8.27	43.74	0.79	11.81	13.78	12.01	10.43	0.71	0.71

# High Pressure Pumps

## TFS3, FFS3

### Screw spindles



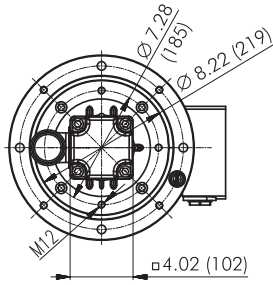
2-pole motor rotation speed 3500 RPM							4-pole motor rotation speed 1750 RPM					
Pressure max.	Flow at viscosity		Power consumption of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU	NEMA		5 SSU	90 SSU	5 SSU	90 SSU	NEMA	
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS348/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 20.4</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 10.2</b>		-	-	-	-
10 / 145	19.4	20.0	2.4	2.5	4	121	9.1	9.7	1.1	1.1	1.5	97
20 / 290	19.0	19.7	4.2	4.4	5	137	8.7	9.5	2.0	2.0	3	104
30 / 435	18.6	19.5	5.9	6.2	7.5	159	8.4	9.3	2.8	3.0	4	128
40 / 580	18.2	19.3	7.6	8.0	10	190	8.0	9.1	3.8	3.9	5	128
50 / 725	17.9	19.2	9.3	9.8	15	232	7.6	8.9	4.6	4.8	7.5	137
60 / 870	17.5	19.0	11.0	11.5	15	232	7.3	8.7	5.5	5.8	7.5	205
70 / 1015	17.2	18.8	12.7	13.4	15	232	7.0	8.6	6.3	6.7	7.5	205
80 / 1160	16.9	18.6	14.5	15.2	20	251	6.7	8.4	7.2	7.6	10	205
90 / 1305	16.6	18.5	16.2	17.0	20	251	6.3	8.3	8.0	8.6	10	205
100 / 1450	16.4	18.3	18.0	18.8	20	251	6.0	8.1	9.0	9.5	10	205
110 / 1595	15.9	18.2	19.7	20.5	25	273	-	8.0	-	10.5	15	205
120 / 1740	15.4	18.1	21.3	22.4	25	273	-	7.9	-	11.4	15	249
130 / 1885	15.0	18.0	23.1	24.1	25	273	-	7.7	-	12.3	15	249
140 / 2030	14.5	17.9	24.8	25.9	30	351	-	7.6	-	13.3	15	351
150 / 2175	14.1	17.8	26.6	27.8	30	351	-	7.6	-	14.2	15	249
<b>TFS364/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 27.3</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 13.6</b>		-	-	-	-
10 / 145	25.8	26.6	3.0	3.2	7.5	159	12.1	13.0	1.5	1.5	2	104
20 / 290	25.3	26.3	5.2	5.6	7.5	159	11.7	12.7	2.5	2.7	3	128
30 / 435	24.8	26.1	7.6	8.0	10	190	11.2	12.4	3.8	3.9	5	128
40 / 580	24.4	25.8	9.9	10.3	15	232	10.8	12.2	4.8	5.1	7.5	137
50 / 725	24.0	25.6	12.2	12.7	15	232	10.3	12.0	6.0	6.3	7.5	205
60 / 870	23.5	25.4	14.5	15.2	20	251	9.9	11.8	7.2	7.5	10	205
70 / 1015	23.1	25.2	16.8	17.6	20	251	9.5	11.5	8.3	8.7	10	205
80 / 1160	22.7	25.0	19.2	20.0	25	273	9.1	11.3	9.5	9.9	15	205
90 / 1305	22.4	24.8	21.5	22.4	25	273	8.7	11.1	10.6	11.1	15	205
100 / 1450	22.0	24.6	23.7	24.7	30	351	8.2	11.0	11.8	12.3	15	249
110 / 1595	21.4	24.4	26.0	27.1	30	351	-	10.8	-	13.5	15	249
120 / 1740	20.8	24.3	28.4	29.5	30	351	-	10.6	-	14.8	15	249
130 / 1885	20.2	23.9	30.7	31.9	40	454	-	-	-	-	-	-
140 / 2030	19.6	23.5	33.0	34.3	40	454	-	-	-	-	-	-
150 / 2175	19.1	23.1	35.3	36.6	40	454	-	-	-	-	-	-
<b>TFS376/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 32.4</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 16.2</b>		-	-	-	-
10 / 145	30.7	31.6	3.4	3.8	10	190	14.5	15.4	1.6	1.7	3	104
20 / 290	30.1	31.3	6.2	6.6	10	190	13.9	15.1	3.0	3.2	4	128
30 / 435	29.6	31.0	8.9	9.5	15	232	13.4	14.8	4.4	4.7	7.5	137
40 / 580	29.1	30.7	11.7	12.3	15	232	12.9	14.5	5.8	6.2	7.5	205
50 / 725	28.5	30.4	14.3	15.2	20	251	12.3	14.2	7.1	7.6	10	205
60 / 870	28.0	30.1	17.2	18.1	20	251	11.8	14.0	8.4	9.0	10	205
70 / 1015	27.5	29.9	19.8	20.9	25	273	11.3	13.7	9.8	10.5	15	205
80 / 1160	27.0	29.7	22.5	23.9	30	351	10.8	13.5	11.3	11.9	15	249
90 / 1305	26.5	29.4	25.3	26.7	30	351	10.3	13.3	12.6	13.4	15	249
100 / 1450	26.0	29.2	28.0	29.5	40	454	9.8	13.1	13.9	14.9	20	249
110 / 1595	25.2	29.0	30.8	32.5	40	454	-	12.8	-	16.4	20	287
120 / 1740	24.5	28.9	33.5	35.3	40	454	-	12.7	-	17.8	20	287
130 / 1885	23.7	28.4	36.3	38.2	40	454	-	-	-	-	-	-
140 / 2030	23.0	27.9	39.0	41.0	50	501	-	-	-	-	-	-
150 / 2175	22.2	27.5	41.7	43.9	50	501	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.

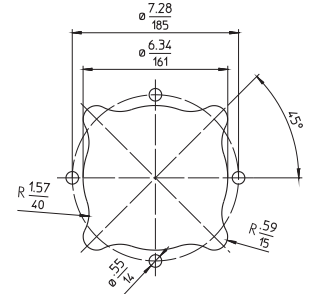
# Characteristics and dimensions

## TFS3, FFS3

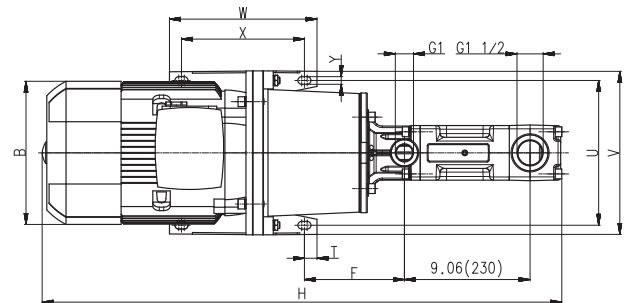
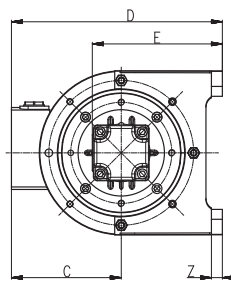
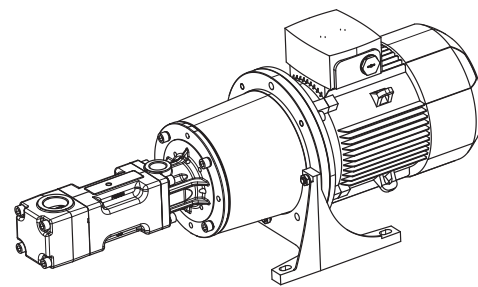
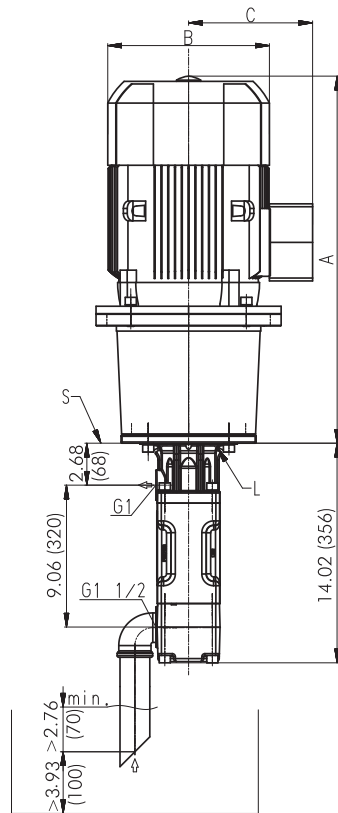


### Mounting hole patterns

TFS3 / TFS4



Dimensions in Inches / mm  
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 HP	Power 4-poles HP	A Inch	B Inch	C Inch	D Inch	E Inch	F Inch	H Inch	T Inch	U Inch	V Inch	W Inch	X Inch	Y Inch	Z Inch
–	1.5 / 2	18.74	7.01	4.96	9.37	6.50	6.57	33.35	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3 / 4	22.36	7.80	6.54	12.64	8.19	7.32	36.38	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5	5	21.69	8.74	6.97	13.07	8.19	7.32	35.71	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	–	23.43	10.31	7.95	15.24	9.37	7.20	37.44	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	7.5	25.39	10.31	7.95	15.24	9.37	7.20	39.41	0.89	10.43	11.81	10.63	8.86	0.55	0.71
–	10	25.75	10.31	7.95	15.24	9.37	7.20	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.08	12.36	9.33	18.58	11.34	8.74	44.09	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	20	32.44	12.36	9.33	18.58	11.34	8.74	46.46	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	–	32.44	14.02	11.26	20.51	11.34	8.74	46.46	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	–	34.68	15.59	12.40	22.64	12.32	8.35	48.70	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	–	35.67	15.59	12.40	22.64	12.32	8.35	49.68	0.98	13.78	15.75	13.78	11.81	0.71	0.79

# High Pressure Pumps

## TFS4, FFS4

### Screw spindles



2-pole motor rotation speed 3500 RPM							4-pole motor rotation speed 1750 RPM					
Pressure max.	Flow at viscosity		Power consumption of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU	NEMA		5 SSU	90 SSU	5 SSU	90 SSU	NEMA	
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS460/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 39.9</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 20.0</b>		-	-	-	-
10 / 145	38.0	38.8	4.4	5.0	7.5	183	18.0	19.0	2.1	2.1	3	150
20 / 290	37.3	38.6	7.8	8.6	10	212	17.2	18.5	3.8	3.9	5	150
30 / 435	36.5	38.0	11.3	12.1	15	254	16.6	18.2	5.5	5.8	7.5	159
40 / 580	35.9	37.8	14.6	15.7	20	273	15.9	17.7	7.1	7.5	10	227
50 / 725	35.1	37.5	18.0	19.3	25	295	15.1	17.4	8.9	9.4	10	227
60 / 870	34.6	37.0	21.3	22.8	25	295	14.5	17.2	10.6	11.3	15	227
70 / 1015	33.8	36.7	24.7	26.4	30	373	14.0	16.6	12.2	13.0	15	271
80 / 1160	33.3	36.5	28.2	29.9	40	476	13.2	16.4	13.9	14.9	20	271
90 / 1305	32.8	36.2	31.5	33.5	40	476	12.7	16.1	15.6	16.6	20	309
100 / 1450	32.2	35.9	34.9	37.1	40	476	11.9	15.9	17.3	18.5	20	309
110 / 1595	31.7	35.7	38.2	40.6	50	523	-	15.6	-	20.4	25	309
120 / 1740	30.9	35.4	41.7	44.3	50	523	-	15.3	-	22.1	25	309
<b>TFS480/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 53.3</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 26.6</b>		-	-	-	-
10 / 145	50.7	52.0	5.6	6.6	10	212	24.0	25.4	2.7	2.8	4	150
20 / 290	49.7	51.3	10.1	11.4	15	254	23.0	24.8	5.0	5.2	7.5	159
30 / 435	48.6	50.7	14.6	16.2	20	273	22.2	24.0	7.1	7.6	10	227
40 / 580	47.8	50.2	19.0	20.9	25	295	21.1	23.5	9.4	10.1	15	227
50 / 725	47.0	49.7	23.6	25.7	30	373	20.3	23.2	11.7	12.5	15	271
60 / 870	46.2	49.4	28.2	30.6	40	476	19.6	22.7	13.9	14.9	20	271
70 / 1015	45.4	48.9	32.6	35.4	40	476	18.8	22.2	16.2	17.3	20	309
80 / 1160	44.6	48.3	37.1	40.2	50	523	18.0	21.9	18.4	19.7	20	309
90 / 1305	43.9	48.1	41.7	45.1	50	523	17.2	21.4	20.7	22.1	25	309
100 / 1450	43.3	47.8	46.1	49.8	60	789	16.4	21.1	22.9	24.5	25	384
110 / 1595	42.5	47.6	50.7	54.6	60	789	-	20.9	-	27.0	30	384
120 / 1740	41.7	47.3	55.1	59.4	60	789	-	20.6	-	29.4	30	401
<b>TFS496/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 63.9</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 32.0</b>		-	-	-	-
10 / 145	61.0	62.1	6.4	7.5	10	212	29.1	30.1	3.1	3.6	5	150
20 / 290	59.7	61.6	11.9	13.3	15	254	27.7	29.6	5.8	6.4	7.5	227
30 / 435	58.7	61.0	17.3	19.0	25	295	26.7	29.1	8.4	9.4	10	227
40 / 580	57.6	60.5	22.7	24.8	30	373	25.6	28.5	11.3	12.2	15	271
50 / 725	56.5	60.0	28.2	30.6	40	476	24.6	28.0	13.9	15.2	20	271
60 / 870	55.7	59.4	33.5	36.3	40	476	23.8	27.5	16.6	18.1	20	309
70 / 1015	54.7	59.2	38.9	42.1	50	523	22.7	27.2	19.3	20.9	25	309
80 / 1160	53.9	58.7	44.4	47.9	50	523	21.9	26.7	22.0	23.9	25	384
90 / 1305	53.1	58.1	49.8	53.6	60	789	20.9	26.2	24.7	26.7	30	384
100 / 1450	52.3	57.9	55.1	59.4	75	955	20.1	25.9	27.5	29.6	30	401
110 / 1595	51.5	57.3	60.6	65.2	75	955	-	25.4	-	32.6	40	512
120 / 1740	50.5	56.8	66.0	70.9	75	955	-	24.8	-	35.4	40	512

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

Viscosity > 90 SSU more power consumption.

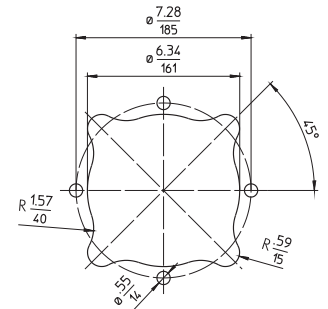


# Characteristics and dimensions

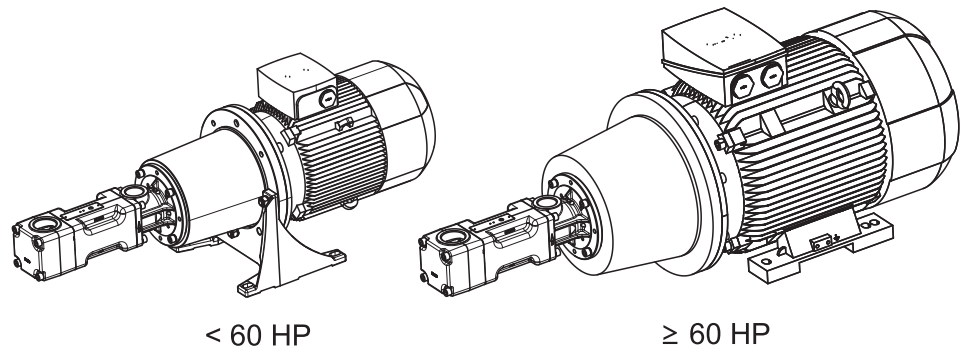
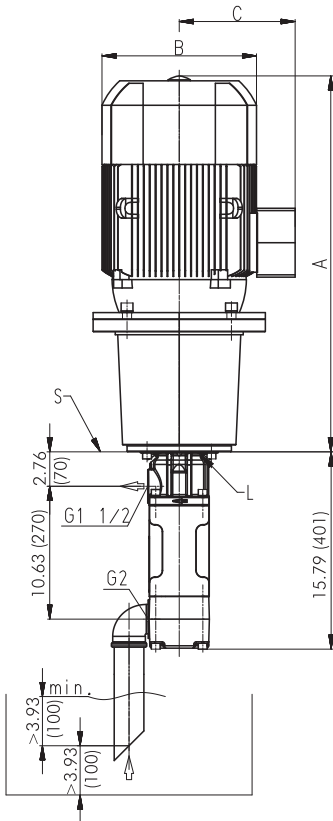
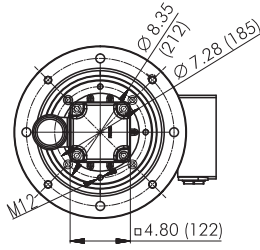
## TFS4, FFS4

### Mounting hole patterns

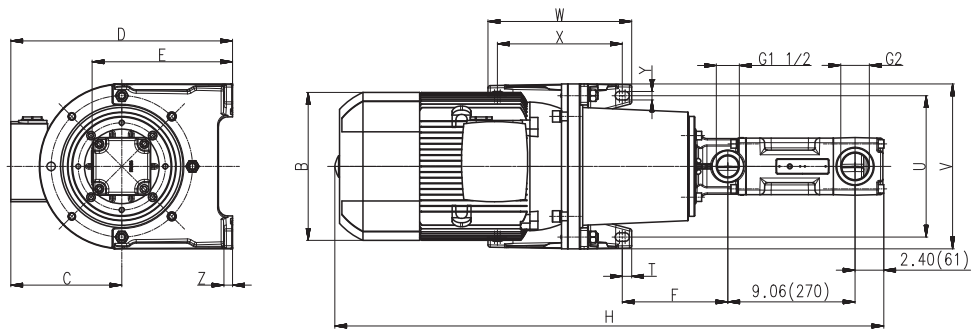
#### TFS3 / TFS4



Dimensions in Inches / mm  
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 HP	Power 4-poles HP	A	B	C	D	E	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
-	3 / 4	22.36	7.80	6.54	12.64	8.58	7.40	38.15	0.89	8.46	9.84	9.06	7.28	0.55	0.59
-	5	21.69	8.74	6.97	13.07	8.58	7.40	37.48	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	-	23.98	10.31	7.95	15.24	9.76	7.83	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	7.5	25.94	10.31	7.95	15.24	9.76	7.83	41.73	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	10	26.30	10.31	7.95	15.24	9.76	7.83	42.09	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.08	12.36	9.33	18.58	11.73	8.82	45.87	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	20	32.44	12.36	9.33	18.58	11.73	8.82	48.23	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	25	32.60	14.02	11.26	20.51	11.73	8.82	48.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	-	32.44	14.02	11.26	20.51	11.73	8.82	48.23	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	30	33.78	14.02	11.26	20.51	11.73	8.82	49.57	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	-	34.68	15.59	12.40	22.64	12.72	8.43	50.47	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	40	35.67	15.59	12.40	22.64	12.72	8.43	51.46	0.98	13.78	15.75	13.78	11.81	0.71	0.79
60	-	38.74	17.68	13.31	22.17	11.34	19.49	54.53	0.98	14.02	17.17	14.21	12.24	0.75	1.34
75	-	41.57	19.57	16.14	25.98	12.32	21.54	57.36	1.18	15.98	19.29	16.10	13.74	0.94	1.57

# 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 of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU	NEMA		5 SSU	90 SSU	5 SSU	90 SSU	NEMA	
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS574/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 77.0</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 38.5</b>		-	-	-	-
10 / 145	74.0	75.3	8.3	9.4	15	313	35.4	36.7	3.9	4.6	7.5	218
20 / 290	72.9	74.8	14.8	16.2	20	333	34.3	36.2	7.2	8.0	10	287
30 / 435	71.9	74.2	21.3	23.1	30	432	33.3	35.7	10.5	11.4	15	331
40 / 580	71.1	73.7	27.8	29.8	40	536	32.5	35.4	13.7	14.9	20	331
50 / 725	70.3	73.4	34.3	36.6	40	536	31.7	34.9	16.9	18.4	20	368
60 / 870	69.2	72.9	40.9	43.4	50	582	30.9	34.3	20.2	21.7	25	368
70 / 1015	68.7	72.4	47.3	50.3	60	849	30.1	34.1	23.5	25.2	30	443
80 / 1160	67.9	72.1	53.9	57.1	60	849	29.3	33.6	26.7	28.7	30	461
90 / 1305	67.1	71.6	60.3	64.0	75	1014	28.5	33.3	29.9	32.1	40	461
100 / 1450	66.6	71.3	66.9	70.7	75	1014	27.7	32.8	33.3	35.5	40	571
110 / 1595	65.8	71.1	73.4	77.5	100	1290	-	32.5	-	39.0	40	571
120 / 1740	65.3	70.5	79.9	84.4	100	1290	-	32.2	-	42.4	50	571
<b>TFS5100/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 104.1</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 52.0</b>		-	-	-	-
10 / 145	99.9	102.0	10.6	11.7	15	313	47.8	49.9	5.1	5.8	7.5	287
20 / 290	98.8	101.2	19.3	20.9	25	355	46.8	49.1	9.5	10.5	15	287
30 / 435	97.8	100.7	28.2	30.3	40	536	45.7	48.6	13.9	15.2	20	331
40 / 580	96.7	100.1	37.0	39.6	50	582	44.6	48.1	18.2	19.8	25	368
50 / 725	95.6	99.6	45.7	48.8	60	849	43.6	47.6	22.7	24.5	30	443
60 / 870	94.6	99.1	54.6	58.2	75	1014	42.5	47.0	27.1	29.2	30	461
70 / 1015	93.8	98.5	63.4	67.5	75	1014	41.7	46.5	31.5	33.9	40	571
80 / 1160	92.7	98.0	72.1	76.8	100	1290	40.7	46.0	35.9	38.6	40	571
90 / 1305	91.9	97.5	81.0	86.1	100	1290	39.6	45.4	40.4	43.3	50	571
100 / 1450	91.1	97.2	89.8	95.3	100	1290	38.8	45.2	44.7	48.0	50	783
110 / 1595	90.4	96.7	98.6	104.7	125	1466	-	44.6	-	52.7	60	783
120 / 1740	89.3	96.4	107.4	114.0	125	1466	-	44.4	-	57.4	60	860

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

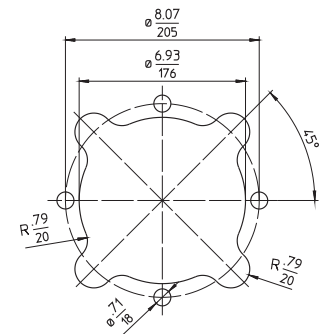
Viscosity > 90 SSU more power consumption.

