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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	14 – 15
BFS2   FFS2, 60 Hz	<b>High pressure</b> 3.1 ... 15.2 GPM 145 ... 2175 PSI	16 – 19
TFS3   FFS3, 60 Hz	<b>High pressure</b> 6.7 ... 31.6 GPM 145 ... 2175 PSI	20 – 21
TFS4   FFS4, 60 Hz	<b>High pressure</b> 13.2 ... 62.4 GPM 145 ... 1740 PSI	22 – 23
TFS5   FFS5, 60 Hz	<b>High pressure</b> 29.3 ... 132.1 GPM 145 ... 1740 PSI	24 – 27
TFS6   FFS6, 60 Hz	<b>High pressure</b> 56.3 ... 232 GPM 145 ... 1160 PSI	28 – 29

## High Pressure Pumps

### Screw spindles

**50 Hz**



BFS1   FFS1, 50 Hz	<b>High pressure</b> 0.7 ... 5.3 GPM 145 ... 2175 PSI	30 – 31
BFS2   FFS2, 50 Hz	<b>High pressure</b> 2.2 ... 12.5 GPM 145 ... 2175 PSI	32 – 35
TFS3   FFS3, 50 Hz	<b>High pressure</b> 5.0 ... 26.0 GPM 145 ... 2175 PSI	36 – 37
TFS4   FFS4, 50 Hz	<b>High pressure</b> 9.8 ... 51.3 GPM 145 ... 1740 PSI	38 – 39
TFS5   FFS5, 50 Hz	<b>High pressure</b> 22.7 ... 109 GPM 145 ... 1740 PSI	40 – 43
TFS6   FFS6, 50 Hz	<b>High pressure</b> 43.5 ... 191.5 GPM 145 ... 1160 PSI	44 – 45

## Electrical Features

### CE Motors acc. to EN 60034

Grade of protection	IP55
Type of insulation	F
Number of poles	2
Efficiencies	EN 60034-30, IE2 1.0 HP (0.75) < 10 HP (7.5 kW); IE3 ≥ 10 HP (7.5 kW)

60 Hz	208–230 V √√ 460 V √	440 V–480 V √	440 V–480 V Δ
up to 7.4 HP	Standard	●	●
10 HP – 13.4 HP	Standard	●	●
15 HP and higher	–	–	Standard

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

Available as a special design, e.g.:

60 Hz	200 V Δ	265 V Δ 460 V √	400 V √	400 V Δ	575 V √	575 V Δ
up to 7.4 HP	●	●	●	●	●	●
10 HP – 13.4 HP	●	●	●	●	●	●
15 HP and higher	–	□	□	□	□	□

50 Hz	200 V Δ	220–240 V Δ 380–420 V √	400 V √	400 V Δ	380–420 V Δ	500 V √	500 V Δ
up to 7.4 HP	●	●	●	●	●	●	●
10 HP – 13.4 HP	●	●	●	●	●	●	●
15 HP and higher	–	–	□	●	●	□	●

- Available
- Upon request

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, ± 5 %, 50 – 60 Hz.

### Comparison of motor efficiency classes worldwide

Efficiency Class	Europe	North America, Australia, New Zealand	China
Super premium efficiency	IE4	–	Grade 1
Premium efficiency	IE3	NEMA Premium	Grade 2
High efficiency	IE2	EPAct	Grade 3
Standard efficiency	IE1	–	–
Below standard efficiency	–	–	–

IE = International Efficiency

### Motors of 10 HP (7.5 kW) and larger

Motor design permits √ / Δ-starting.

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

### Motor cycle time

Motors less 4.0 HP (3 kW) ►  
up to 200 times per hour.

Motors from 4.0 HP (3 kW) to  
5.4 HP (4 kW) ►  
up to 40 times per hour.

Motors from 6.7 HP (5 kW) to  
15 HP (11 kW) ►  
up to 20 times per hour.

Motors 16 HP (12 kW) and larger ►  
up to 15 times per hour.

Higher on/off cycling frequencies are available upon request.

### UL/CSA Certification

Brinkmann motors up to 17.5 HP (13 kW) and up to max. 600 V are available as special designs with cUL-certification. Approval testing is carried out by the Underwriters Laboratories Inc. according to the UL 1004 Electric Motors Standard. The motor's name plate bears the identification:



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

Motors larger than 17.5 HP (13 kW) are available upon request with cRUus or CSA/UL approval testing.