# Characteristics and dimensions

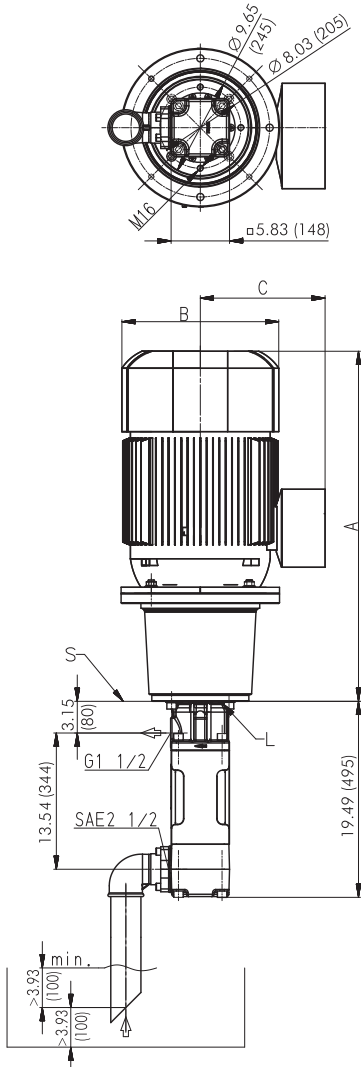
## TFS5, FFS5

### Mounting hole patterns

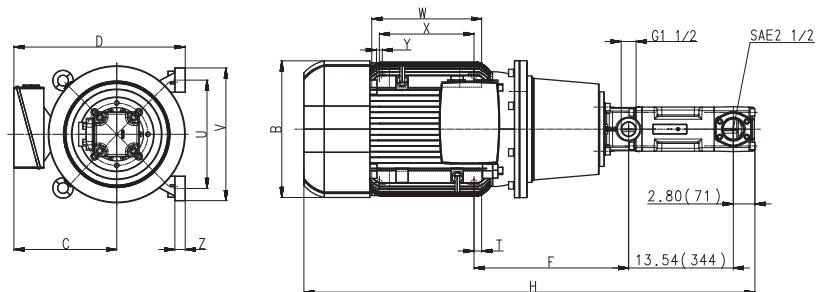
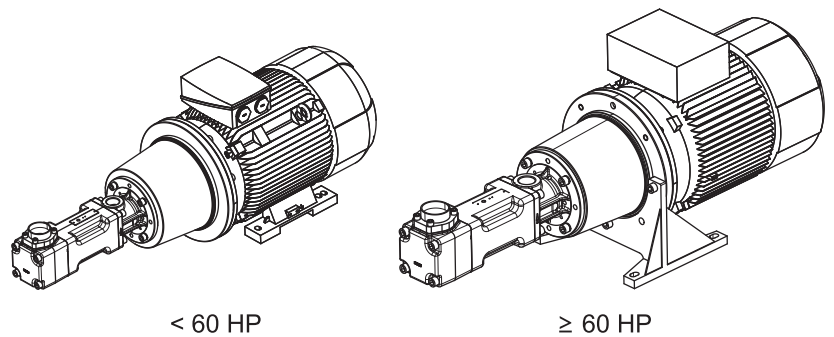
#### TFS5



Dimensions in Inches / mm  
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 HP	Power 4-poles HP	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
-	7.5	26.46	10.31	7.95	15.24	8.74	45.94	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	10	26.81	10.31	7.95	15.24	8.74	46.30	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.20	12.36	9.33	18.58	9.33	49.68	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	20	32.56	12.36	9.33	18.58	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	30	32.56	14.02	11.26	20.51	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	30	33.90	14.02	11.26	20.51	9.33	53.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	-	34.80	15.59	12.40	22.64	8.94	54.29	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	40	35.79	15.59	12.40	22.64	8.94	55.28	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	50	36.57	17.68	13.31	24.92	8.78	55.98	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	60	38.86	17.68	13.31	22.17	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
75	-	41.69	19.57	16.14	25.98	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
100	-	44.57	21.69	17.05	28.07	22.91	64.05	2.19	17.99	21.26	18.86	14.49	0.94	1.57
125	-	48.94	21.69	17.05	28.07	22.91	68.43	1.18	17.99	21.26	18.86	16.50	0.94	1.57

# High Pressure Pumps

## TFS5, FFS5

### Screw spindles



CC311B

Pressure max.	2-pole motor rotation speed 3500 RPM						4-pole motor rotation speed 1750 RPM					
	Flow at viscosity		Power consumption of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU	NEMA		5 SSU	90 SSU	5 SSU	90 SSU	NEMA	
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS5120/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 124.9</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 62.5</b>		-	-	-	-
10 / 145	119.7	122.3	12.3	13.4	20	333	57.3	60.0	5.9	6.7	10	287
20 / 290	118.1	121.5	22.9	24.7	30	432	55.7	58.9	11.3	12.3	15	331
30 / 435	116.8	120.7	33.4	35.8	40	536	54.2	58.1	16.5	18.0	20	368
40 / 580	115.2	119.9	44.0	47.1	50	582	52.8	57.6	21.9	23.6	25	443
50 / 725	113.9	119.4	54.6	58.3	75	1014	51.5	56.8	27.1	29.2	30	461
60 / 870	112.5	118.6	65.2	69.6	75	1014	50.2	56.3	32.3	35.0	40	571
70 / 1015	111.2	118.1	75.8	80.7	100	1290	48.9	55.5	37.7	40.6	50	571
80 / 1160	110.2	117.6	86.2	92.0	100	1290	47.6	55.0	42.9	46.3	50	783
90 / 1305	108.9	117.0	96.8	103.3	125	1466	46.2	54.4	48.3	51.9	60	783
100 / 1450	107.8	116.5	107.4	114.5	125	1466	44.9	54.2	53.5	57.5	60	860
110 / 1595	106.5	116.2	118.0	125.7	150	1819	-	53.6	-	63.2	75	860
120 / 1740	105.4	115.7	128.5	136.9	150	1819	-	53.4	-	68.8	75	1091
<b>TFS5130/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 135.3</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 67.7</b>		-	-	-	-
10 / 145	129.7	132.1	13.1	15.7	20	333	62.1	64.2	6.4	7.2	10	287
20 / 290	127.9	130.8	24.7	27.2	40	536	60.2	63.1	12.1	13.1	15	331
30 / 435	126.0	129.5	36.1	38.9	50	582	58.4	61.8	17.8	19.0	20	368
40 / 580	124.4	128.4	47.6	50.4	60	849	56.8	60.8	23.6	24.9	30	461
50 / 725	122.9	127.3	59.0	62.0	75	1014	55.2	59.4	29.2	30.8	40	571
60 / 870	121.3	126.0	70.4	73.5	100	1290	53.6	58.4	35.0	36.6	40	571
70 / 1015	119.9	125.2	81.9	85.2	100	1290	52.3	57.3	40.8	42.5	50	571
80 / 1160	118.6	124.2	93.3	96.7	100	1290	51.0	56.5	46.5	48.4	50	783
90 / 1305	117.3	123.1	104.7	108.2	125	1466	49.4	55.5	52.2	54.3	60	783
100 / 1450	116.2	122.3	116.3	119.8	125	1466	48.1	54.7	57.9	60.2	75	860
110 / 1595	-	121.5	-	131.4	150	1819	-	53.9	-	66.1	75	860
120 / 1740	-	120.7	-	143.0	150	1819	-	53.1	-	72.0	75	1091

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

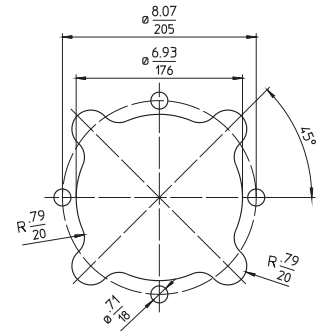
Viscosity > 90 SSU more power consumption.

# Characteristics and dimensions

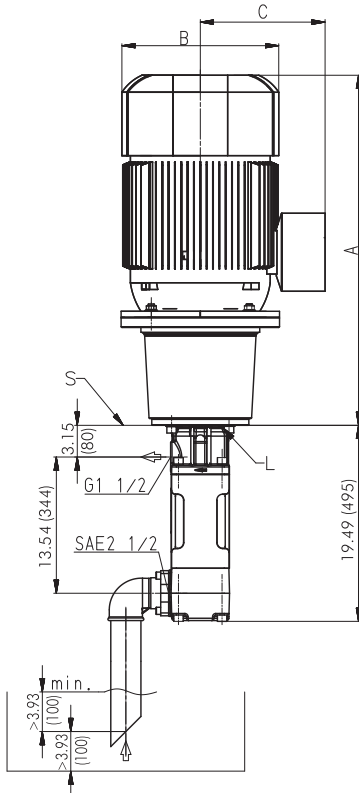
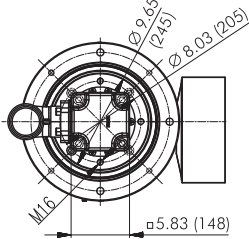
## TFS5, FFS5

### Mounting hole patterns

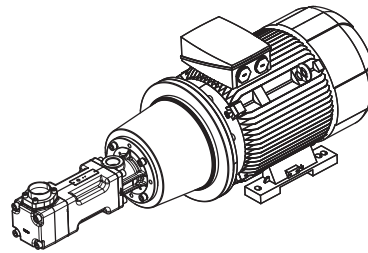
#### TFS5



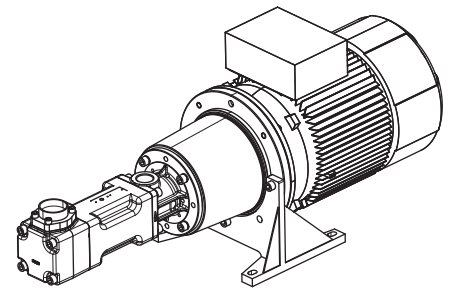
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



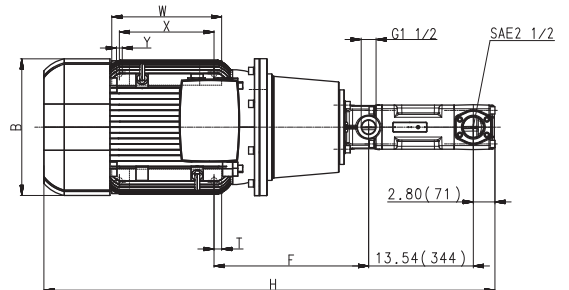
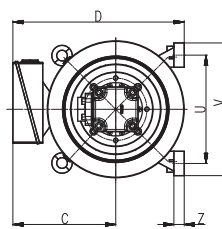
\*) Dimensions for 4-pole standard motor upon request  
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 60 HP



≥ 60 HP



Power 2-poles HP	Power 4-poles HP	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
–	10	26.81	10.31	7.95	15.24	8.74	46.30	0.89	10.43	11.81	10.63	8.86	0.55	0.71
20	15	30.20	12.36	9.33	18.58	9.33	49.68	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	20	32.56	12.36	9.33	18.58	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	–	32.56	14.02	11.26	20.51	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	30	33.90	14.02	11.26	20.51	9.33	53.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	–	34.80	15.59	12.40	22.64	8.94	54.29	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	40	35.79	15.59	12.40	22.64	8.94	55.28	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	50	36.57	17.68	13.31	24.92	8.78	55.98	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	60	38.86	17.68	13.31	22.17	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
75	75	41.69	19.57	16.14	25.98	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
100	–	44.57	21.69	17.05	28.07	22.91	64.05	2.19	17.99	21.26	18.86	14.49	0.94	1.57
125	–	48.94	21.69	17.05	28.07	22.91	68.43	1.18	17.99	21.26	18.86	16.50	0.94	1.57
150	–	48.78	24.25	20.28	32.68	24.53	68.27	1.38	20.00	24.02	20.75	15.98	1.10	1.97

# 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 of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU	NEMA		5 SSU	90 SSU	5 SSU	90 SSU	NEMA	
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS690/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 146.4</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 73.2</b>		-	-	-	-
10 / 145	142.7	144.0	15.6	17.8	25	461	69.5	70.8	7.5	8.3	10	392
20 / 290	140.6	142.7	28.0	30.3	40	642	67.4	69.5	13.7	14.5	20	437
30 / 435	138.4	141.3	40.4	42.6	50	688	65.3	68.2	20.0	20.8	25	474
40 / 580	136.3	140.3	52.7	55.0	60	955	63.1	67.1	26.1	27.0	30	567
50 / 725	134.5	139.2	65.2	67.5	75	1120	61.3	66.1	32.3	33.1	40	677
60 / 870	132.6	138.2	77.5	79.8	100	1396	59.4	65.0	38.5	39.3	50	677
70 / 1015	131.0	137.1	89.8	92.1	100	1396	57.9	63.9	44.7	45.5	50	889
80 / 1160	129.5	136.1	102.3	104.6	125	1572	56.3	62.9	50.8	51.6	60	889
<b>TFS6120/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 195.2</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 97.5</b>		-	-	-	-
10 / 145	190.2	191.8	19.7	22.0	30	536	92.7	94.3	9.7	10.5	15	437
20 / 290	187.6	190.5	36.2	38.5	50	688	90.1	92.7	17.8	18.6	25	474
30 / 435	185.2	188.9	52.7	55.0	60	955	87.5	91.4	26.1	27.0	30	549
40 / 580	182.8	187.6	69.2	71.5	100	1396	85.1	89.8	34.3	35.1	40	677
50 / 725	180.4	186.0	85.8	88.1	100	1396	83.0	88.5	42.6	43.4	50	677
60 / 870	178.6	184.7	102.3	104.6	125	1572	80.8	87.2	50.8	51.6	60	889
70 / 1015	176.5	183.6	118.8	121.1	150	1923	79.0	85.9	59.1	59.9	75	966
80 / 1160	174.1	182.0	135.4	138.1	150	1923	76.6	84.5	67.3	68.1	75	1197
<b>TFS6145/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 235.9</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 117.8</b>		-	-	-	-
10 / 145	229.9	232.0	23.2	25.5	40	642	112.0	114.1	11.3	12.1	15	437
20 / 290	226.4	229.3	43.2	45.5	60	955	108.6	111.5	21.3	22.1	25	549
30 / 435	223.2	226.9	63.0	65.3	75	1120	105.2	109.1	31.2	32.1	40	677
40 / 580	220.1	224.8	83.0	85.3	100	1396	102.0	107.0	41.3	42.1	50	677
50 / 725	217.2	223.0	103.0	105.3	125	1572	99.1	104.9	51.2	52.0	60	889
60 / 870	214.3	221.1	123.0	125.3	150	1923	96.4	103.3	61.2	62.0	75	966
70 / 1015	211.1	219.0	143.0	145.2	150	1923	93.3	100.9	71.2	72.0	75	1197

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

Viscosity > 90 SSU more power consumption.

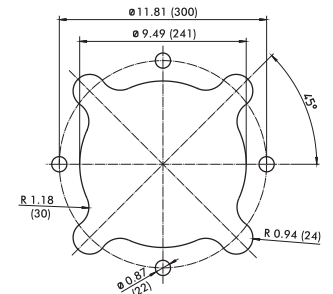
All 6 series screw pumps with an operating flow rate of 210 GPM / 800 l/min or above must be operated with a feed pump which supplies fluid with at least 14.5 psi / 1 bar of pressure to the pump inlet.

# Characteristics and dimensions

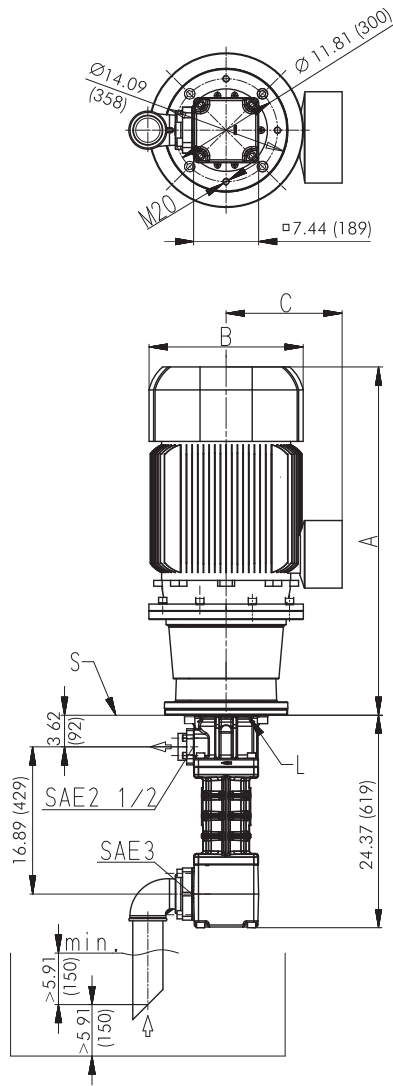
## TFS6, FFS6

### Mounting hole patterns

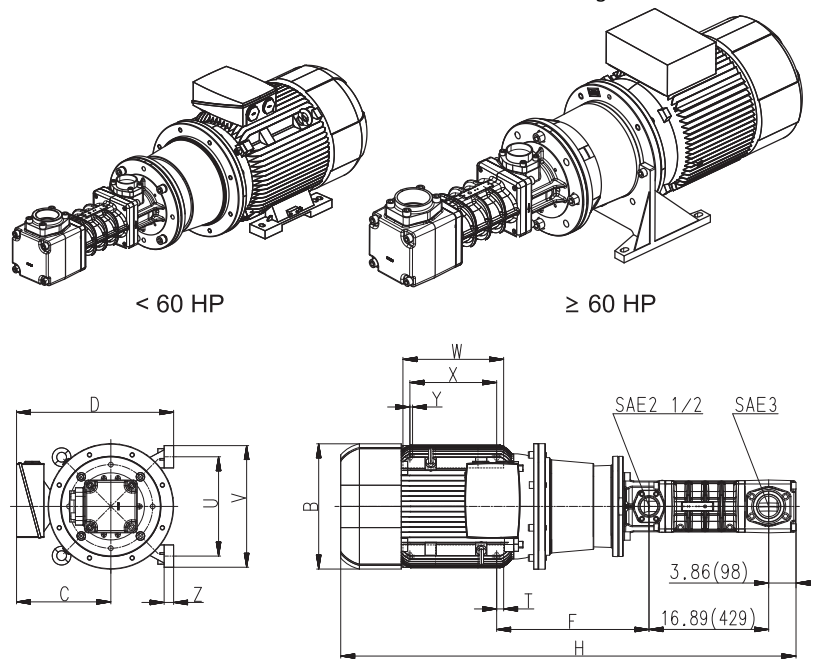
#### TFS6



Dimensions in inches / mm  
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 HP	Power 4-poles HP	A Inch	B Inch	C Inch	D Inch	F Inch	H Inch	T Inch	U Inch	V Inch	W Inch	X Inch	Y Inch	Z Inch
-	10	28.46	10.31	7.95	15.24	9.53	52.83	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	15	31.30	12.36	9.33	18.58	9.53	55.67	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	20	33.66	12.36	9.33	18.58	10.43	58.03	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	-	33.66	12.36	9.33	19.57	9.53	58.03	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	25	33.82	14.02	11.26	20.51	10.43	58.19	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	-	33.66	14.02	11.26	21.50	9.53	58.03	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	30	35.00	14.02	11.26	20.51	15.63	59.37	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	-	35.83	15.59	12.40	22.64	10.43	60.20	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	40	36.81	15.59	12.40	22.64	16.42	61.18	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	-	36.81	15.59	12.40	22.64	10.43	61.18	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	50	38.31	17.68	13.31	22.64	17.01	62.68	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	-	39.88	17.68	13.31	22.17	21.50	64.25	0.98	14.02	17.17	14.21	12.24	0.75	1.34
-	60	39.88	17.68	13.31	22.17	21.50	64.25	0.98	14.02	19.29	17.17	12.24	0.75	1.34
75	-	42.20	19.57	16.14	25.98	23.03	66.57	1.18	15.98	19.29	16.10	13.74	0.94	1.57
-	75	42.80	19.57	16.14	25.98	23.62	67.17	1.18	15.98	19.29	16.10	13.74	0.94	1.57
100	-	45.67	21.69	17.05	28.07	24.49	70.04	2.19	17.99	21.26	18.86	14.49	0.94	1.57
125	-	50.00	21.69	17.05	28.07	24.49	74.37	1.18	17.99	21.26	18.86	16.50	0.94	1.57
150	-	48.90	24.25	20.28	32.68	25.12	73.27	2.38	20.00	24.02	20.75	15.98	1.10	1.97



# High Pressure Pumps



## BFS1, FFS1

50 Hz

### Screw spindles

Pressure max.	Flow at viscosity		2-pole motor rotation speed 2900 RPM					4-pole motor rotation speed 1450 RPM					
			Power consumption of viscosity		Motor immersion version	Motor foot mounted version	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
			5 SSU	90 SSU				5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>BFS130/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 4.1</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 2.1</b>		-	-	-	-
10 / 145	3.7	4.0	0.7	0.7	B 1.7	1	86	1.6	1.9	0.3	0.3	1	66
20 / 290	3.5	3.9	1.1	1.1	B 1.7	1.5	86	1.4	1.8	0.5	0.5	1	66
30 / 435	3.2	3.8	1.3	1.3	B 1.7	2	86	1.1	1.7	0.7	0.7	1	66
40 / 580	3.0	3.7	1.7	1.7	B 2	2	86	0.9	1.6	0.8	0.9	1	66
50 / 725	2.7	3.6	2.0	2.1	B 2.3	3	88	-	1.5	-	1.1	1.5	71
60 / 870	2.5	3.5	2.4	2.5	B 2.9	3	97	-	1.4	-	1.2	1.5	71
70 / 1015	2.3	3.4	2.8	2.8	B 3.5	4	99	-	1.3	-	1.5	2	75
80 / 1160	2.1	3.3	3.1	3.2	B 3.5	4	99	-	1.2	-	1.6	2	75
90 / 1305	1.9	3.2	3.5	3.6	B 4	4	126	-	1.1	-	1.7	2	75
100 / 1450	1.7	3.1	3.8	3.9	B 4.4	5.4	126	-	1.1	-	2.0	3	99
110 / 1595	1.5	3.0	4.2	4.3	B 4.4	5.4	126	-	-	-	-	-	-
120 / 1740	1.3	3.0	4.6	4.7	B 5.4	5.4	128	-	-	-	-	-	-
130 / 1885	-	2.9	-	5.1	B 5.4	5.4	128	-	-	-	-	-	-
140 / 2030	-	2.8	-	5.4	B 6.7	7.5	139	-	-	-	-	-	-
150 / 2175	-	2.7	-	5.8	B 6.7	7.5	139	-	-	-	-	-	-
<b>BFS140/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 5.5</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 2.8</b>		-	-	-	-
10 / 145	5.0	5.3	0.8	0.9	B 1.7	1.5	86	2.2	2.5	0.4	0.4	1	66
20 / 290	4.6	5.2	1.2	1.3	B 1.7	2	86	1.9	2.4	0.5	0.7	1	66
30 / 435	4.3	5.0	1.7	1.9	B 2	2	86	1.5	2.3	0.8	0.9	1.5	71
40 / 580	4.0	4.9	2.1	2.3	B 2.5	3	97	1.2	2.1	1.1	1.2	1.5	71
50 / 725	3.7	4.8	2.7	2.8	B 2.9	4	97	1.0	2.0	1.3	1.5	2	75
60 / 870	3.4	4.6	3.1	3.4	B 3.5	4	99	0.7	1.9	1.5	1.7	2	75
70 / 1015	3.2	4.5	3.6	3.8	B 4.4	4	126	-	1.7	-	1.9	3	99
80 / 1160	2.9	4.4	4.0	4.3	B 4.4	5.4	126	-	1.6	-	2.1	3	99
90 / 1305	2.7	4.3	4.6	4.7	B 5.4	5.4	128	-	1.5	-	2.4	3	99
100 / 1450	2.5	4.1	5.0	5.2	B 5.4	7.5	132	-	1.4	-	2.7	3	99
110 / 1595	2.2	4.0	5.5	5.8	B 6.7	7.5	139	-	-	-	-	-	-
120 / 1740	1.9	3.9	5.9	6.2	B 6.7	7.5	139	-	-	-	-	-	-
130 / 1885	1.7	3.8	6.4	6.7	B 7.4	7.5	139	-	-	-	-	-	-
140 / 2030	-	3.7	-	7.1	B 7.4	7.5	139	-	-	-	-	-	-
150 / 2175	-	3.6	-	7.6	B 8	10	192	-	-	-	-	-	-

<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

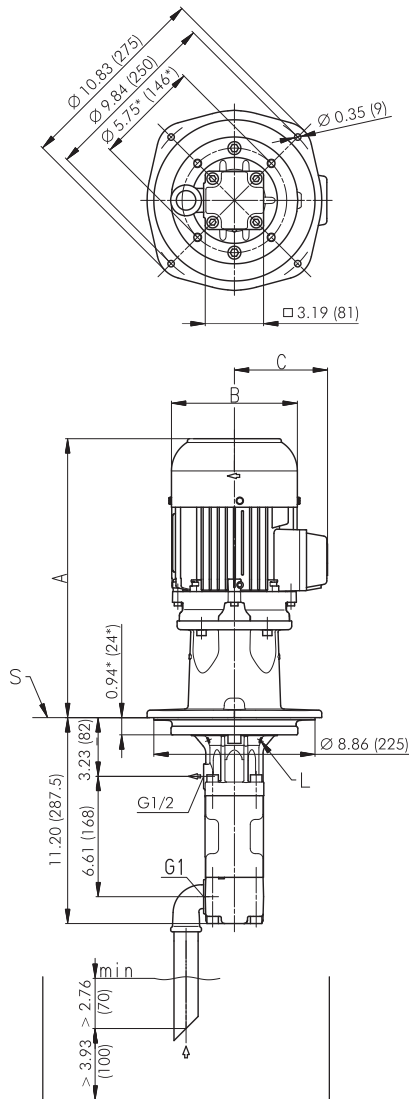
Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.



# Characteristics and dimensions

## BFS1, FFS1

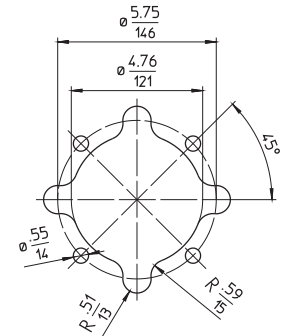
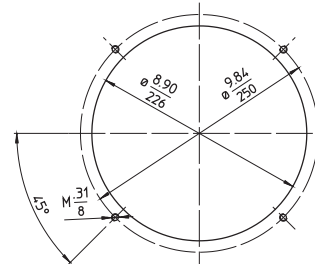
50 Hz



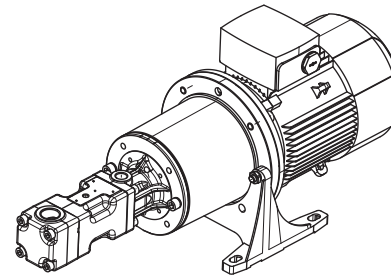
### Mounting hole patterns

BFS1 / BFS2

TFS1 / TFS2



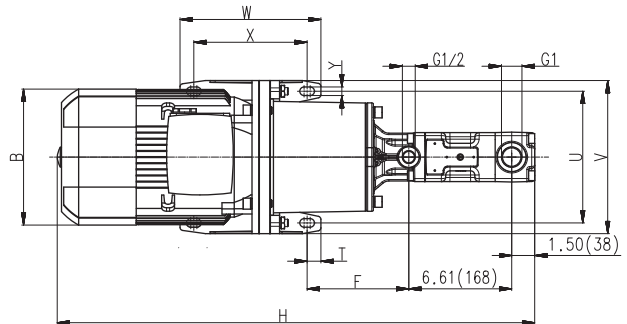
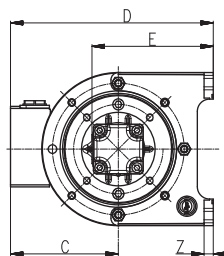
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 HP	A Inch	B Inch	C Inch
B 1.7 / 2	16.34	6.93	5.12
B 2.3	17.36	6.93	5.12
B 2.5 / 2.9 / 3.5	18.66	6.93	5.12
B 4 / 4.4 / 5.4	20.20	8.58	5.91
B 6.7 / 7.4	21.38	8.58	5.91
B 8	22.99	10.16	7.60

Power 2-poles HP	Power 4-poles HP	B Inch	C Inch	D Inch	E Inch	F Inch	H Inch	T Inch	U Inch	V Inch	W Inch	X Inch	Y Inch	Z Inch
1	–	6.26	4.76	9.17	6.10	5.43	26.61	0.59	7.09	8.27	3.54	2.36	0.43	0.47
–	1	6.26	4.76	9.17	6.10	5.43	29.57	0.59	7.09	8.27	3.54	2.36	0.43	0.47
1.5	–	6.26	4.76	9.17	6.10	5.43	27.99	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2	1.5 / 2	7.01	4.96	9.37	6.10	5.43	28.39	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	–	7.01	4.96	9.37	6.10	5.43	29.96	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3	7.80	6.54	12.64	7.80	6.54	32.32	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5.4	–	8.74	6.97	13.07	7.80	6.54	31.69	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	–	10.31	7.95	15.24	8.98	6.73	33.74	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	–	10.31	7.95	15.24	8.98	6.73	35.71	0.89	10.43	11.81	10.63	8.86	0.55	0.71

# High Pressure Pumps



## BFS2, FFS2

50 Hz

### Screw spindles

Pressure max.	Flow at viscosity		2-pole motor rotation speed 2900 RPM					4-pole motor rotation speed 1450 RPM					
			Power consumption of viscosity		Motor immersion version	Motor foot mounted version	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
			5 SSU	90 SSU				5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>BFS232/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 6.9</b>		–	–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 3.5</b>		–	–	–	–
10 / 145	6.4	6.7	0.9	1.1	B 1.7	1.5	88	3.0	3.3	0.4	0.7	1	68
20 / 290	6.2	6.7	1.5	1.7	B 2	2	88	2.8	3.2	0.8	0.9	1.5	73
30 / 435	6.1	6.6	2.0	2.3	B 2.5	3	99	2.6	3.1	1.1	1.2	1.5	73
40 / 580	5.9	6.5	2.7	3.0	B 3.5	4	101	2.5	3.1	1.3	1.6	2	77
50 / 725	5.8	6.4	3.2	3.6	B 4	4	128	2.3	3.0	1.6	1.9	2	77
60 / 870	5.6	6.4	3.8	4.2	B 4.4	5.4	128	2.2	2.9	1.9	2.1	3	101
70 / 1015	5.4	6.3	4.4	4.8	B 5.4	5.4	130	2.0	2.9	2.3	2.5	3	101
80 / 1160	5.3	6.2	5.0	5.4	B 6.7	7.5	141	1.8	2.8	2.5	2.8	3	101
90 / 1305	5.2	6.2	5.5	6.0	B 6.7	7.5	141	1.7	2.7	2.8	3.1	4	101
100 / 1450	5.0	6.1	6.2	6.6	B 7.4	7.5	141	1.5	2.6	3.1	3.4	4	101
110 / 1595	4.9	6.1	6.7	7.2	B 7.4	10	165	–	–	–	–	–	–
120 / 1740	4.7	6.0	7.4	7.8	B 10.1	10	207	–	–	–	–	–	–
130 / 1885	4.6	5.9	7.9	8.4	B 10.1	10	207	–	–	–	–	–	–
140 / 2030	4.4	5.8	8.4	9.0	B 10.1	10	207	–	–	–	–	–	–
150 / 2175	4.3	5.8	9.1	9.7	B 10.1	10	207	–	–	–	–	–	–
<b>BFS238/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 8.2</b>		–	–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 4.1</b>		–	–	–	–
10 / 145	7.6	8.0	0.9	0.9	B 1.7	1.5	88	3.5	3.9	0.5	0.5	1	68
20 / 290	7.4	7.9	1.7	1.7	B 2	2	88	3.3	3.8	0.8	0.8	1	68
30 / 435	7.2	7.8	2.4	2.4	B 2.9	3	99	3.1	3.7	1.2	1.2	1.5	73
40 / 580	7.1	7.7	3.1	3.2	B 3.5	4	101	3.0	3.6	1.6	1.6	2	77
50 / 725	6.9	7.6	3.8	3.9	B 4.4	5.4	128	2.8	3.5	1.9	2.0	3	101
60 / 870	6.7	7.6	4.4	4.7	B 5.4	5.4	130	2.6	3.5	2.3	2.4	3	101
70 / 1015	6.5	7.5	5.1	5.4	B 6.7	7.5	141	2.4	3.4	2.5	2.7	3	101
80 / 1160	6.3	7.4	5.9	6.0	B 6.7	7.5	141	2.2	3.3	3.0	3.1	4	101
90 / 1305	6.1	7.3	6.6	6.8	B 7.4	7.5	141	2.0	3.2	3.4	3.5	4	101
100 / 1450	5.9	7.3	7.2	7.5	B 8	10	192	1.8	3.2	3.6	3.9	4	101
110 / 1595	5.8	7.2	7.9	8.3	B 8.7	10	192	–	–	–	–	–	–
120 / 1740	5.6	7.1	8.6	9.1	B 10.1	10	207	–	–	–	–	–	–
130 / 1885	5.4	7.1	9.3	9.8	B 12.1	15	220	–	–	–	–	–	–
140 / 2030	5.3	7.0	10.1	10.6	B 12.1	15	220	–	–	–	–	–	–
150 / 2175	5.1	6.9	10.7	11.3	B 12.1	15	220	–	–	–	–	–	–

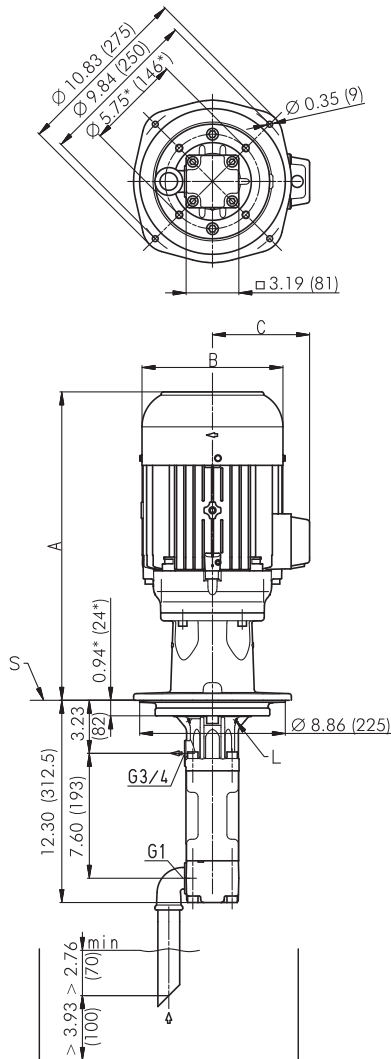
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.

# Characteristics and dimensions

## BFS2, FFS2

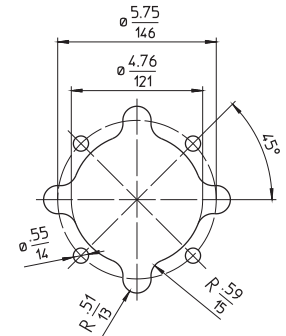
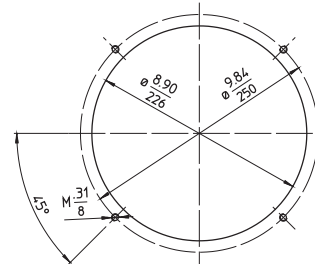
50 Hz



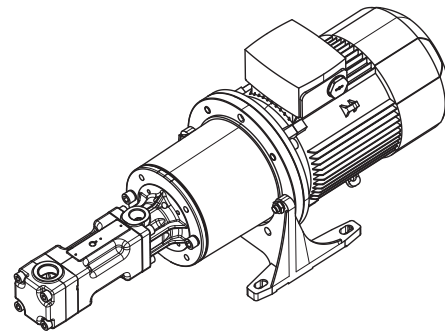
### Mounting hole patterns

BFS1 / BFS2

TFS1 / TFS2

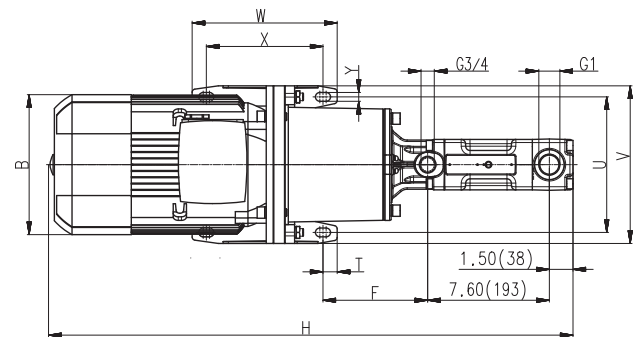
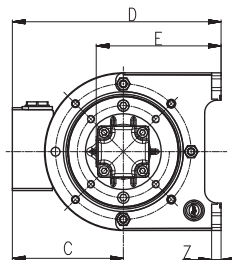


Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 HP	A Inch	B Inch	C Inch
B 1.7 / 2	16.34	6.93	5.12
B 2.5 / 2.9 / 3.5	18.66	6.93	5.12
B 4 / 4.4 / 5.4	20.20	8.58	5.91
B 6.7 / 7.4	21.38	10.16	7.48
B 8 / 8.7	22.99	10.16	7.60
B 10.1 / 12.1	24.49	10.16	7.60

Power 2-poles HP	Power 4-poles HP	B Inch	C Inch	D Inch	E Inch	F Inch	H Inch	T Inch	U Inch	V Inch	W Inch	X Inch	Y Inch	Z Inch
-	1	6.26	4.76	9.17	6.10	5.43	30.55	0.59	7.09	8.27	3.54	2.36	0.43	0.47
1.5	-	6.26	4.76	9.17	6.10	5.43	28.98	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2	1.5 / 2	7.01	4.96	9.37	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	-	7.01	4.96	9.37	6.10	5.43	30.94	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3 / 4	7.80	6.54	12.64	7.80	6.54	33.31	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5.4	-	8.74	6.97	13.07	7.80	6.54	32.68	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	-	10.31	7.95	15.24	8.98	6.73	34.72	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	-	10.31	7.95	15.24	8.98	6.73	36.69	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15	-	12.36	9.33	18.58	10.94	8.27	41.38	0.79	11.81	13.78	12.01	10.43	0.71	0.71