Brinkmann motors ranging from 3.1 HP (2.3 kW) to 7.4 HP (5.5 kW) are available with the China Energy Label, GB18613-2012, Grade 3 and motors ranging from 10 HP (7.5 kW) to 17.5 HP (13 kW) are available with Grade 2 on request.

Additional country-specific approvals upon request.

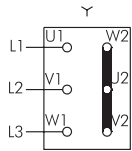
## Electrical Features

### Circuits

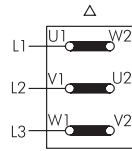
on request

Y (Star Connection)  
up to 7.4 HP  
(5.5 kW)

Δ (Delta Connection)  
10, 12, 15, 17.5 HP  
(7.5, 9, 11, 13 kW)



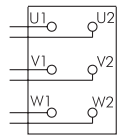
Y 440 V – 480 V  
60 Hz



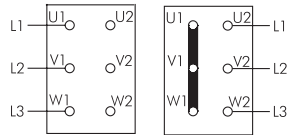
Δ 440 V – 480 V  
60 Hz

Optional

**Pole-changing motor with 4/2 poles** Y Y / Y  
for 50 % reduction of speed can be chosen

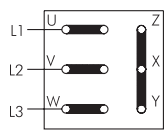


Dahlander circ.  
Y / Y Y  
with polechanger

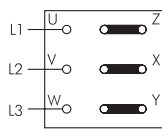


(n = 1700 RPM) (n = 3400 RPM)  
4-poles Y 2-poles Y Y  
without polechanger

**Voltage changing 1 : 2** Y Y / Y  
e. g. 208 – 230 V / 460 V, 60 Hz



Low Voltage



High Voltage

### Installation

#### Brinkmann Screw Pump with connector

DESINA includes a complete concept for standardization and decentralization of the electronic and fluid technical installation of machine tool OEMs, the automotive industry and its suppliers. The specifications for the required components were defined in cooperation between the machine construction, automotive and supplier industry.

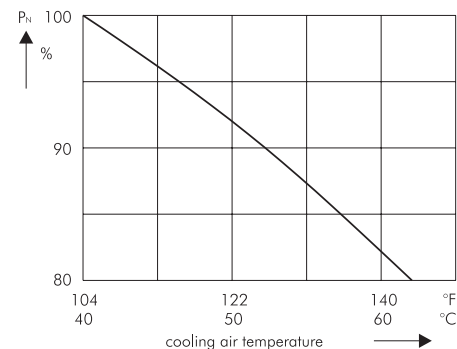
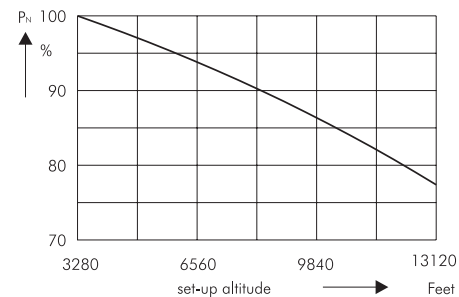
DESINA considers proven solutions such as open bus systems, industrial standards for connectors, etc. By standardizing components, interfaces and connection elements it is possible to realize highly varying field bus systems on a common physical basis.

Motors up to 7.4 HP (5.5 kW) are available with a HAN 10-pin connector, motors 10 HP (7.5 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



### Current / Rated current

The current stated in the data sheets is used for the dimensioning of electrical components. The effective rated current at rated voltage may be lower.