# High Pressure Pumps



## BFS2, FFS2

50 Hz

### Screw spindles

Pressure max.	Flow at viscosity		2-pole motor rotation speed 2900 RPM					4-pole motor rotation speed 1450 RPM					
			Power consumption of viscosity		Motor immersion version	Motor foot mounted version	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
			5 SSU	90 SSU				5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>BFS250/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 10.8</b>		–	–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 5.4</b>		–	–	–	–
10 / 145	10.0	10.5	1.2	1.2	B 1.7	2	88	4.6	5.1	0.7	0.7	1	68
20 / 290	9.8	10.4	2.1	2.1	B 2.5	3	99	4.4	5.0	1.1	1.1	1.5	73
30 / 435	9.5	10.3	3.1	3.1	B 3.5	4	101	4.1	4.9	1.6	1.6	2	77
40 / 580	9.3	10.2	4.0	4.2	B 4.4	5.4	128	3.9	4.8	2.0	2.1	3	101
50 / 725	9.1	10.1	4.8	5.1	B 5.4	5.4	130	3.7	4.7	2.4	2.5	3	101
60 / 870	8.9	10.0	5.8	6.0	B 6.7	7.5	141	3.5	4.6	3.0	3.1	4	101
70 / 1015	8.6	9.9	6.7	7.0	B 7.4	7.5	141	3.2	4.5	3.4	3.5	4	101
80 / 1160	8.4	9.8	7.6	7.9	B 8.7	10	192	3.0	4.4	3.9	4.0	5.4	110
90 / 1305	8.2	9.7	8.6	8.9	B 10.1	10	207	2.8	4.3	4.3	4.4	5.4	110
100 / 1450	8.1	9.6	9.4	9.9	B 12.1	15	220	2.6	4.2	4.7	5.0	5.4	110
110 / 1595	7.7	9.5	10.3	10.9	B 12.1	15	220	–	–	–	–	–	–
120 / 1740	7.4	9.4	11.3	11.8	B 14.7	15	269	–	–	–	–	–	–
130 / 1885	7.0	9.3	12.2	12.7	B 14.7	15	269	–	–	–	–	–	–
140 / 2030	6.7	9.2	13.1	13.7	B 14.7	15	269	–	–	–	–	–	–
150 / 2175	6.4	9.1	13.9	14.8	B 17.4	20	269	–	–	–	–	–	–
<b>BFS260/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 12.9</b>		–	–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 6.5</b>		–	–	–	–
10 / 145	12.0	12.5	1.3	1.5	B 2.3	3	90	5.5	6.1	0.7	0.8	1	68
20 / 290	11.7	12.4	2.5	2.7	B 3.5	4	101	5.3	5.9	1.2	1.3	2	77
30 / 435	11.4	12.2	3.6	3.9	B 4.4	5.4	128	4.9	5.8	1.9	1.9	3	101
40 / 580	11.1	12.1	4.7	5.1	B 6.7	7.5	141	4.6	5.6	2.4	2.5	3	101
50 / 725	10.8	11.9	5.8	6.2	B 6.7	7.5	141	4.3	5.5	3.0	3.1	4	101
60 / 870	10.5	11.8	6.8	7.4	B 8	10	192	4.0	5.3	3.5	3.8	4	101
70 / 1015	10.2	11.6	7.9	8.6	B 10.1	10	207	3.7	5.1	4.0	4.3	5.4	110
80 / 1160	9.9	11.4	9.1	9.8	B 12.1	15	220	3.4	5.0	4.6	5.0	5.4	110
90 / 1305	9.6	11.3	10.2	10.9	B 12.1	15	220	3.1	4.8	5.1	5.5	7.5	181
100 / 1450	9.2	11.1	11.4	12.1	B 14.7	15	269	2.8	4.6	5.8	6.0	7.5	181
110 / 1595	8.8	10.9	12.5	13.3	B 14.7	15	269	–	–	–	–	–	–
120 / 1740	8.4	10.8	13.4	14.5	B 14.7	15	269	–	–	–	–	–	–
130 / 1885	8.0	10.4	14.6	15.7	B 17.4	20	269	–	–	–	–	–	–
140 / 2030	7.5	10.1	15.7	16.8	B 17.4	20	269	–	–	–	–	–	–
150 / 2175	7.1	9.8	16.8	18.0	–	20	227	–	–	–	–	–	–

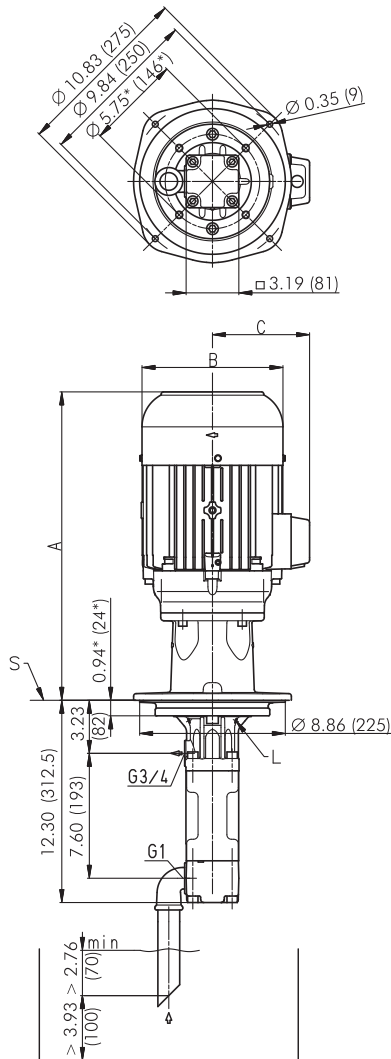
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.

# Characteristics and dimensions

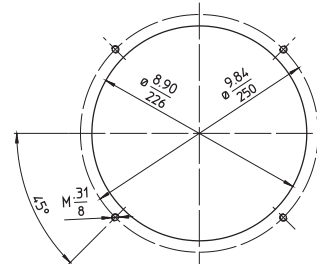
## BFS2, FFS2

50 Hz

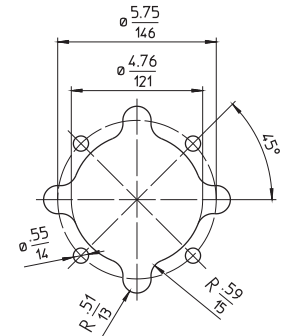


### Mounting hole patterns

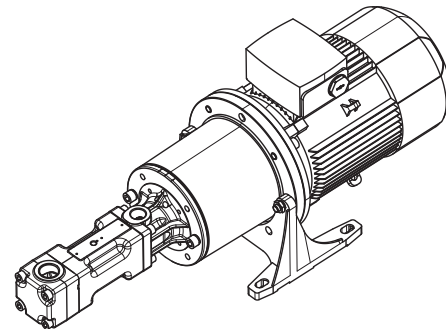
BFS1 / BFS2



TFS1 / TFS2

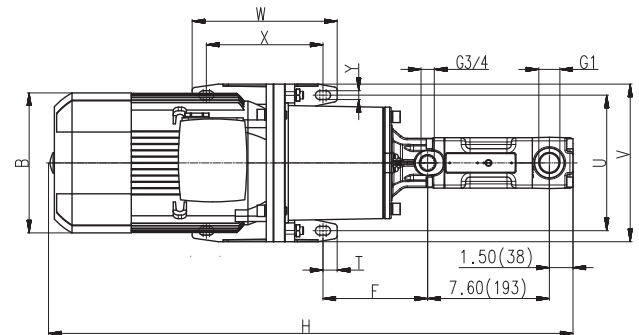
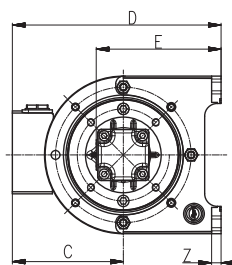


Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 HP	A	B	C
	Inch	Inch	Inch
B 1.7	16.34	6.93	5.12
B 2.3	17.36	6.93	5.12
B 2.5 / 3.5	18.66	6.93	5.12
B 4.4 / 5.4	20.20	8.58	5.91
B 6.7 / 7.4	21.38	10.16	7.48
B 8 / 8.7	22.99	10.16	7.60
B 10.1 / 12.1	24.49	10.16	7.60
B 14.7 / 17.4	24.80	12.20	9.45

Power 2-poles HP	Power 4-poles HP	B	C	D	E	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
-	1	6.26	4.76	9.17	6.10	5.43	30.55	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2	1.5 / 2	7.01	4.96	9.37	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	-	7.01	4.96	9.37	6.10	5.43	30.94	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3 / 4	7.80	6.54	12.64	7.80	6.54	33.31	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5.4	5.4	8.74	6.97	13.07	7.80	6.54	32.68	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	-	10.31	7.95	15.24	8.98	6.73	34.72	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	7.5	10.31	7.95	15.24	8.98	6.73	36.69	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	-	12.36	9.33	18.58	10.94	8.27	41.38	0.79	11.81	13.78	12.01	10.43	0.71	0.71

# 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 of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU			5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS348/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 16.9</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 8.5</b>		–	–	–	–
10 / 145	15.9	16.5	2.0	2.1	3	104	7.4	8.0	0.9	1.1	1.5	97
20 / 290	15.5	16.2	3.4	3.8	5.4	137	7.0	7.8	1.6	1.7	2	104
30 / 435	15.1	16.0	4.8	5.2	7.5	159	6.6	7.6	2.4	2.5	3	128
40 / 580	14.7	15.8	6.3	6.8	7.5	159	6.2	7.4	3.1	3.2	4	128
50 / 725	14.4	15.6	7.6	8.3	10	190	5.9	7.2	3.8	4.0	5.4	137
60 / 870	14.0	15.5	9.1	9.8	15	232	5.6	7.0	4.6	4.7	5.4	137
70 / 1015	13.7	15.3	10.6	11.4	15	232	5.2	6.8	5.2	5.5	7.5	205
80 / 1160	13.4	15.1	11.9	12.9	15	232	4.9	6.7	5.9	6.3	7.5	205
90 / 1305	13.1	15.0	13.4	14.3	20	251	4.6	6.5	6.7	7.0	7.5	205
100 / 1450	12.8	14.8	14.9	15.8	20	251	4.3	6.4	7.4	7.8	10	205
110 / 1595	12.3	14.7	16.2	17.4	20	251	–	–	–	–	–	–
120 / 1740	11.9	14.6	17.7	19.0	20	251	–	–	–	–	–	–
130 / 1885	11.4	14.5	19.2	20.5	25	273	–	–	–	–	–	–
140 / 2030	11.0	14.4	20.5	22.0	25	273	–	–	–	–	–	–
150 / 2175	10.6	14.3	22.0	23.6	25	273	–	–	–	–	–	–
<b>TFS364/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 22.6</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 11.3</b>		–	–	–	–
10 / 145	21.1	21.9	2.4	2.7	4	119	9.8	10.6	1.2	1.2	2	104
20 / 290	20.6	21.7	4.4	4.7	7.5	159	9.3	10.4	2.1	2.3	3	128
30 / 435	20.2	21.4	6.3	6.7	10	190	8.9	10.1	3.1	3.2	4	128
40 / 580	19.7	21.2	8.2	8.7	10	190	8.4	9.9	4.0	4.3	5.4	137
50 / 725	19.3	20.9	10.1	10.7	15	232	8.0	9.6	5.0	5.2	7.5	205
60 / 870	18.9	20.7	12.1	12.7	15	232	7.6	9.4	5.9	6.3	7.5	205
70 / 1015	18.5	20.5	13.9	14.6	20	251	7.2	9.2	6.8	7.2	10	205
80 / 1160	18.1	20.3	15.8	16.6	20	251	6.8	9.0	7.9	8.2	10	205
90 / 1305	17.7	20.1	17.7	18.6	20	251	6.3	8.8	8.9	9.3	10	205
100 / 1450	17.3	19.9	19.7	20.7	25	273	5.9	8.6	9.8	10.2	15	249
110 / 1595	16.7	19.8	21.6	22.7	25	273	–	–	–	–	–	–
120 / 1740	16.1	19.6	23.5	24.7	30	335	–	–	–	–	–	–
130 / 1885	15.5	19.2	25.3	26.7	30	335	–	–	–	–	–	–
140 / 2030	15.0	18.8	27.4	28.7	30	335	–	–	–	–	–	–
150 / 2175	14.4	18.4	29.2	30.6	40	454	–	–	–	–	–	–
<b>TFS376/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 26.8</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 13.4</b>		–	–	–	–
10 / 145	25.2	26.0	2.8	3.2	5.4	137	11.8	12.6	1.3	1.6	3	128
20 / 290	24.6	25.7	5.1	5.6	7.5	159	11.2	12.3	2.4	2.8	4	128
30 / 435	24.0	25.4	7.4	8.0	10	190	10.6	12.0	3.6	4.0	5.4	137
40 / 580	23.5	25.1	9.7	10.6	15	232	10.1	11.7	4.7	5.2	7.5	205
50 / 725	23.0	24.9	11.9	13.0	15	232	9.6	11.4	5.9	6.4	7.5	205
60 / 870	22.5	24.6	14.2	15.4	20	251	9.1	11.2	7.0	7.6	10	205
70 / 1015	22.0	24.4	16.4	17.8	20	251	8.5	10.9	8.2	8.9	10	205
80 / 1160	21.5	24.1	18.6	20.2	25	273	8.0	10.7	9.3	9.9	15	249
90 / 1305	21.0	23.9	20.9	22.7	25	273	7.5	10.5	10.5	11.3	15	249
100 / 1450	20.5	23.7	23.2	25.2	30	335	7.0	10.3	11.5	12.3	15	249
110 / 1595	19.7	23.5	25.5	27.6	30	335	–	–	–	–	–	–
120 / 1740	18.9	23.3	27.8	30.0	40	454	–	–	–	–	–	–
130 / 1885	18.2	22.8	30.0	32.5	40	454	–	–	–	–	–	–
140 / 2030	17.4	22.4	32.2	34.9	40	454	–	–	–	–	–	–
150 / 2175	16.7	21.9	34.5	37.4	40	454	–	–	–	–	–	–

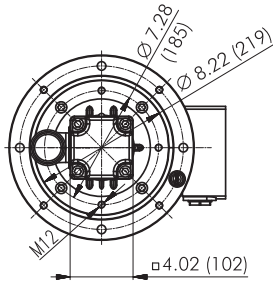
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.

# Characteristics and dimensions

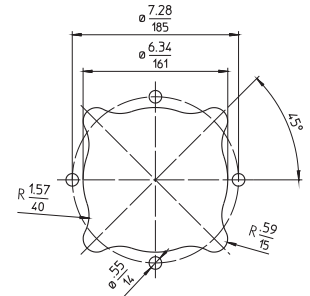
## TFS3, FFS3

### 50 Hz

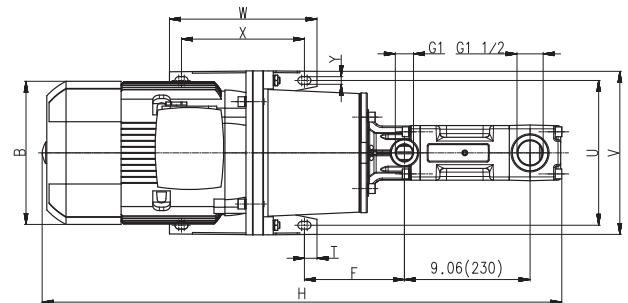
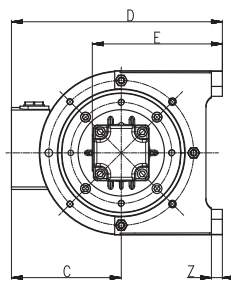
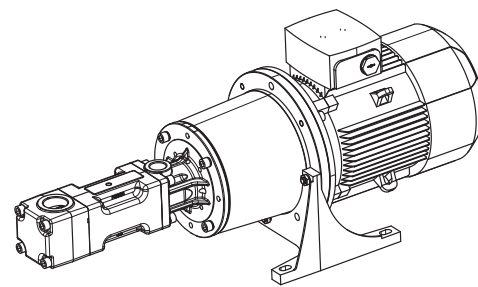
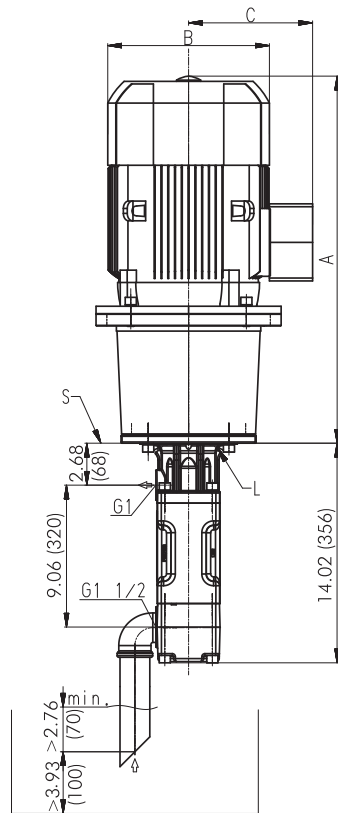


### Mounting hole patterns

TFS3 / TFS4



Dimensions in Inches / mm  
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 HP	Power 4-poles HP	A Inch	B Inch	C Inch	D Inch	E Inch	F Inch	H Inch	T Inch	U Inch	V Inch	W Inch	X Inch	Y Inch	Z Inch
–	1.5 / 2	18.74	7.01	4.96	9.37	6.50	6.57	33.35	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	–	20.31	7.01	4.96	9.37	6.50	6.57	34.92	0.59	7.09	8.27	3.54	2.36	0.43	0.47
4	3 / 4	22.36	7.80	6.54	12.64	8.19	7.32	36.38	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5.4	5.4	21.69	8.74	6.97	13.07	8.19	7.32	35.71	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.5	–	23.43	10.31	7.95	15.24	9.37	7.20	37.44	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	7.5	25.39	10.31	7.95	15.24	9.37	7.20	39.41	0.89	10.43	11.81	10.63	8.86	0.55	0.71
–	10	25.75	10.31	7.95	15.24	9.37	7.20	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.08	12.36	9.33	18.58	11.34	8.74	44.09	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	–	32.44	12.36	9.33	18.58	11.34	8.74	46.46	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	–	32.44	14.02	11.26	20.51	11.34	8.74	46.46	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	–	34.68	15.59	12.40	22.64	12.32	8.35	48.70	0.98	13.78	15.75	13.78	11.81	0.71	0.79



# High Pressure Pumps



## TFS4, FFS4

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 of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU			5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS460/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 33.1</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 16.6</b>		–	–	–	–
10 / 145	31.2	32.2	3.6	4.0	5.4	159	14.5	15.6	1.6	1.7	3	150
20 / 290	30.4	31.7	6.4	7.0	10	212	13.7	15.1	3.1	3.2	4	150
30 / 435	29.6	31.2	9.3	9.9	15	254	13.2	14.8	4.4	4.7	5.4	159
40 / 580	29.1	30.9	12.1	12.9	15	254	12.4	14.3	5.9	6.3	7.5	227
50 / 725	28.3	30.6	14.8	15.8	20	273	11.6	14.0	7.2	7.8	10	227
60 / 870	27.7	30.1	17.6	18.8	20	273	11.1	13.7	8.7	9.3	10	227
70 / 1015	26.9	29.9	20.4	21.6	25	295	10.6	13.2	10.1	10.7	15	271
80 / 1160	26.4	29.6	23.2	24.5	30	357	9.8	12.9	11.5	12.2	15	271
90 / 1305	25.9	29.3	26.0	27.5	30	357	9.2	12.7	12.9	13.8	15	271
100 / 1450	25.4	29.1	28.8	30.4	40	476	8.5	12.4	14.3	15.2	20	309
110 / 1595	24.8	28.8	31.6	33.4	40	476	–	–	–	–	–	–
120 / 1740	24.0	28.5	34.3	36.3	40	476	–	–	–	–	–	–
<b>TFS480/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 44.1</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 22.1</b>		–	–	–	–
10 / 145	41.5	42.8	4.6	5.0	7.5	181	19.6	20.9	2.1	2.4	3	150
20 / 290	40.4	42.3	8.3	8.9	10	212	18.5	20.1	4.0	4.3	5.4	159
30 / 435	39.6	41.7	12.1	12.7	15	254	17.4	19.6	5.9	6.3	7.5	227
40 / 580	38.6	41.2	15.7	16.6	20	273	16.6	19.0	7.8	8.2	10	227
50 / 725	37.8	40.7	19.4	20.4	25	295	15.9	18.5	9.7	10.2	15	271
60 / 870	37.0	40.2	23.2	24.3	30	357	14.8	18.0	11.5	12.3	15	271
70 / 1015	36.2	39.6	27.0	28.2	30	357	14.0	17.7	13.3	14.2	15	271
80 / 1160	35.4	39.4	30.7	32.1	40	476	13.5	17.2	15.2	16.2	20	309
90 / 1305	34.9	38.8	34.5	35.8	40	476	12.4	16.9	17.0	18.2	20	309
100 / 1450	34.1	38.6	38.2	39.7	40	476	11.6	16.6	18.9	20.1	25	384
110 / 1595	33.3	38.3	42.0	43.6	50	523	–	–	–	–	–	–
120 / 1740	32.8	38.0	45.6	47.5	50	523	–	–	–	–	–	–
<b>TFS496/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 53.0</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 26.5</b>		–	–	–	–
10 / 145	49.9	51.3	5.2	5.9	7.5	181	23.5	24.8	2.5	2.8	4	150
20 / 290	48.9	50.7	9.8	10.7	15	254	22.5	24.3	4.7	5.2	7.5	227
30 / 435	47.8	50.2	14.2	15.4	20	273	21.1	23.8	7.0	7.6	10	227
40 / 580	46.8	49.7	18.8	20.2	25	295	20.1	23.2	9.3	10.1	15	271
50 / 725	45.7	49.1	23.2	24.9	30	357	19.0	22.7	11.5	12.5	15	271
60 / 870	44.6	48.6	27.8	29.8	40	476	18.2	22.2	13.7	14.9	20	309
70 / 1015	43.9	48.1	32.2	34.5	40	476	17.2	21.7	16.0	17.3	20	309
80 / 1160	42.8	47.6	36.6	39.3	50	523	16.4	21.1	18.2	19.8	25	384
90 / 1305	42.0	47.3	41.2	44.0	50	523	15.3	20.6	20.5	22.3	25	384
100 / 1450	41.2	46.8	45.6	48.8	60	789	14.5	20.3	22.7	24.7	30	415
110 / 1595	40.4	46.5	50.2	53.5	60	789	–	–	–	–	–	–
120 / 1740	39.4	46.0	54.6	58.3	60	789	–	–	–	–	–	–

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

Viscosity > 90 SSU more power consumption.