## Electrical Features



### Technical motor data

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

### Brinkmann motors

	Power 50 Hz / 60 Hz		Current 2 pole 50 Hz AMPS		Noise level max. dBA / 50 Hz	Current 2 pole 60 Hz AMPS		Noise level max. dBA / 60 Hz
	kW	HP	Y 380 V – 420 V	Δ 380 V – 420 V		Y 460 V	Δ 460 V	
IE2	B 1.3 / 1.5	B 1.75 / 2.0	3.0	–	63	3.0	–	67
	B 1.5 / 1.75	B 2.0 / 2.35	3.8	–	63	3.8	–	67
	B 1.7 / 1.95	B 2.3 / 2.6	4.1	–	63	4.1	–	67
	B 1.9 / 2.2	B 2.5 / 3.0	4.9	–	63	4.9	–	67
	B 2.2 / 2.55	B 3.0 / 3.4	5.3	–	63	5.3	–	67
	B 2.6 / 3.0	B 3.5 / 4.0	6.3	–	63	6.3	–	67
	B 3.3 / 3.8	B 4.4 / 5.1	8.0	–	71	8.0	–	75
	B 4.0 / 4.6	B 5.4 / 6.2	9.5	–	71	9.5	–	75
	B 5.0 / 5.75	B 6.7 / 7.7	12.0	–	71	12.0	–	75
	B 5.5 / 6.3	B 7.4 / 8.4	12.5	–	74	12.5	–	>75
IE3	B 7.5 / 8.6	B 10.0 / 11.5	–	14.2	74	–	14.2	>75
	B 9.0 / 10.3	B 12.0 / 13.8	–	16.9	74	–	16.9	>75
	B 11.0 / 12.6	B 15.0 / 17.0	–	21.5	>75	–	21.5	>75
	B 13.0 / 15.0	B 17.5 / 20.0	–	24.8	>75	–	24.8	>75

### Standard motors

	Power 50 Hz / 60 Hz		Current 2 pole 50 Hz AMPS	Noise level dBA 50 Hz	Current 2 pole 60 Hz AMPS	Noise level dBA 60 Hz	Current 4 pole 50 Hz AMPS	Noise level dBA 50 Hz	Current 4 pole 60 Hz AMPS	Noise level dBA 60 Hz
	kW	HP	Y 400 V		Y 460 V		Y 400 V		Y 460 V	
IE2	0.75 / 0.86	1.0 / 1.15	1.71	60	1.65	64	1.8	52	1.7	56
	1.1 / 1.3*	1.5 / 1.75*	2.25	60	2.15	64	2.5	56	2.4	60
	1.5 / 1.75	2.2 / 2.35	3.2	66	3.1	70	3.3	56	3.3	60
	2.2 / 2.55	3.0 / 3.4	4.5	66	4.4	70	4.6	56	4.5	60
	3.0 / 3.45	4.0 / 4.6	6.1	67	5.8	71	6.2	56	6.0	60
	4.0 / 4.6*	5.4 / 6.2*	7.8	67	7.5	71	8.2	59	8.0	63
	5.5 / 6.3	7.4 / 8.4	10.5	72	10.2	76	11.3	62	10.9	66
			Δ 400 V		Δ 460 V		Δ 400 V		Δ 460 V	
IE3	7.5 / 8.6	10.0 / 11.5	13.1	72	13.1	75	14.3	65	14.2	68
	11.0 / 12.6	15.0 / 17.0	20.0	75	19.5	>75	20.5	66	20.0	70
	15.0 / 17.3	20.0 / 23.0	27.0	75	27.0	>75	28.5	66	28.0	70
	18.5 / 21.3	25.0 / 28.5	32.0	75	32.0	>75	35.0	66	34.5	70
	22.0 / 25.3	29.5 / 34.0	38.5	75	38.9	>75	41.0	68	41.0	70
	30.0 / 33.5*	40.0 / 45.0*	53.0	>75	52.0	>75	55.0	68	55.0	71
	37.0 / 41.5*	50.0 / 56.0*	65.0	>75	63.0	>75	66.0	68	66.0	72
	45.0 / 51.0*	60.0 / 68.0*	78.0	>75	77.0	>75	80.0	68	81.0	72
	55.0 / 62.0*	74.0 / 83.0*	95.0	>75	92.0	>75	96.0	68	97.0	72
	75.0 / 86.0	101 / 115	128.0	>75	128.0	>75				
	90.0 / 101	121 / 135	152.0	>75	148.0	>75				
	110 / 123	147 / 165	183.0	>75	179.0	>75				

Noise level with +3 dBA tolerance for standard motors. **Special voltages and cycles are available upon request.** Depending on actual motor rating and sizing deviations in pump and motor configurations are possible. Motors from various suppliers will be used, depending on availability. \* Different horsepower rating at 60 Hz, see data sheet for 4 pole operation.