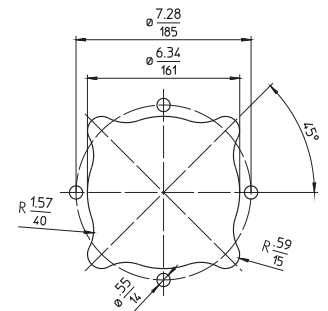
# Characteristics and dimensions

## TFS4, FFS4

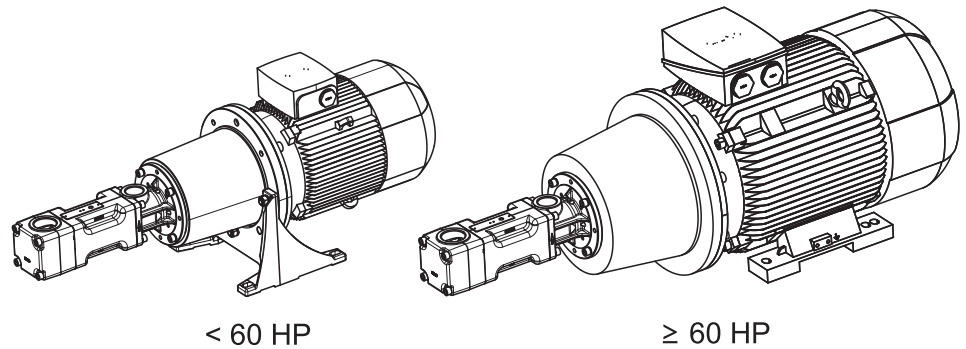
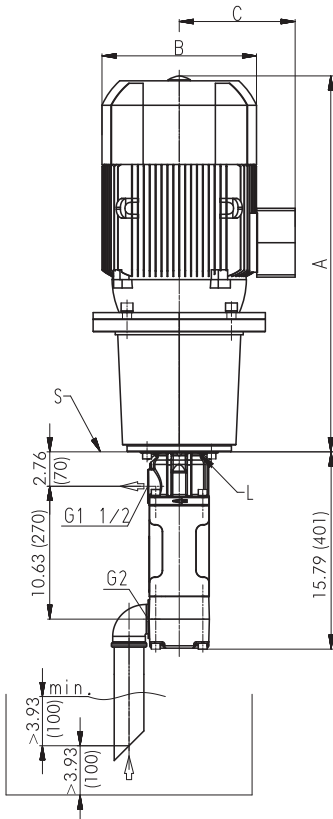
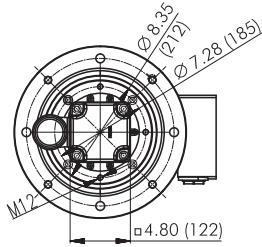
### 50 Hz

#### Mounting hole patterns

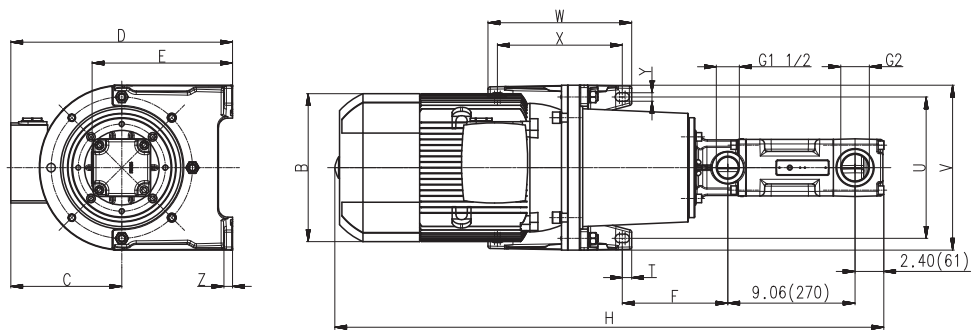
#### TFS3 / TFS4



Dimensions in Inches / mm  
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 HP	Power 4-poles HP	A	B	C	D	E	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
-	3 / 4	22.36	7.80	6.54	12.64	8.58	7.40	38.15	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5.4	5.4	21.69	8.74	6.97	13.07	8.58	7.40	37.48	0.89	8.46	9.84	9.06	7.28	0.55	0.59
10	7.5	25.94	10.31	7.95	15.24	9.76	7.83	41.73	0.89	10.43	11.81	10.63	8.86	0.55	0.71
7.5	-	23.98	10.31	7.95	15.24	9.76	7.83	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	10	26.30	10.31	7.95	15.24	9.76	7.83	42.09	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.08	12.36	9.33	18.58	11.73	8.82	45.87	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	20	32.44	12.36	9.33	18.58	11.73	8.82	48.23	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	25	32.60	14.02	11.26	20.51	11.73	8.82	48.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	-	32.44	14.02	11.26	20.51	11.73	8.82	48.23	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	30	33.78	14.02	11.26	20.51	11.73	8.82	49.57	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	-	34.68	15.59	12.40	22.64	12.72	8.43	50.47	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	-	35.67	15.59	12.40	22.64	12.72	8.43	51.46	0.98	13.78	15.75	13.78	11.81	0.71	0.79
60	-	38.74	17.68	13.31	22.17	11.34	19.49	54.53	0.98	14.02	17.17	14.21	12.24	0.75	1.34

# High Pressure Pumps



## TFS5, FFS5

50 Hz

### Screw spindles

Pressure max.	Flow at viscosity		Power consumption of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	2-pole motor rotation speed 2900 RPM		4-pole motor rotation speed 1450 RPM									
	5 SSU	90 SSU	5 SSU	90 SSU			5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS574/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 63.8</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 31.9</b>		–	–	–	–
10 / 145	60.8	62.1	6.7	7.6	10	271	28.8	30.1	3.1	3.6	5.4	218
20 / 290	59.7	61.6	12.2	13.3	20	333	27.7	29.6	5.8	6.4	7.5	287
30 / 435	58.7	61.0	17.6	19.0	25	355	26.7	29.1	8.4	9.4	10	287
40 / 580	57.9	60.5	22.9	24.7	30	417	25.9	28.8	11.3	12.2	15	331
50 / 725	57.1	60.2	28.3	30.3	40	536	25.1	28.3	13.9	15.2	20	368
60 / 870	56.3	59.7	33.8	36.1	40	536	24.3	27.7	16.6	18.0	20	368
70 / 1015	55.5	59.2	39.2	41.7	50	582	23.5	27.5	19.3	20.8	25	443
80 / 1160	54.7	58.9	44.5	47.5	50	582	22.7	26.9	22.0	23.7	25	443
90 / 1305	53.9	58.4	49.9	53.1	60	849	21.9	26.7	24.7	26.6	30	461
100 / 1450	53.4	58.1	55.4	58.7	60	849	21.1	26.2	27.5	29.4	40	571
110 / 1595	52.6	57.9	60.7	64.5	75	1014	–	–	–	–	–	–
120 / 1740	51.8	57.3	66.1	70.1	75	1014	–	–	–	–	–	–
<b>TFS5100/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 86.3</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 43.1</b>		–	–	–	–
10 / 145	81.9	84.0	8.6	9.5	15	313	38.8	41.0	4.0	4.7	7.5	287
20 / 290	80.8	83.5	16.0	17.3	20	333	37.8	40.2	7.6	8.6	10	287
30 / 435	79.8	82.7	23.2	24.9	30	417	36.7	39.6	11.4	12.5	15	331
40 / 580	78.7	82.2	30.6	32.7	40	536	35.7	39.1	15.0	16.4	20	368
50 / 725	77.7	81.6	37.8	40.5	50	582	34.6	38.6	18.6	20.2	25	443
60 / 870	76.9	81.1	45.2	48.3	60	849	33.6	38.0	22.3	24.1	25	443
70 / 1015	75.8	80.6	52.4	55.9	60	849	32.8	37.5	25.9	28.0	30	461
80 / 1160	75.0	80.1	59.7	63.7	75	1014	31.7	37.0	29.6	32.1	40	571
90 / 1305	74.0	79.8	67.1	71.5	75	1014	30.6	36.5	33.3	35.9	40	571
100 / 1450	73.2	79.3	74.3	79.3	100	1290	29.9	36.2	36.9	39.8	50	783
110 / 1595	72.1	79.0	81.7	86.9	100	1290	–	–	–	–	–	–
120 / 1740	71.3	78.5	88.9	94.7	100	1290	–	–	–	–	–	–

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

Viscosity > 90 SSU more power consumption.

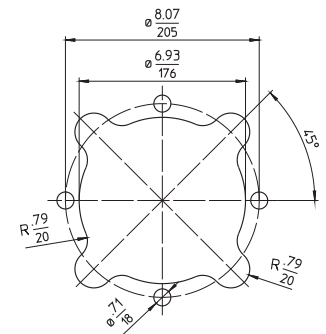
# Characteristics and dimensions

## TFS5, FFS5

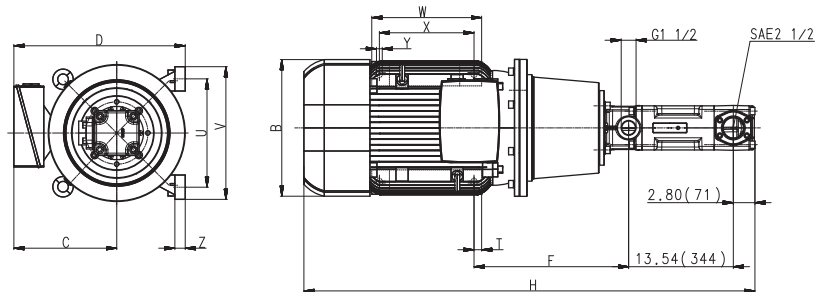
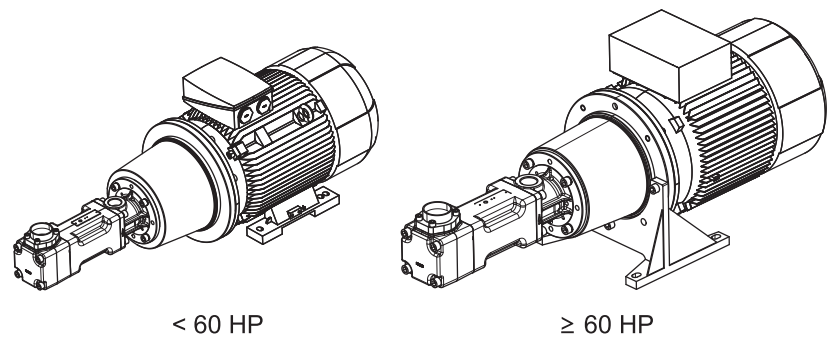
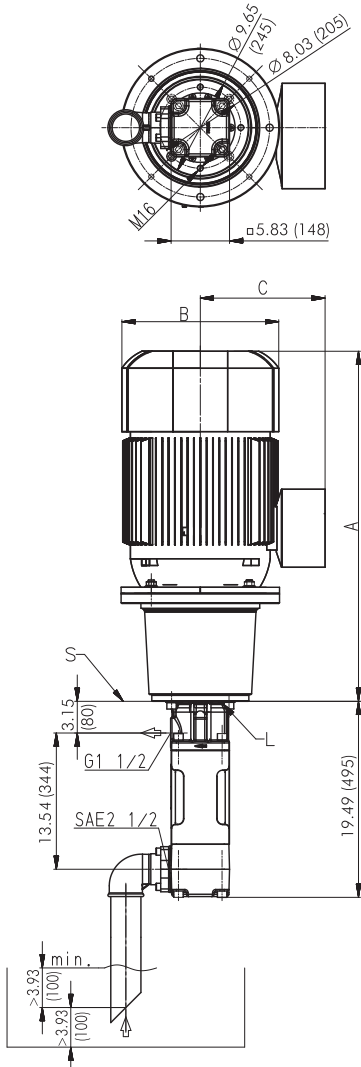
### 50 Hz

#### Mounting hole patterns

##### TFS5



Dimensions in Inches / mm  
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 HP	Power 4-poles HP	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
-	5.4	22.87	8.74	6.97	13.07	8.98	42.36	0.89	8.46	9.84	9.06	7.28	0.55	0.59
10	7.5	26.46	10.31	7.95	15.24	8.74	45.94	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	10	26.81	10.31	7.95	15.24	8.74	46.30	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.20	12.36	9.33	18.58	9.33	49.68	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	20	32.56	12.36	9.33	18.58	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	25	32.72	14.02	11.26	20.51	9.33	52.20	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	-	32.56	14.02	11.26	20.51	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	30	33.90	14.02	11.26	20.51	9.33	53.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	-	34.80	15.59	12.40	22.64	8.94	54.29	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	40	35.79	15.59	12.40	22.64	8.94	55.28	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	50	36.57	17.68	13.31	24.92	8.78	55.98	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	-	38.86	17.68	13.31	22.17	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
75	-	41.69	19.57	16.14	25.98	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
100	-	44.57	21.69	17.05	28.07	22.91	64.05	2.19	17.99	21.26	18.86	14.49	0.94	1.57

# High Pressure Pumps



## TFS5, FFS5

50 Hz

### Screw spindles

Pressure max.	Flow at viscosity		Power consumption of viscosity		Motor immersion version	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU			5 SSU	90 SSU	5 SSU	90 SSU		
	GPM	GPM	HP	HP			HP	Lbs	GPM	GPM		
Type / bar / PSI	Q <sub>Th</sub> <sup>1)</sup>						Q <sub>Th</sub> <sup>1)</sup>					
<b>TFS5120/</b>	<b>103.5</b>		-		-	-	<b>51.8</b>		-		-	-
10 / 145	98.3	100.9	10.1	11.7	15	313	46.5	49.1	4.8	5.5	7.5	287
20 / 290	96.7	100.1	18.9	20.9	25	355	45.2	48.3	9.1	10.2	15	331
30 / 435	95.4	99.3	27.6	30.2	40	536	43.6	47.6	13.5	14.9	20	368
40 / 580	93.8	98.5	36.3	39.6	50	582	42.3	46.8	18.0	19.6	25	443
50 / 725	92.5	97.8	45.2	48.8	60	849	40.7	46.2	22.3	24.3	30	461
60 / 870	91.1	97.2	53.9	58.1	60	849	39.4	45.4	26.7	29.0	30	461
70 / 1015	89.8	96.7	62.6	67.3	75	1014	38.0	44.9	31.1	33.7	40	571
80 / 1160	88.8	96.2	71.3	76.6	100	1290	37.0	44.4	35.4	38.4	40	571
90 / 1305	87.5	95.6	80.2	85.8	100	1290	35.4	43.9	39.8	43.0	50	783
100 / 1450	86.4	95.1	88.9	95.2	100	1290	34.1	43.3	44.3	47.7	50	783
110 / 1595	85.1	94.6	97.6	104.5	125	1466	-	-	-	-	-	-
120 / 1740	84.0	94.3	106.5	113.7	125	1466	-	-	-	-	-	-
<b>TFS5130/</b>	<b>112.2</b>		-		-	-	<b>56.1</b>		-		-	-
10 / 145	106.5	108.9	10.9	12.3	20	333	50.5	52.6	5.1	5.8	7.5	287
20 / 290	104.6	107.5	20.2	22.1	25	355	48.6	51.5	9.9	10.7	15	331
30 / 435	102.8	106.2	29.8	31.8	40	536	46.8	50.2	14.6	15.7	20	368
40 / 580	101.2	105.2	39.3	41.6	50	582	45.2	49.1	19.3	20.5	25	443
50 / 725	99.6	104.1	48.8	51.4	60	849	43.6	47.8	24.1	25.5	30	461
60 / 870	98.0	103.0	58.2	61.2	75	1014	42.0	46.8	28.8	30.4	40	571
70 / 1015	96.7	102.0	67.7	70.8	75	1014	40.7	46.0	33.7	35.4	40	571
80 / 1160	95.4	100.9	77.2	80.6	100	1290	39.4	44.9	38.4	40.2	50	783
90 / 1305	94.3	100.1	86.8	90.4	100	1290	37.8	43.9	43.0	45.2	50	783
100 / 1450	93.0	99.1	96.2	100.2	125	1466	36.5	43.1	47.9	50.2	60	860
110 / 1595	91.7	98.3	105.7	109.8	125	1466	-	-	-	-	-	-
120 / 1740	90.6	97.5	115.2	119.6	150	1819	-	-	-	-	-	-

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

Viscosity > 90 SSU more power consumption.

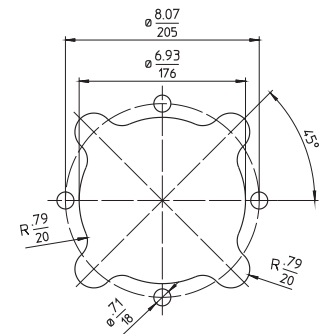
# Characteristics and dimensions

## TFS5, FFS5

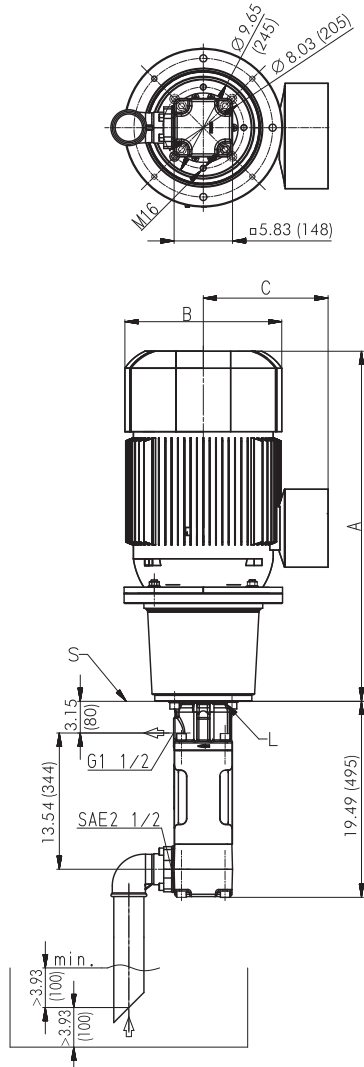
### 50 Hz

#### Mounting hole patterns

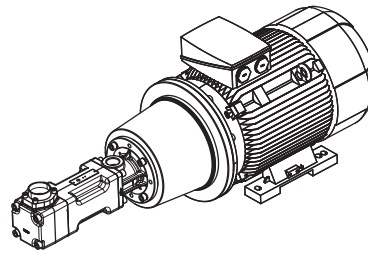
##### TFS5



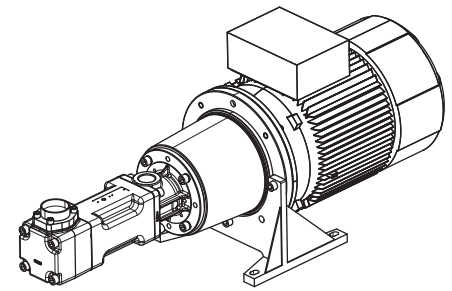
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



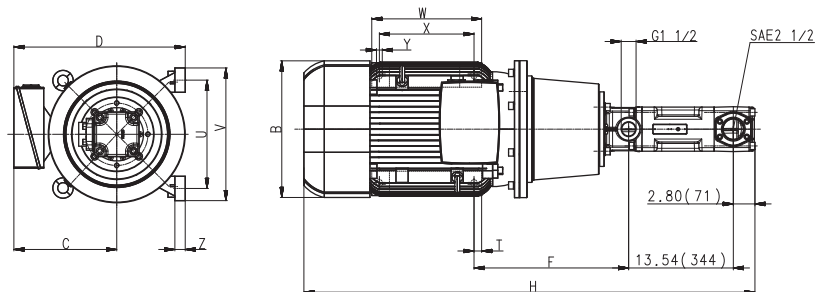
\*) Dimensions for 4-pole standard motor upon request  
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 60 HP



≥ 60 HP



Power 2-poles HP	Power 4-poles HP	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
–	7.5	26.46	10.31	7.95	15.24	8.74	45.94	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.20	12.36	9.33	18.58	9.33	49.68	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	20	32.56	12.36	9.33	18.58	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	25	32.72	14.02	11.26	20.51	9.33	52.20	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	30	33.90	14.02	11.26	20.51	9.33	53.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	–	34.80	15.59	12.40	22.64	8.94	54.29	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	40	35.79	15.59	12.40	22.64	8.94	55.28	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	50	36.57	17.68	13.31	24.92	8.78	55.98	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	60	38.86	17.68	13.31	22.17	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
75	–	41.69	19.57	16.14	25.98	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
100	–	44.57	21.69	17.05	28.07	22.91	64.05	2.19	17.99	21.26	18.86	14.49	0.94	1.57
125	–	48.94	21.69	17.05	28.07	22.91	68.43	1.18	17.99	21.26	18.86	16.50	0.94	1.57
150	–	48.78	24.25	20.28	32.68	24.53	68.27	1.38	20.00	24.02	20.75	15.98	1.10	1.97

# High Pressure Pumps



## TFS6, FFS6

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 of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU			5 SSU	90 SSU	5 SSU	90 SSU		
Type / bar / PSI	GPM	GPM	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs
<b>TFS690/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 121.3</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 60.8</b>		–	–	–	–
10 / 145	117.6	118.9	12.7	15.0	20	439	57.1	58.1	5.9	6.8	10	392
20 / 290	115.5	117.6	22.9	25.2	30	523	54.7	57.1	11.1	12.1	15	437
30 / 435	113.3	116.2	33.3	35.5	40	642	52.6	55.7	16.2	17.2	20	474
40 / 580	111.2	115.2	43.4	45.7	50	688	50.5	54.4	21.3	22.3	25	549
50 / 725	109.4	114.1	53.8	56.1	60	955	48.6	53.4	26.4	27.4	30	567
60 / 870	107.5	113.1	64.0	66.2	75	1120	46.8	52.3	31.6	32.6	40	677
70 / 1015	105.9	112.0	74.3	76.6	100	1396	45.2	51.3	36.7	37.7	40	677
80 / 1160	104.4	111.0	84.5	86.8	100	1396	43.6	50.2	41.8	42.8	50	889
<b>TFS6120/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 161.7</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 80.8</b>		–	–	–	–
10 / 145	156.9	158.5	16.1	18.4	25	461	76.1	77.7	7.6	8.6	10	392
20 / 290	154.3	156.9	29.8	32.1	40	642	73.4	76.1	14.5	15.4	20	474
30 / 435	151.7	155.3	43.4	45.7	50	688	70.8	74.5	21.3	22.3	25	549
40 / 580	149.3	154.0	57.1	59.4	75	1120	68.4	73.2	28.2	29.1	40	677
50 / 725	147.2	152.7	70.8	73.1	100	1396	66.3	71.9	35.0	35.9	40	677
60 / 870	145.0	151.4	84.5	86.8	100	1396	64.2	70.5	41.8	42.8	50	889
70 / 1015	143.2	150.1	98.2	100.4	125	1572	62.4	69.2	48.7	49.6	60	966
80 / 1160	140.8	148.7	111.8	114.1	125	1572	60.0	67.9	55.5	56.5	60	966
<b>TFS6145/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 195.5</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 97.8</b>		–	–	–	–
10 / 145	189.4	191.5	18.9	21.2	30	523	91.9	93.8	9.1	10.1	15	437
20 / 290	186.0	188.9	35.5	37.8	50	688	88.2	91.1	17.3	18.2	20	474
30 / 435	182.8	186.5	52.0	54.3	60	955	85.1	89.0	25.6	26.6	30	567
40 / 580	179.7	184.4	68.5	70.8	75	1120	81.9	86.7	33.9	34.9	40	677
50 / 725	176.7	182.6	85.0	87.3	100	1396	79.0	84.8	42.1	43.0	50	889
60 / 870	173.8	180.7	101.6	103.9	125	1572	76.1	83.0	50.4	51.4	60	966
70 / 1015	170.7	178.6	118.1	120.4	150	1923	72.9	80.8	58.7	59.7	75	1197
80 / 1160	167.8	176.5	134.6	136.9	150	1923	70.0	78.7	66.9	67.9	75	1197

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

Viscosity > 90 SSU more power consumption.