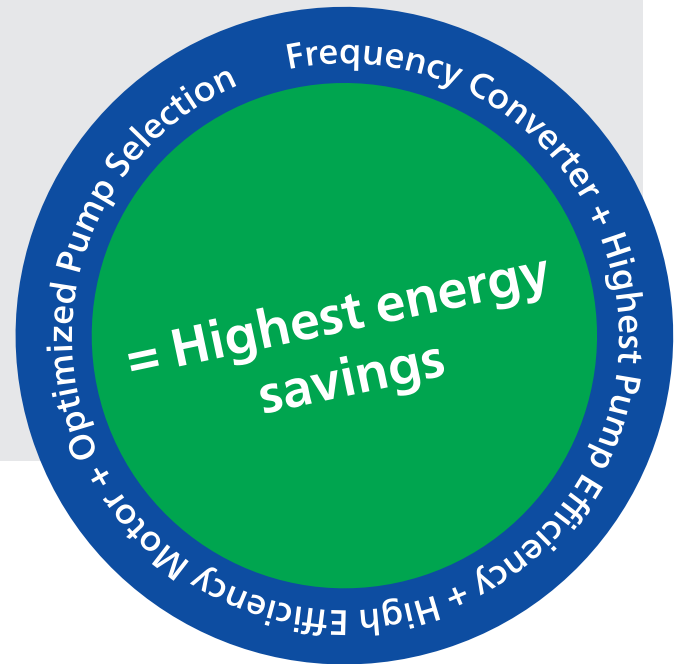
## Control / Regulation

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.