All 6 series screw pumps with an operating flow rate of 210 GPM / 800 l/min or above must be operated with a feed pump which supplies fluid with at least 14.5 psi / 1 bar of pressure to the pump inlet.

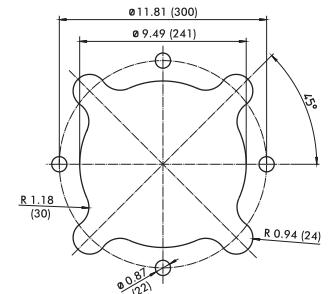
# Characteristics and dimensions

## TFS6, FFS6

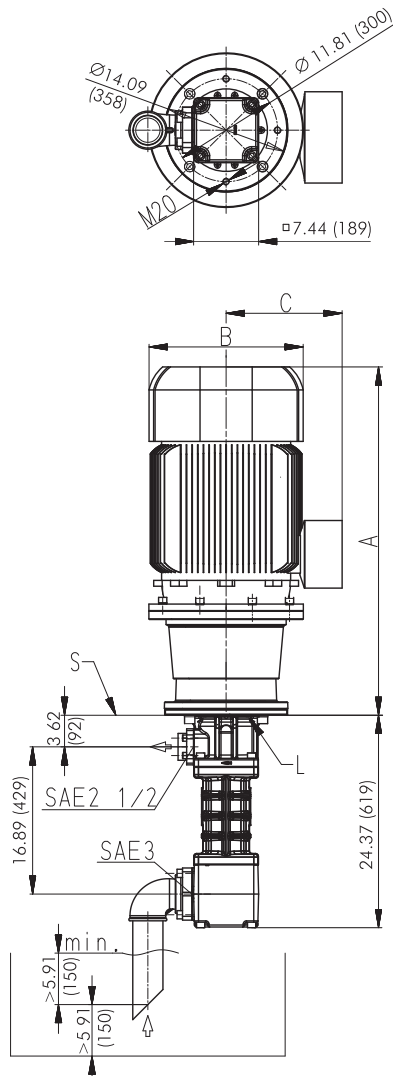
### 50 Hz

#### Mounting hole patterns

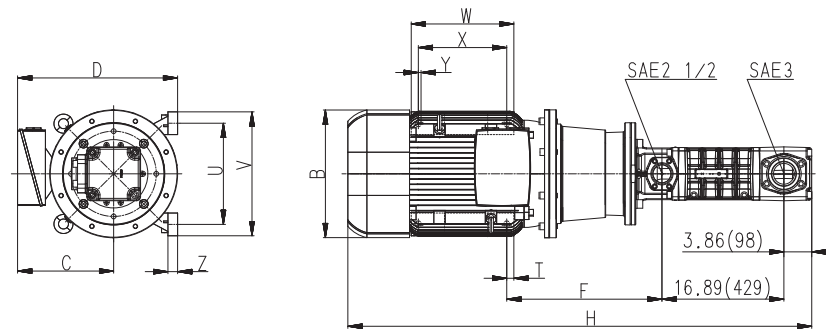
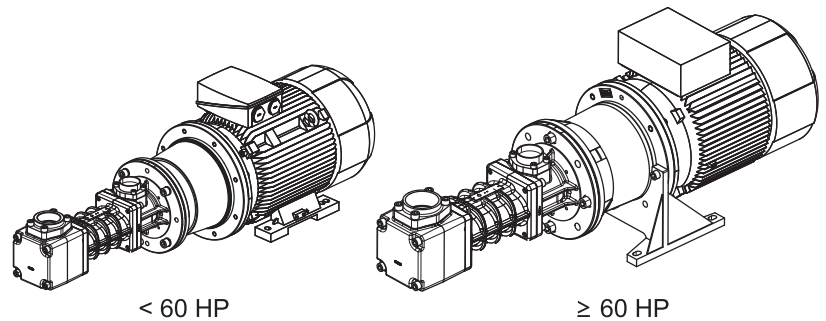
#### TFS6



Dimensions in Inches / mm  
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 HP	Power 4-poles HP	A	B	C	D	F	H	T	U	V	W	X	Y	Z
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch
-	10	28.46	10.31	7.95	15.24	9.53	52.83	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	15	31.30	12.36	9.33	18.58	9.53	55.67	0.79	11.81	13.78	12.01	10.43	0.71	0.71
20	-	31.30	12.36	9.33	19.57	9.53	55.67	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	20	33.66	12.36	9.33	18.58	10.43	58.03	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	-	33.66	12.36	9.33	19.57	9.53	58.03	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	25	33.82	14.02	11.26	20.51	10.43	58.19	0.79	11.81	13.78	12.01	10.43	0.71	0.71
30	-	33.66	14.02	11.26	21.50	9.53	58.03	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	30	35.00	14.02	11.26	20.51	15.63	59.37	0.79	11.81	13.78	12.01	10.43	0.71	0.71
40	-	35.83	15.59	12.40	22.64	10.43	60.20	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	40	36.81	15.59	12.40	22.64	16.42	61.18	0.98	13.78	15.75	13.78	11.81	0.71	0.79
50	-	36.81	15.59	12.40	22.64	10.43	61.18	0.98	13.78	15.75	13.78	11.81	0.71	0.79
-	50	38.31	17.68	13.31	24.92	17.01	62.68	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	60	39.88	17.68	13.31	22.17	21.50	64.25	0.98	14.02	17.17	14.21	12.24	0.75	1.34
75	-	42.20	19.57	16.14	25.98	23.03	66.57	1.18	15.98	19.29	16.10	13.74	0.94	1.57
100	-	45.67	21.69	17.05	28.07	24.49	70.04	2.19	17.99	21.26	18.86	14.49	0.94	1.57
125	-	50.00	21.69	17.05	28.07	24.49	74.37	1.18	17.99	21.26	18.86	16.50	0.94	1.57
150	-	48.90	24.25	20.28	32.68	25.12	73.27	2.38	20.00	24.02	20.75	15.98	1.10	1.97



## Valves

### Adjustable Pressure Relief Valves

Adjustable pressure relief valves allow for variable operating pressures anywhere between 75 – 1740 PSI (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.

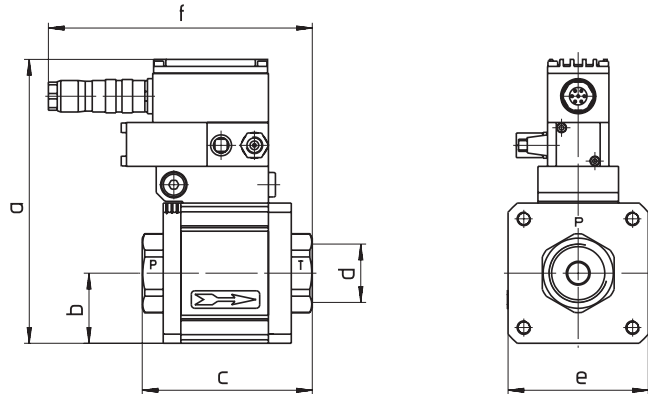
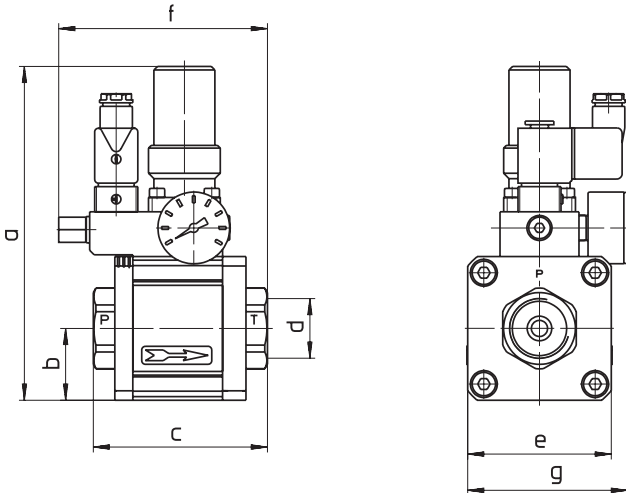
The system user must ensure that the operating pressure never exceeds the highest allowable operating pressure (i.e. by using a second non adjustable pressure relief valve which is set for the highest allowable pressure).

#### 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 / PSI	Flow Qmax GPM / l/min
3-HPB-08	10-200 / 145-2900	4.8 / 18
3-HPB-S 15	5-64 / 72-930	26.5 / 100
3-HPB-H 15	5-120 / 72-1740	26.5 / 100
3-HPB-S 32	5-64 / 72-930	106 / 400
3-HPB-H 32	5-120 / 72-1740	63.5 / 240
3-HPB-S 50	5-64 / 72-930	212 / 800

Type	Pressure p bar / PSI	Flow Qmax GPM / l/min
SPB-08	10-200 / 145-2900	4.8 / 18
SPB-S 15	5-64 / 72-930	26.5 / 100
SPB-H 15	5-120 / 72-1740	26.5 / 100
SPB-S 32	5-64 / 72-930	106 / 400
SPB-H 32	5-120 / 72-1740	63.5 / 240
SPB-S 50	5-64 / 72-930	212 / 800

Type 3-HPB	a Inch	b Inch	c Inch	d Inch	e Inch	f Inch	g Inch
08	7.09	1.46	5.43	G <sup>3</sup> / <sub>8</sub>	∅ 2.91	-	-
S / H 15	7.32	1.57	3.82	G1	∅ 3.15	4.58	3.50
S / H 32	9.10	2.36	6.30	G1 <sup>1</sup> / <sub>2</sub>	∅ 4.72	4.92	4.29
S 50	9.88	2.76	6.30	G1 <sup>1</sup> / <sub>2</sub>	∅ 5.51	-	-

Type SPB	a Inch	b Inch	c Inch	d Inch	e Inch	f Inch
08	5.95	1.46	5.43	G <sup>3</sup> / <sub>8</sub>	∅ 2.91	-
S / H 15	6.38	1.57	3.82	G1	∅ 3.15	5.93
S / H 32	7.58	2.36	6.30	G1 <sup>1</sup> / <sub>2</sub>	∅ 4.72	6.95
S 50	9.88	2.76	6.30	G1 <sup>1</sup> / <sub>2</sub>	∅ 5.51	-

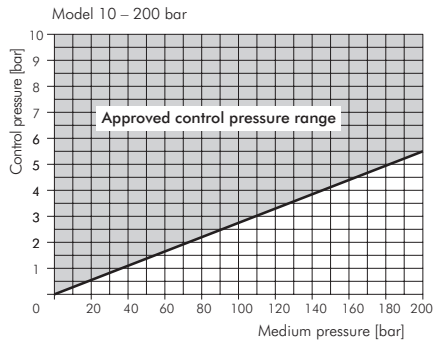
Further valves on request.



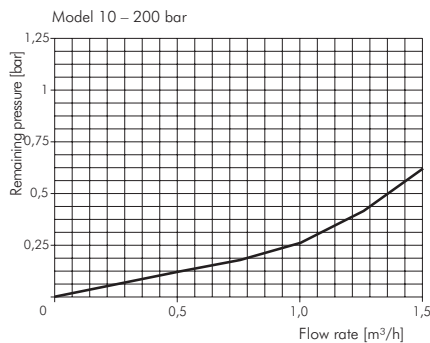
## Valves

### 3-HPB – 08 | SPB – 08

Control pressure diagram

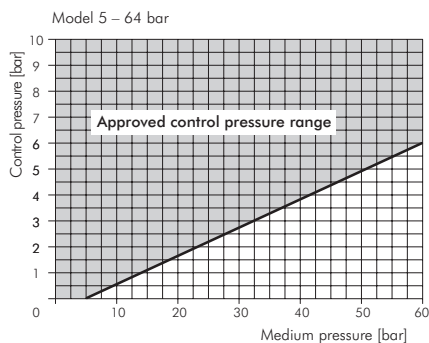


Depressurized recirculation mode

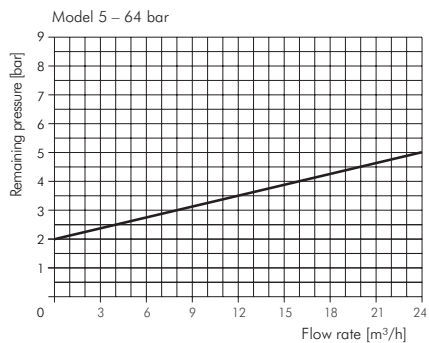


### 3 – HPB – S 32 | SPB – S 32

Control pressure diagram

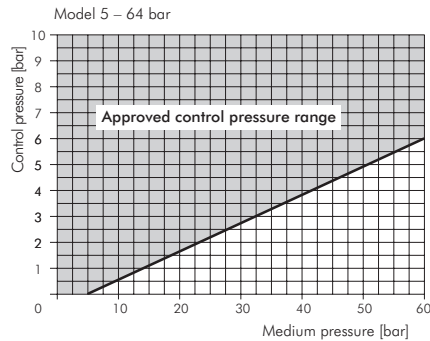


Depressurized recirculation mode

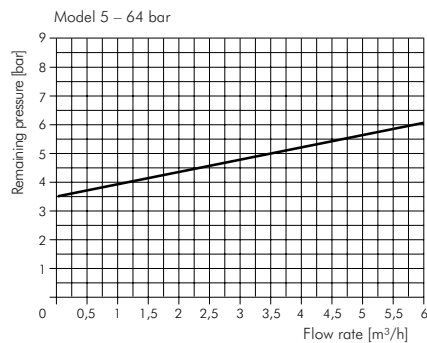


### 3 – HPB – S 15 | SPB – S 15

Control pressure diagram

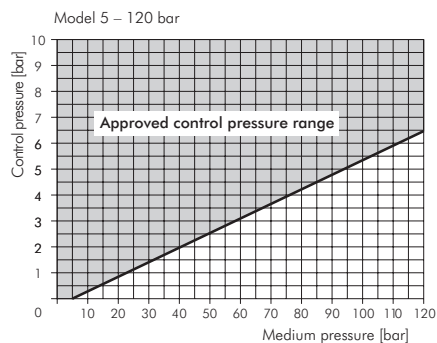


Depressurized recirculation mode

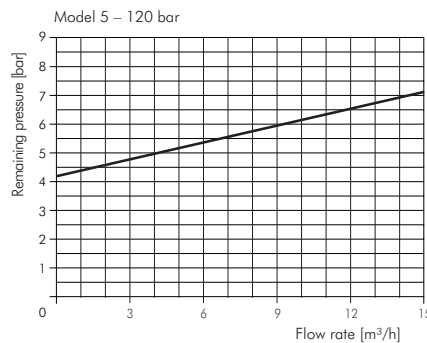


### 3 – HPB – H 32 | SPB – H 32

Control pressure diagram

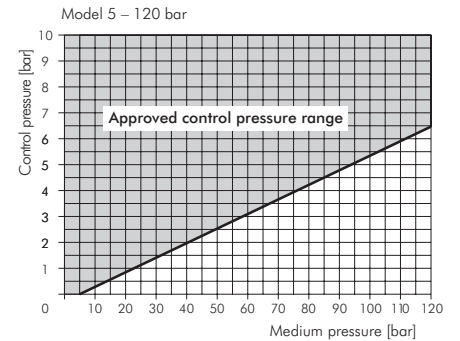


Depressurized recirculation mode

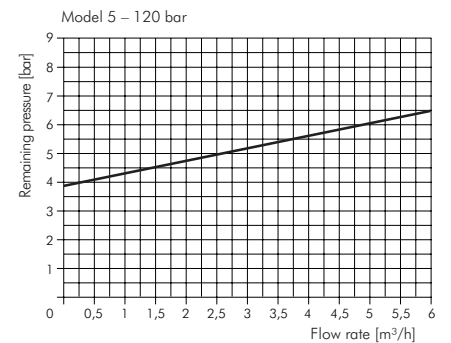


### 3 – HPB – H 15 | SPB – H 15

Control pressure diagram

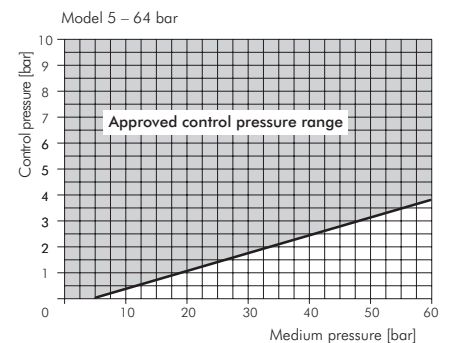


Depressurized recirculation mode

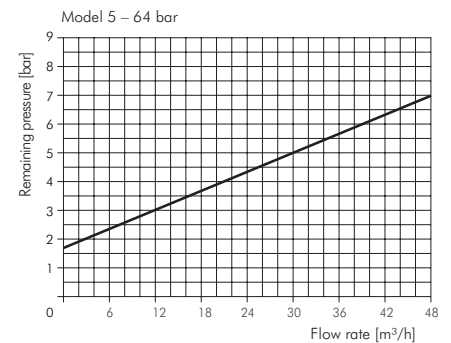


### 3 – HPB – S 50 | SPB – S 50

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 dampens against vibration is recommended. BBV / HBV series are such relief valves. They are available in 145 PSI (10 bar) increments and are preset by the factory for the highest allowable operating pressure for the specific pump and motor combination.

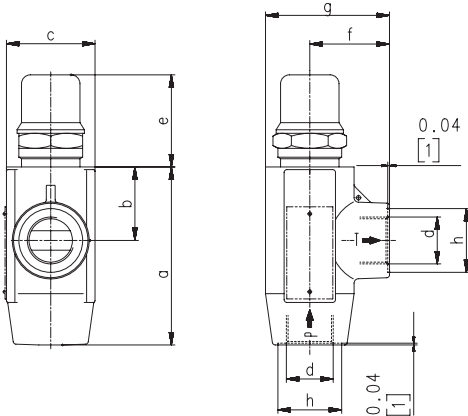
### Non-adjustable Pressure Relief Valves BBV / HBV

Non-adjustable Pressure Relief valves of the series BBV and HBV are shock absorbent valves which open at a preset pressure. The relief valve opens at the factory set pressure which is available in 145 PSI (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 / PSI)														
		10/ 145	20/ 290	30/ 435	40/ 580	50/ 725	60/ 870	70/ 1015	80/ 1160	90/ 1305	100/ 1450	110/ 1595	120/ 1740	130/ 1885	140/ 2030	150/ 2175
BFS1, FFS1 BFS232, FFS232	BBV1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BFS2, FFS2	BBV2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BFS1-H, BFS2-H	HBV2	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—
TFS2, FFS3	BBV3	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TFS3-H	HBV3	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—

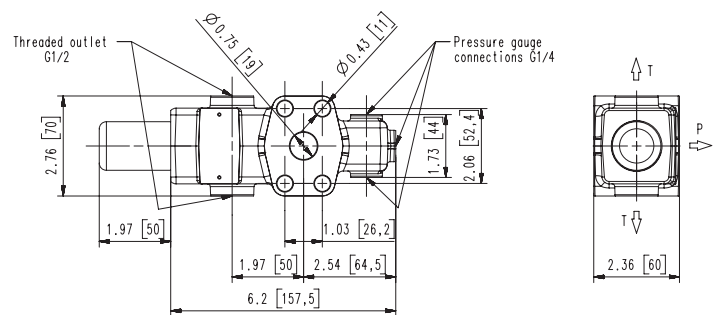
Ordering description: e.g. BBV 3 / 50

### BBV

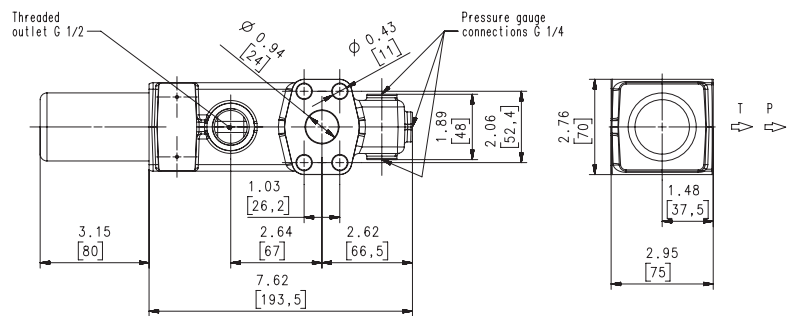


	BBV 1 + 2 Inch	BBV 3 Inch
a	3.96	5.12
b	1.63	2.09
c	1.97	2.56
d	G 3/4	G1
e	2.05	3.19
f	1.77	1.93
g	2.76	3.21
h	1.42	1.65

### HBV 1+2



### HBV 3



Dimensions in Inches / mm

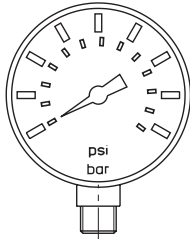
Additional relief valve characteristics upon request. The actual opening pressure may deviate from the nominal pressure setting of the valve because of the tension of the loaded spring rate.

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

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

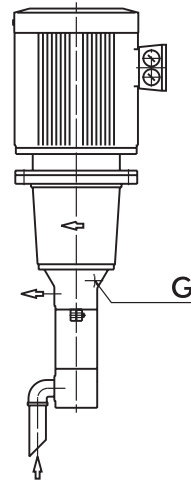
## Pressure gauge / Suction protection G4 Version

### Pressure gauge



Type	Pressure p bar / PSI
M 60	0 – 60 / 0 – 870
M 100	0 – 100 / 0 – 1450
M 160	0 – 160 / 0 – 2320

### G4 Version

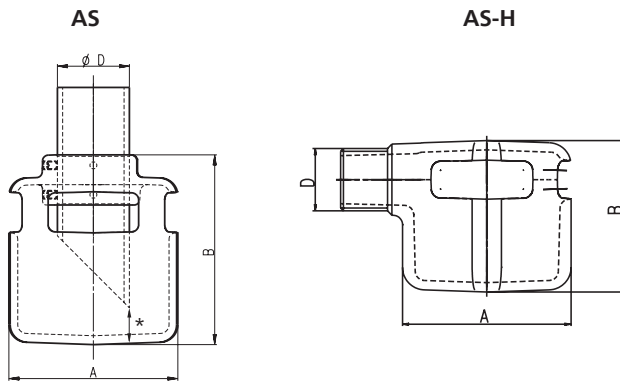


G1/8 BFS/FFS 1, 2  
G1/4 TFS/FFS 3, 4, 5

Depressurized leakage return to tank

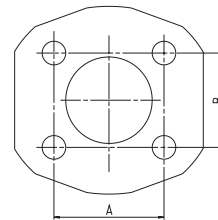
### Suction protection

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



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

### SAE flange

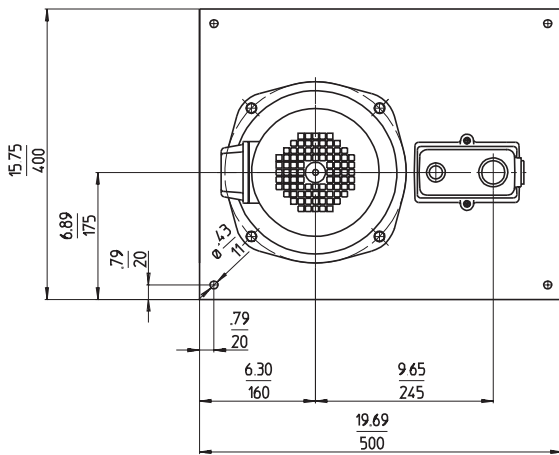
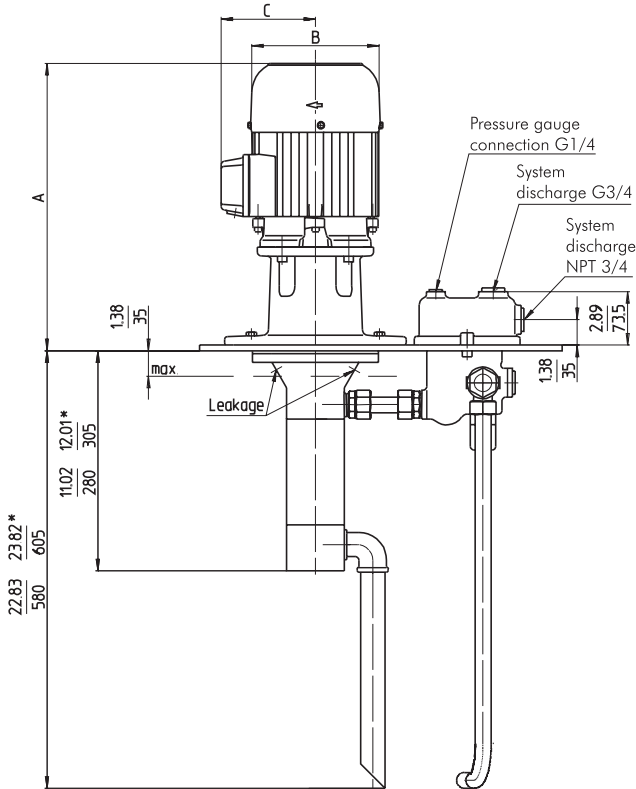


Type	Type of Pumps	A Inch	B Inch	Ø D
AS1-2	BFS1, BFS2	3.54	3.70	1"
AS3	TFS3	4.53	5.08	1½"
AS4	TFS4	5.91	6.89	2"
AS5	TFS5	7.68	7.48	2½"
AS1-2-H	BFS1, BFS2	3.54	3.15	1"
AS3H	TFS3	4.53	4.53	G1½
AS4H	TFS4	6.02	6.89	G2
AS5H	TFS5	7.64	7.48	G2½

Type	Type of Pumps	A Inch	B Inch
SAE 2 ½	TFSS, FFS5	3.50	2.00
SAE 3	TFS6, FFS6	4.75	2.75

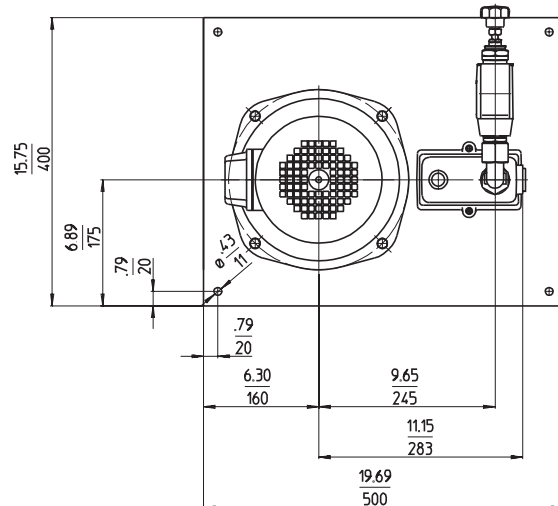
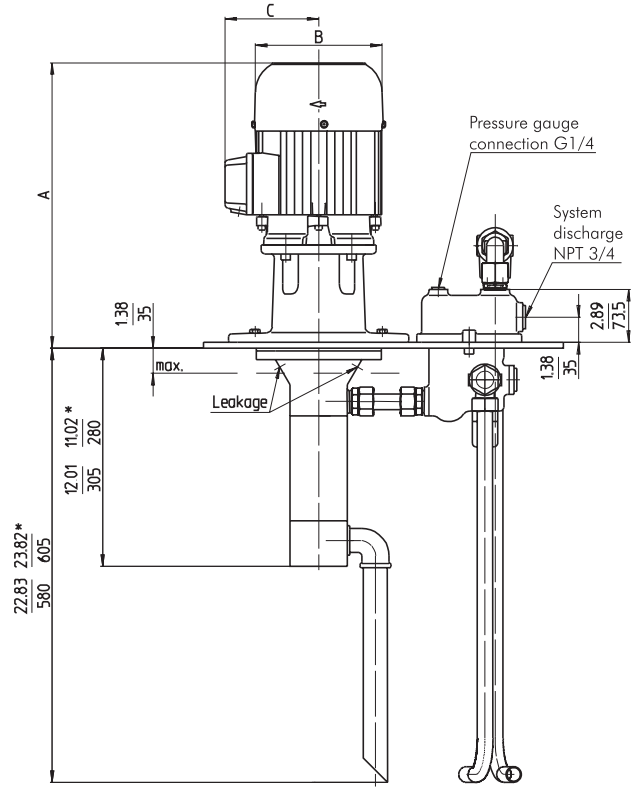
## Pump system, fully assembled

- 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.



Dimensions in Inches / mm

- 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.



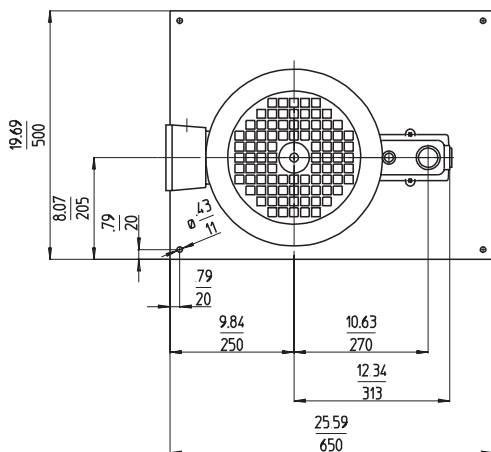
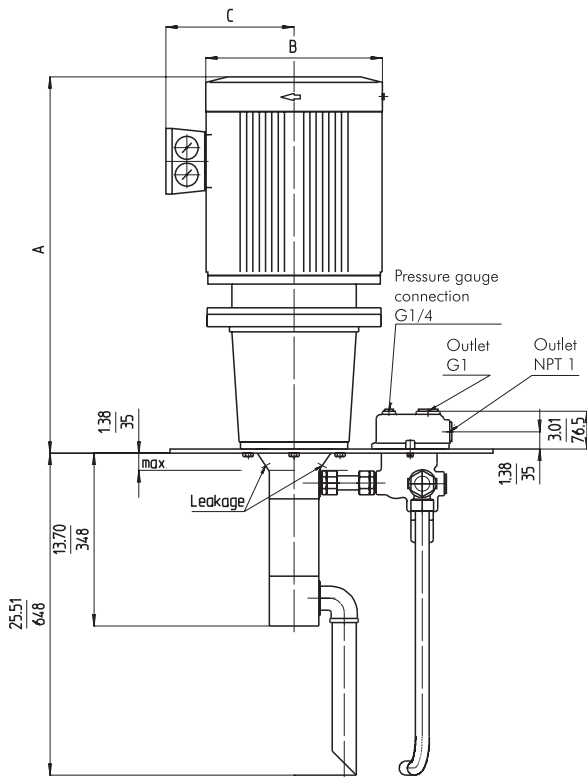
Dimensions in Inches / mm

\*) Dimensions for BFS2  
Dimensions A + 0.31 Inch (8 mm) mounting plate

\*) Dimensions for BFS2  
Dimensions A + 0.31 Inch (8 mm) mounting plate

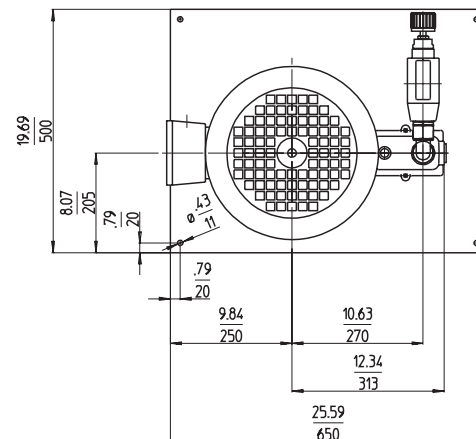
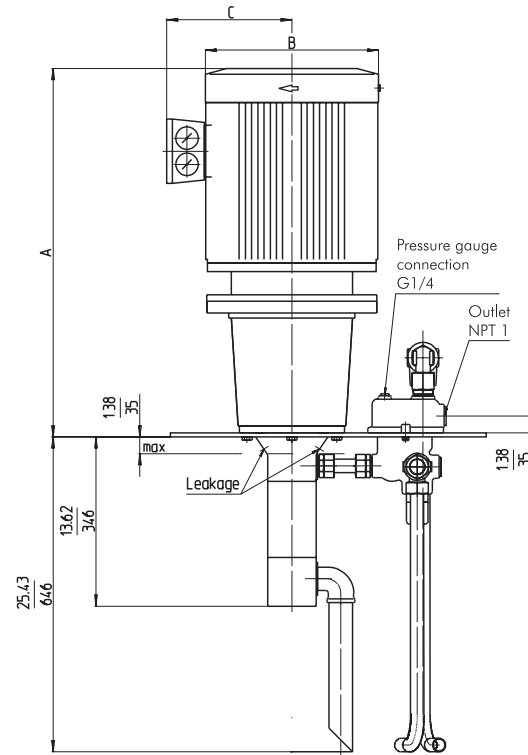
## Pump system, fully assembled

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



Dimensions in Inches / mm

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



Dimensions in Inches / mm

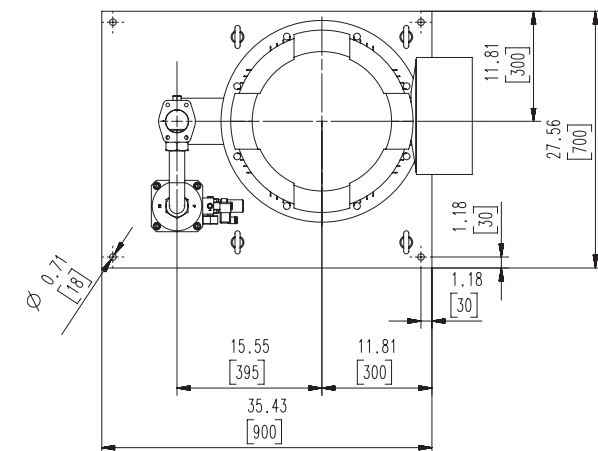
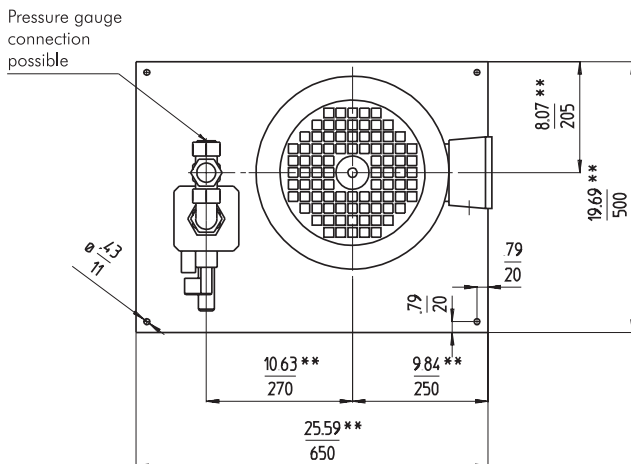
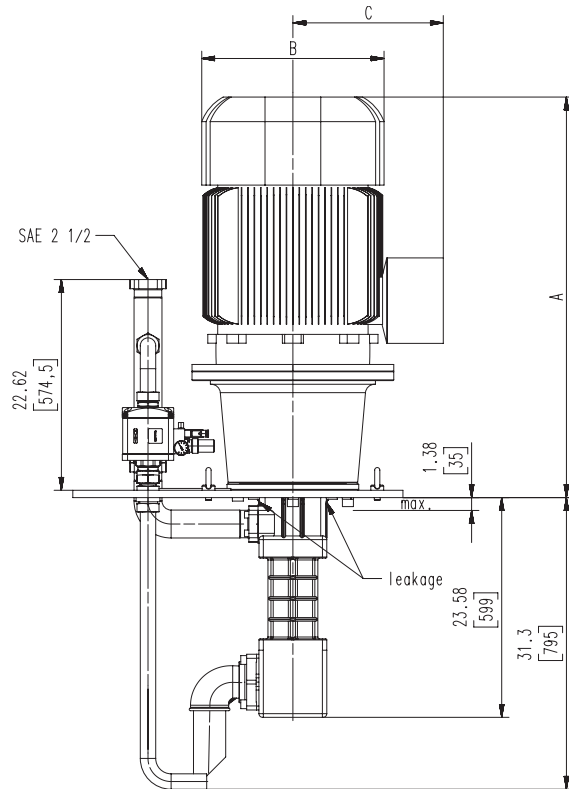
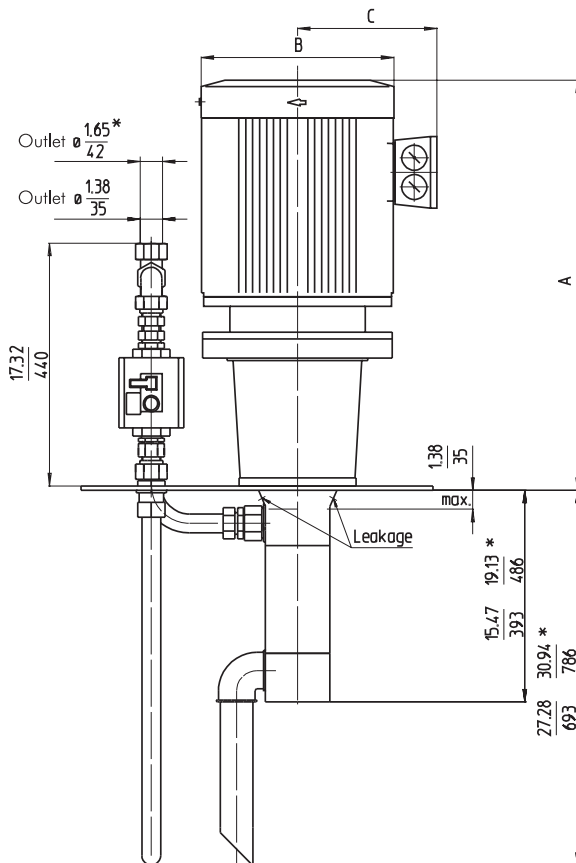
Dimensions A + 0.31 Inch (8 mm) mounting plate

Dimensions A + 0.31 Inch (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.