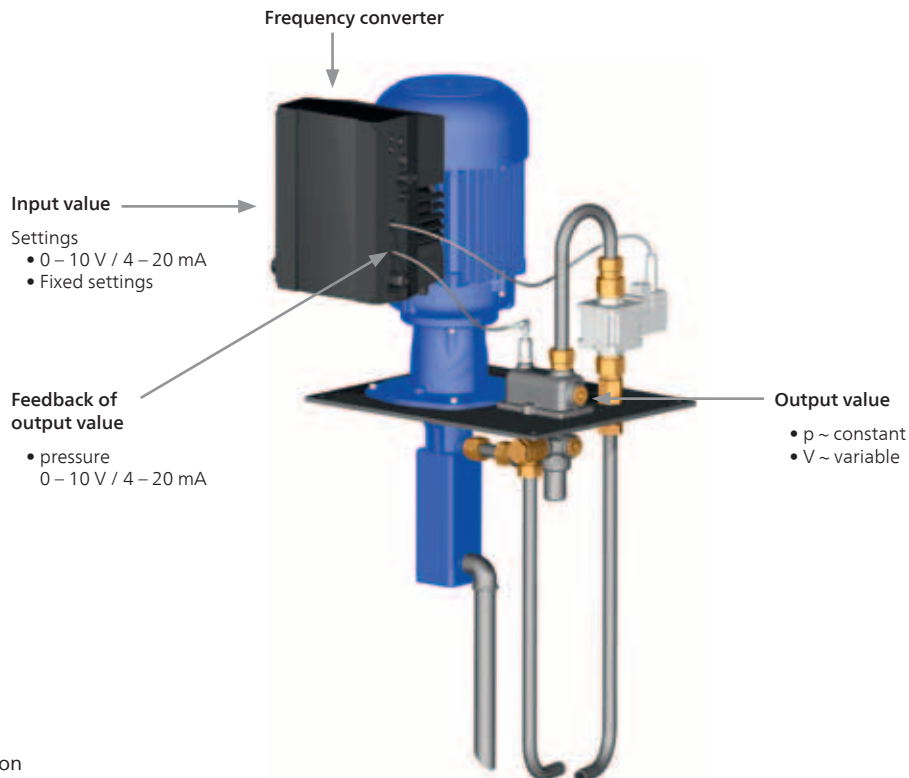


Fig. 1: Scheme of regulation

## Control / Regulation

### Variable Speed Control of High Pressure Pumps

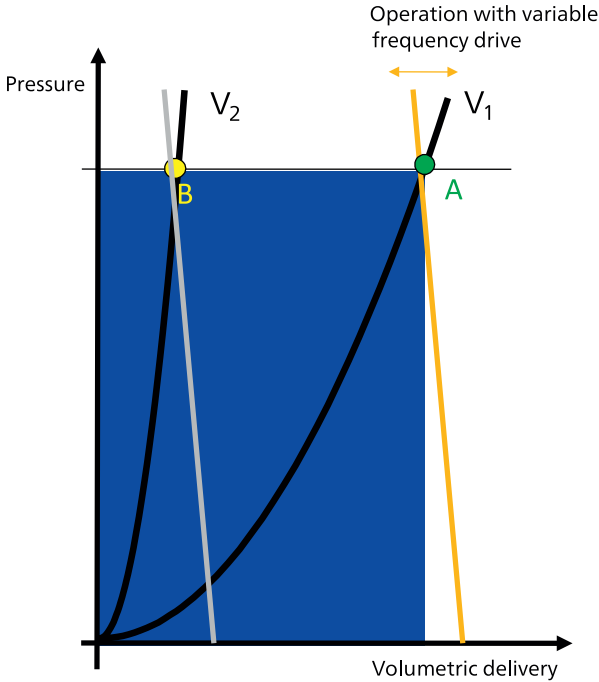


Fig. 2: Potential energy savings of a screw pump with variable frequency drive and two consumers.

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

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

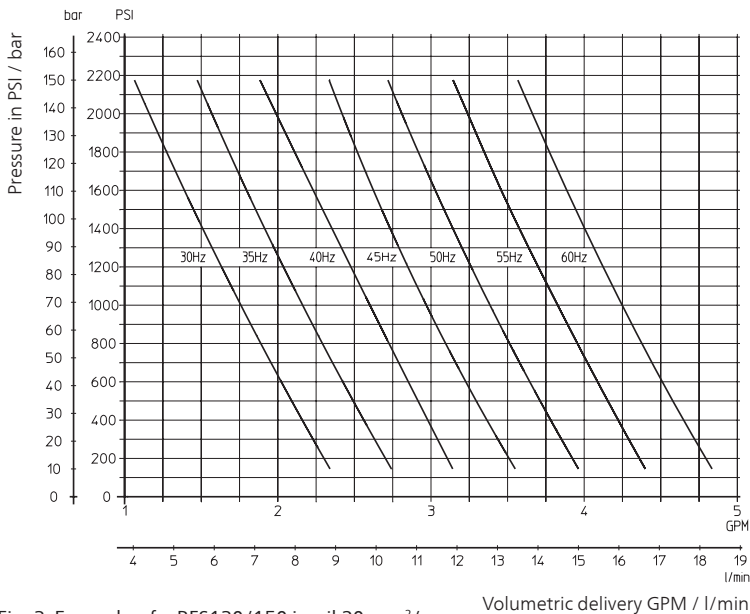
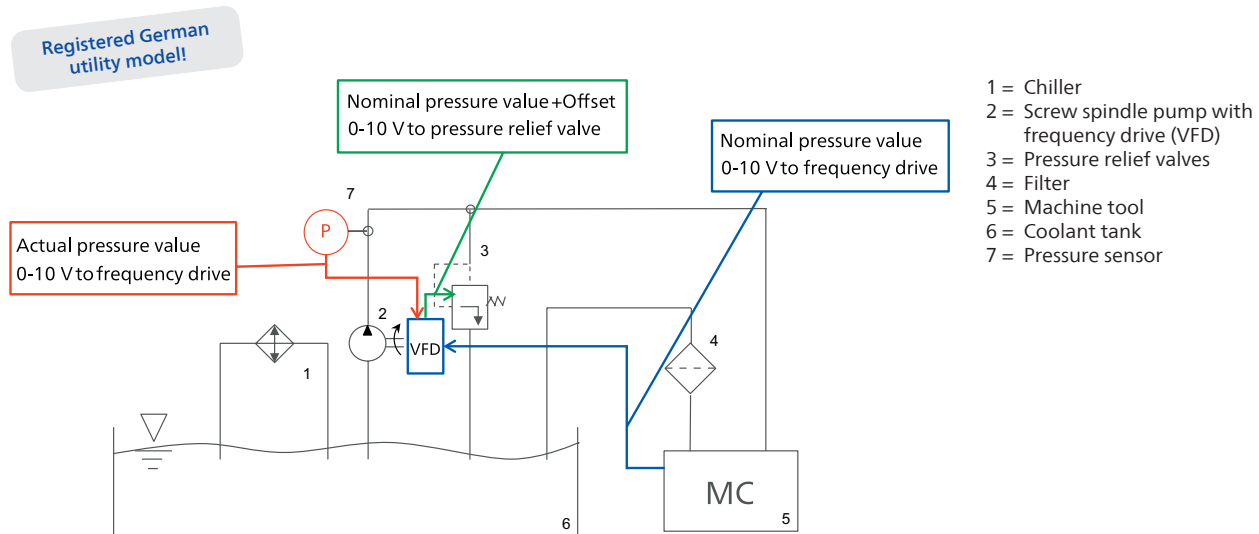


Fig. 3: Example of a BFS130/150 in oil 20 mm<sup>2</sup>/s

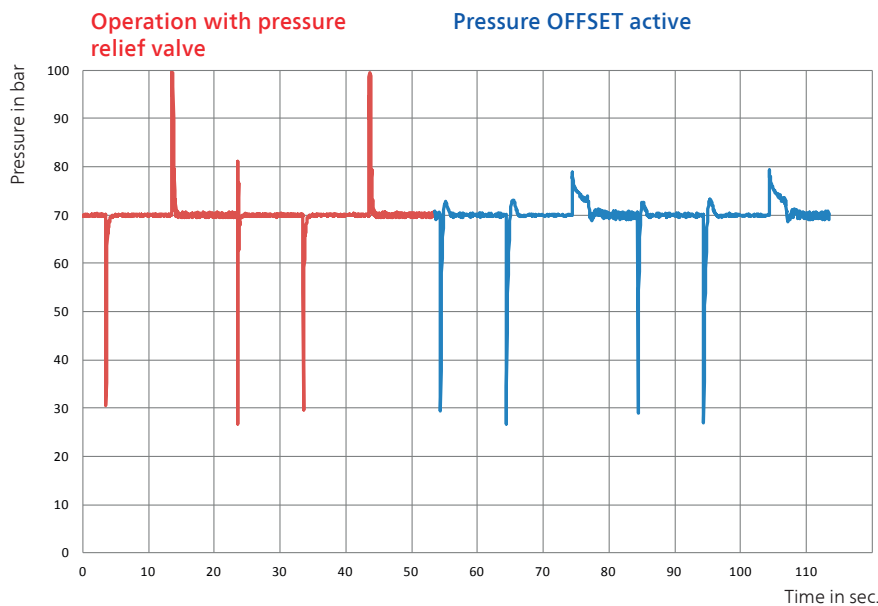
## Control / Regulation

### 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

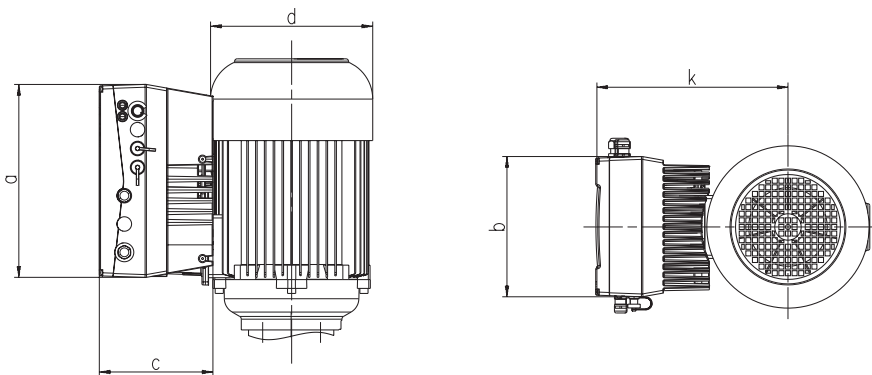


## Control / Regulation

### TECHNICAL DATA Frequency converter FKO (1.5 – 10 HP)

Function	Specification			
Rated voltage	3 AC 400 V -10 % ... 480 V +10 %			
Rated frequency	50/60 Hz			
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 (-I <sub>max</sub> = 10 mA) or 0 – 20 mA (burden R = 500 Ω)			
Process control	PID			
Relay outputs	2 x NO contacts 250 V AC 2 A			
USB interface	USB on plug M12 (RS485/RS232)			
Manual control unit (optional)	MMI with cable			
BUS modules (optional)	Profibus DP, CANopen, EtherCAT			
UL approval	yes			