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 in Inches / mm

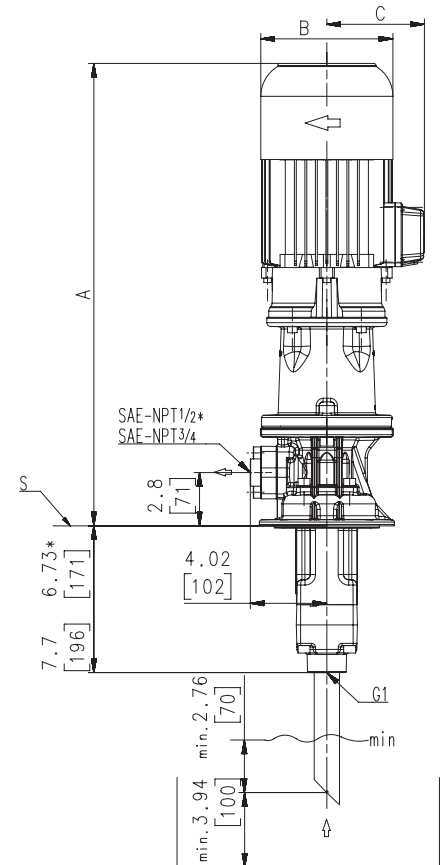
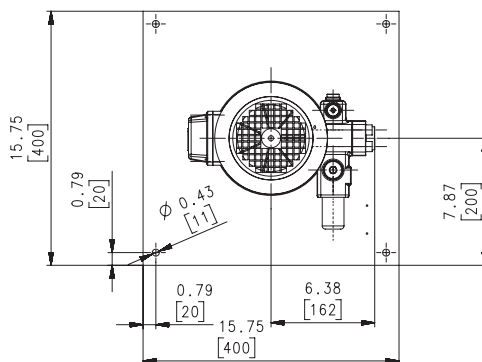
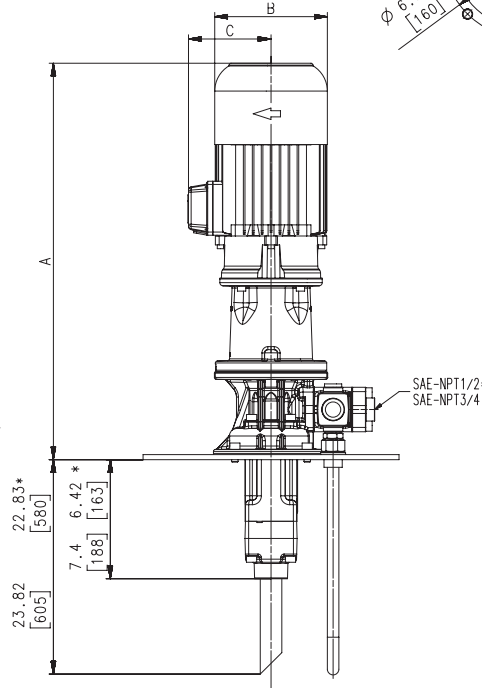
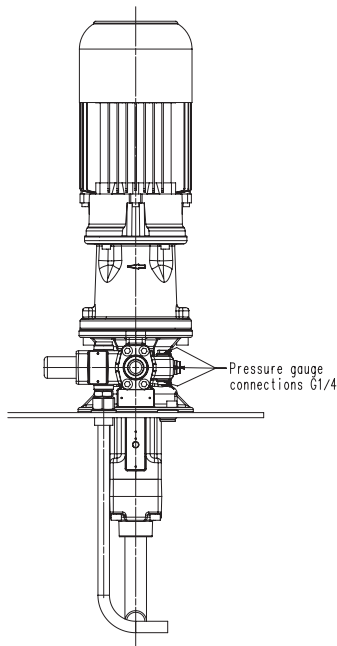
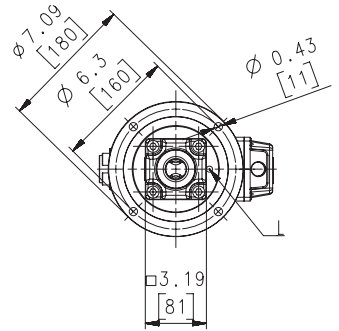
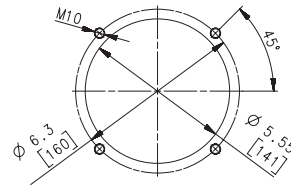
Dimensions in Inches / mm

\*) Dimensions for TFS5  
\*\*) Dimensions for motors larger than 50 HP (37 kW) upon request  
Dimensions A + 10.47 Inch (12 mm) mounting plate

## Pump system, fully assembled

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

### Mounting hole patterns



\* = BFS1-H  
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole

Dimensions for standard motor upon request

Dimensions in Inches / mm

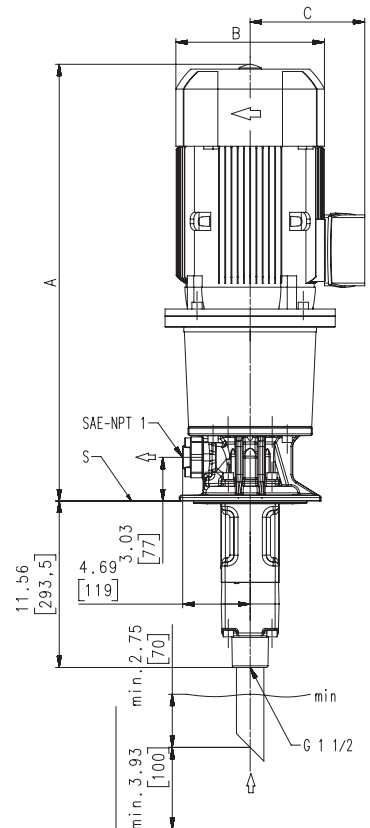
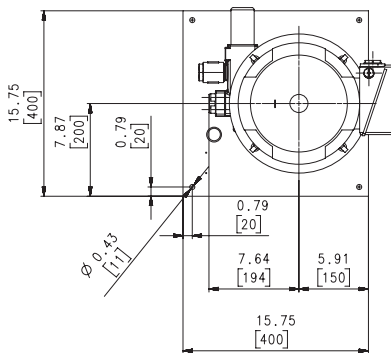
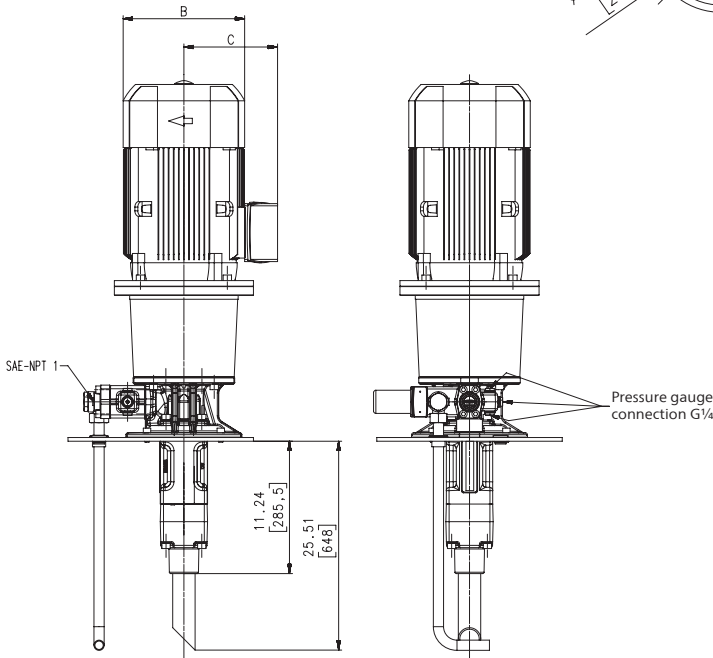
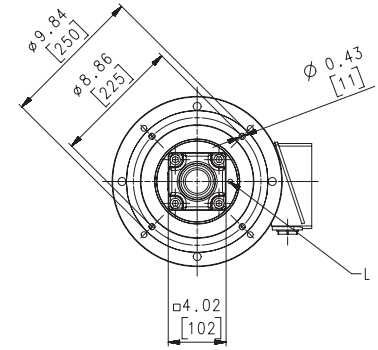
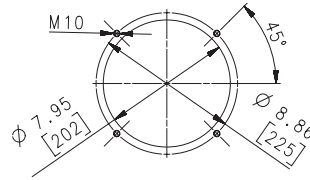
Power Supply 60 Hz 2-poles HP	BFS1-H			BFS2-H		
	A Inch	B Inch	C Inch	A Inch	B Inch	C Inch
B 2.0 / 2.3	21.97	6.93	5.12	21.97	6.93	5.12
B 2.9 / 3.4 / 3.9	24.29	6.93	5.12	24.29	6.93	5.12
B 4.6 / 5.1 / 6.1	25.83	8.58	5.91	25.83	8.58	5.91
B 7.7 / 8.4	27.01	8.58	5.91	27.01	8.58	5.91
B 11.5	30.12	10.16	7.60	30.12	10.16	7.60
B 13.8				30.12	10.16	7.60
B 16.9 / 20.1				30.43	12.20	9.45

Power Supply 50 Hz 2-poles HP	BFS1-H			BFS2-H		
	A Inch	B Inch	C Inch	A Inch	B Inch	C Inch
B 1.7 / 2.0	21.97	6.93	5.12	21.97	6.93	5.12
B 2.3	22.99	6.93	5.12	22.99	6.93	5.12
B 2.5 / 2.9 / 3.5	24.29	6.93	5.12	24.29	6.93	5.12
B 4.4 / 5.4	25.83	8.58	5.91	25.83	8.58	5.91
B 6.7 / 7.4	27.01	8.58	5.91	27.01	8.58	5.91
B 10.1	30.12	10.16	7.60	30.12	10.16	7.60
B 12.1				30.12	10.16	7.60
B 14.7 / 17.4				30.43	12.20	9.45

## Pump system, fully assembled

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

### Mounting hole patterns



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

Dimensions in Inches / mm

Power 60 Hz 2-poles HP	TFS3-H		
	A Inch	B Inch	C Inch
4	27.52	7.80	6.54
5	26.85	8.74	6.97
7.5	28.59	10.31	7.95
10	30.55	10.31	7.95
15 / 20	35.24	12.36	9.33
25	37.60	12.36	9.33
30	37.60	14.02	11.26
40	39.84	15.59	12.40
50	40.83	15.59	12.40

Power 50 Hz 2-poles HP	TFS3-H		
	A Inch	B Inch	C Inch
3	25.47	7.01	4.96
4	27.52	7.80	6.54
5.4	26.85	8.74	6.97
7.5	28.59	10.31	7.95
10	30.55	10.31	7.95
15 / 20	35.24	12.36	9.33
25	37.60	12.36	9.33
30	37.60	14.02	11.26
40	39.84	15.59	12.40



# Brinkmann Pumps Inc.

## Terms and Conditions

The following terms and conditions govern all quotations made by Brinkmann Pumps Inc. („Brinkmann“) and any orders based upon these quotations. No contract term or condition shall be amended, deleted or added without the express written consent of Brinkmann, and Brinkmann hereby rejects any terms set forth in any other writing which are in addition to or different from the terms in this quotation.

These items and conditions and any other terms and conditions delivered in writing by an authorized agent of Brinkmann contemporaneously herewith constitute the complete agreement between Brinkmann and the buyer and supersede all prior oral, written or printed statements of any kind (including any terms and conditions submitted by the buyer and performance or production data from any source whatsoever, including references to accuracy, capacity, and capability of products, all of which are estimates only) made by Brinkmann or the buyer or their respective representatives. No statement, recommendation or assistance given by Brinkmann or its representatives to buyer or its representatives, in connection with the use of any products by buyer, shall constitute a waiver by Brinkmann of any of the provisions hereof or affect Brinkmann's liability, as defined herein. All transactions covered hereby and all terms and conditions of sale shall be governed by the laws of the state of Michigan.

### Prices

The products offered in this proposal and the prices quoted are based on our understanding of buyer's requirements; any change in requirements will necessitate a revision in prices quoted. Prices are F.O.B. our dock, Wixom, Michigan, or other location as specified on proposal. Brinkmann's prices do not include sales, use, excise, or similar tax, applicable to the sale or use of the equipment proposed. These taxes shall be paid by the buyer, or in lieu thereof, the buyer shall provide Brinkmann with a tax exemption certificate acceptable to the taxing authorities.

### Delays or failure to deliver

Brinkmann shall not be responsible for delay or failure to deliver due to acts of God, or to government action (civil or military), or to prior orders, or to fire, embargo, strike or other labor problems, wrecks, delays in transportation, unusually severe weather or inability to obtain necessary labor or materials from the usual source of supply, or any other circumstances beyond Brinkmann's control.

Brinkmann shall have the right to furnish suitable substitutes for materials which cannot be obtained because of such force majeure.

### Installation

Buyer shall install at its own expense, all products covered hereby in accordance with the operating instructions to be furnished to buyer upon request. Unless otherwise stated, no installation services are included in the price indicated.

### Limited warranty

Brinkmann warrants to the buyer (but not to any others) for a period of one year from date of shipment that all new parts are free from defects in material and workmanship. Brinkmann's said warranty shall exist only if buyer gives written notice to Brinkmann within ten days after the first determination that the part is defective and within the aforesaid one year period from the date of shipment and includes in said notice consent to Brinkmann to inspect, at any reasonable time, said part and the machine in which it may be embodied, and if, and only if, Brinkmann determines to its reasonable satisfaction upon said inspection that said part and the machine in which it may be embodied are, and have been, used in accordance with all Brinkmann's instructions as to maintenance and operation set forth in the operating instructions relating to the machine. Brinkmann's warranty is limited to shipping to buyer replacement of any part which is so proven to be defective and in any event shall have **no liability whatsoever for incidental or consequential damage or loss of profit**, including damages resulting from personal injury or death, or damage to, or loss of use of, any property. Brinkmann is not responsible for shipping costs or labor, extends no warranty of any kind for gasket, seals and wear and tear materials. Notwithstanding any provisions of these terms and conditions, **this warranty is the only warranty extended by Brinkmann in connection with any sales of products and is in lieu of all other warranties, express or implied, including warranties of merchantability or fitness for purpose.** No agent, employee or representative of Brinkmann has any authority to bind Brinkmann to any affirmation, representation, or warranty concerning the products that are the subject of this quotation beyond that specifically included in the written quotation. Brinkmann shall have no obligation to install or provide improvements or changes in design adapted by Brinkmann for similar equipment subsequent to acceptance of buyer's order.

**Warranties have been discussed and understood by both parties.**

### Buyer's use and O.S.H.A.

Buyer shall use and require all persons operating the equipment to use all proper and safe operating procedures set forth in operating instructions relating to the equipment and observe all occupational safety health and standards act (O.S.H.A.), American National Standard Institute (ANSI), and state regulations as required and all available, feasible and practical point of operation safety devices consistent with buyer's use of the equipment. Buyer shall not remove or modify, any device, warning sign, operating instructions or work handling tools installed on or attached to the equipment. Buyer shall notify Brinkmann promptly, in writing, and in all events within ten (10) days after its occurrence, of any accident or malfunction involving any equipment which results in injury to or death of persons or damage to property, or the loss of use thereof and buyer shall cooperate fully with Brinkmann in investigation and determining the cause of any such occurrence of malfunction. At Brinkmann's request made at any time, buyer will either at its or Brinkmann's place of business, permit to redesign, remodel or revise the equipment and buyer waives any claims against Brinkmann for buyer's inability to use the equipment during the time that same is out of service for such revision, modification or redesign.

Brinkmann shall not be responsible for any failure to comply which results from the location, operation, design, use or maintenance of the equipment from alternation of the equipment by persons or firms other than Brinkmann, or from an option or accessory to the equipment by persons or firms other than Brinkmann, which was available to the buyer but omitted at the buyer's direction, or from design or instructions furnished by the buyer or its agents. In view of the above, Brinkmann does not make any warranties with respect to O.S.H.A. requirements, including noise; and will not be responsible for fines, penalties, or consequential damages.

### Payment terms

Net payment in full of all invoices is due thirty (30) days net, unless stated otherwise in quotation. Any unpaid balance thereafter shall be subject to a service charge of 1.75 % per month or, if illegal, at the highest rate allowed by law. There shall be no extension or change in the time for payment due to delay in instal-

# Brinkmann Pumps Inc.

## Terms and Conditions



lation and/or delays in operation of the equipment caused by damage, warranty service or warranty replacement of parts. If after Brinkmann's acceptance of buyer's purchase order, buyer requests Brinkmann to delay shipment of the equipment, the purchase price shall become due and owing thirty (30) days after the equipment is ready for shipment.

If buyer fails to pay the purchase price as provided herein and Brinkmann institutes a lawsuit for the collection of said price, buyer agrees to pay Brinkmann's reasonable attorney fees incurred in connection therewith.

### Acceptance of orders

Quotations are offered for written acceptance within thirty (30) days from date (unless otherwise stated) but are subject to change without notice at any time before acceptance. If any order contains printed, stamped or other provisions inconsistent or in conflict with the terms and conditions hereof, the terms and conditions hereof shall control, unless otherwise specifically stated by Brinkmann in writing. All clerical errors are subject to correction in favor of either party upon notice of either party. All orders are subject to the credit approval of Brinkmann. An order containing subject matter not within the contemplation of the proposal shall be subject to a further quotation as to price or delivery or both. Modifications, changes, deferred shipments, cancellations or additions will be effective only if accepted by Brinkmann in writing and then only upon terms that will indemnify Brinkmann against all costs and losses.

### Title and security agreement

Delivery to carrier shall constitute transfer to the buyer, and all risk of loss or damage in transit shall be borne by the buyer.

By execution of a purchase order, buyer hereby grants to Brinkmann a security interest in the equipment covered by the proposal, and its products and/or proceeds in order to secure the payment of the purchase price thereof and buyer authorizes to file financing statements reflecting this security interest without buyer's signature. Buyer will cooperate with Brinkmann in preparing documents necessary to perfect this security interest.

### Proprietary and other materials

This quotation and all drawings, specifications, materials, patterns, and special purpose manufacturing aids which are supplied to buyer by Brinkmann shall be kept in confidence and shall be listed and maintained in suitable con-

dition at the expense of buyer and are to be considered the property of Brinkmann held on consignment by buyer and to be insured while in buyer's possession. Such articles and all copies thereof from any source shall be returned to Brinkmann at any time upon request and shall not be used for or by any third parties without the express written permission of Brinkmann.

### Performance in event of default

In addition to the rights and remedies conferred upon Brinkmann by law, Brinkmann will not be required to proceed with the performance of any order or contract if buyer is in default in the performance of any order or contract with Brinkmann and in case of doubt as to buyer's financial condition, shipments under an order may be suspended or sent sight draft with bill of lading attached and Brinkmann may decline further shipments except for cash before shipment.

### Hold harmless/indemnity

Except to the extent of the limited warranty set forth above and Brinkmann's own gross negligence or willful misconduct, buyer hereby: (1) waives, releases and discharges any and all claims of any and every kind (including but not limited to injury or death of any person or damage to property), which it may have at any time against Brinkmann, its agents or employees, by reason of or arising out of any claimed improper design, specification or manufacture of the equipment sold hereunder, or of any claimed inadequate or insufficient safeguards or safety devices; and (2) covenants to indemnify and hold harmless Brinkmann, its agents and employees of, from and against any and all loss, damage, expense (including attorney's fees), claims, suits or liability which Brinkmann or any of its employees may sustain or incur at any time for or by reason of any injury or death of any person or persons or damage to any property, arising out of any claimed improper design or manufacture of the equipment sold hereunder, or of any claimed inadequate or insufficient safeguards or safety devices.

### Electrical equipment

Motors, electrical equipment and wiring on the equipment quoted will be supplied in accordance with the manufacturer's standards. Unless specifically quoted they are not guaranteed to meet ordinances of any local governing body and the responsibility of conforming to any local ordinance is assumed by the buyer.

### Inspection and testing, production estimates and performance

All working drawings or other materials provided by Brinkmann are for general information purposes only and may or may not relate to buyer's order or other equipment. Any specifications contained therein are not binding on Brinkmann except as expressly so stated. Brinkmann reserves the right to make, at any time, such changes in detail of design or construction as shall in the sole judgment of Brinkmann constitute an improvement over former practice. Production data, where given, are based on Brinkmann's careful analysis and understanding of the limits of accuracy, machinability of materials, amount of material to be removed, handling facilities provided, and location points but are nonetheless an estimate only and not guaranteed or warranted. In no event shall Brinkmann be responsible for performance figures supplied by other parties. If by written agreement the equipment is to be subject to acceptance tests before shipment, rejection under this clause must take place prior to shipment.

### Returned equipment

In no case is equipment to be returned without first obtaining written permission from Brinkmann. Unless otherwise expressly agreed an order for equivalent value must accompany returned equipment and all such returned equipment will be accepted for credit only after inspection. Equipment returned without good cause and for which no credit is given shall be subject to a restocking charge. Buyer returning equipment must pay transportation charges and bear risks of loss or damage to goods while in transit. Acceptance of returned products by Brinkmann's receiving department shall not bind Brinkmann nor have any force or effect unless acceptance is made by Brinkmann in writing.

# Questionnaire

Fax	+1 248 926 9405	Date	
E-Mail	sales@brinkmannpumps.com		

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 (GPM / l/min.)	
Pressure (PSI / bar)	

Dimensions	
Immersion depth	

Medium to be pumped	
Coolants	<input type="checkbox"/>
Oils	<input type="checkbox"/>
Temperature (°F / °C)	
Viscosity at pumping temperature (SSU / 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 / PPM)	

Drive			
laid out for line power	<input type="checkbox"/> 3 x 400 V, 50 Hz	<input type="checkbox"/> 3 x 440 V, 60 Hz	<input type="checkbox"/> 3 x 208-230 V, 60 Hz
	<input type="checkbox"/> 3 x 415 V, 50 Hz	<input type="checkbox"/> 3 x 460 V, 60 Hz	<input type="checkbox"/> 3 x 200-220 V, 60 Hz
	<input type="checkbox"/> 3 x 380 V, 50 Hz	<input type="checkbox"/> 3 x 480 V, 60 Hz	<input type="checkbox"/> other:
	<input type="checkbox"/> 3 x 200 V, 50 Hz	<input type="checkbox"/> 3 x 380 V, 60 Hz	
	<input type="checkbox"/> 1 x 230 V, 50 Hz	<input type="checkbox"/> 3 x 400 V, 60 Hz	

Motor	
Protective system IP55	
Insulation class (F)	
Ambient temperature (°F / °C)	
Variable frequency drive (Hz)	from      to
On/Off cycles (per min)	
Motor connection plug HAN	<input type="checkbox"/> yes

Other

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



BRINKMANN PUMPS has a global presence and direct representation throughout North America, Europe, and Asia. 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 Inc.**  
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Wixom, MI 48393  
United States

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58791 Werdohl  
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**Brinkmann Pumps Japan Co. Ltd.**  
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