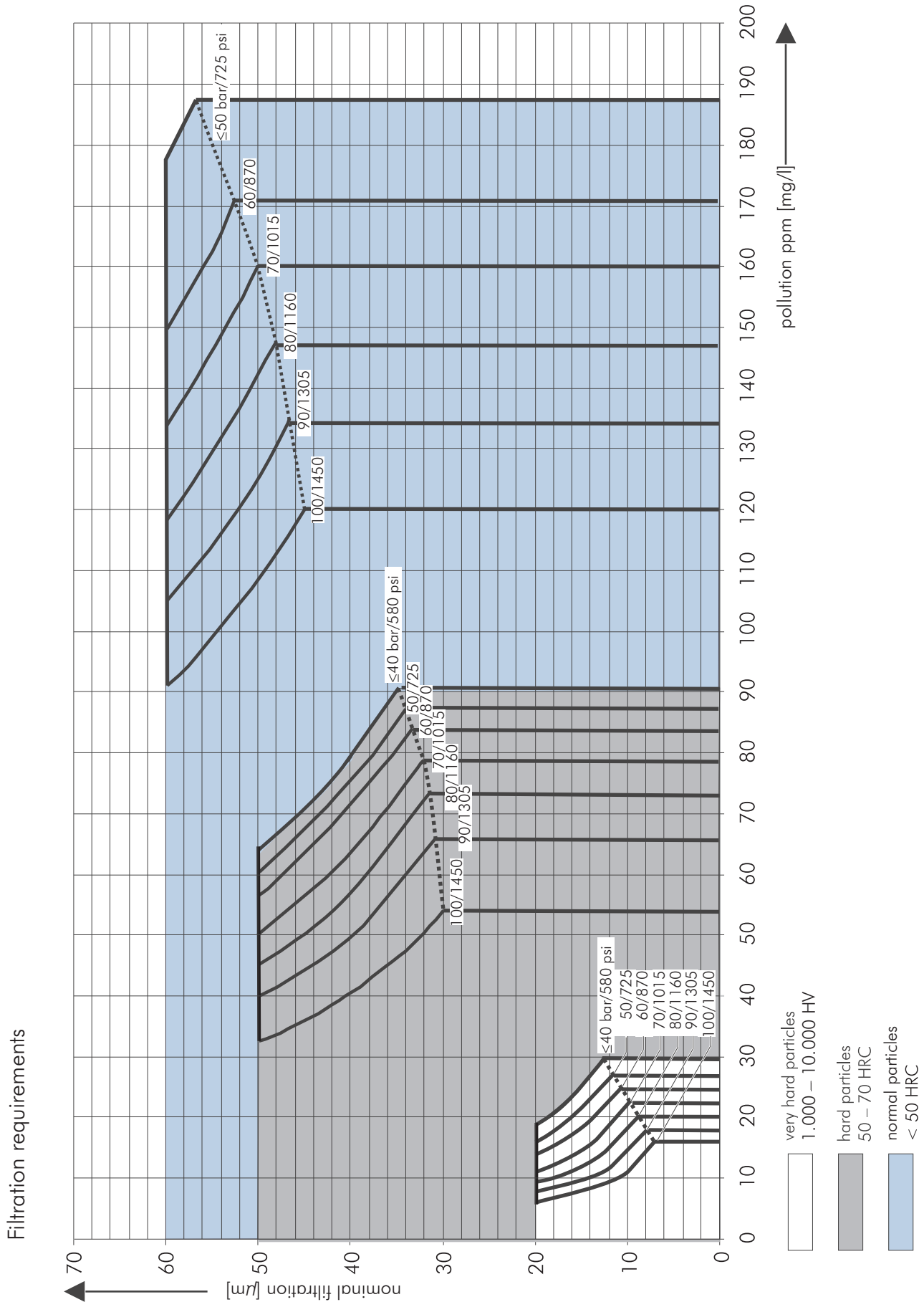
### Dimensions



Motor power HP	housing size	a inch	b inch	c inch	d inch	k inch
1.5 – 2.3	A	9.17	6.02	4.72	6.93	8.70
2.5 – 5.4	B	10.63	7.44	5.24	8.58	9.49
6.7 – 12	C	12.09	9.17	7.13	10.16	12.05
15 – 29.5	D	16.30	11.57	9.77	12.36	15.75



# Models and Applications for High Pressure Screw Pumps



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

Screw spindle pumps with their **silicon carbide spindle housing** and highly wear resistant spindles are capable of achieving extremely **high pressures**.  
Brinkmann high pressure screw pumps are designed for pumping filtered and **lubricating** fluids such as coolant oils and 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  
Recommended filtration levels  
General Machining (Turning, milling, drilling) < 50 µm  
Grinding and machining of aluminum (CBN etc.) < 20 µm  
For additional information please refer to page 11.

## Materials of construction

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

Version	Model Index	Immersion Style						Inline Style for inline installation – horizontal or vertical with mechanical seal; positive suction pressure of up to 100 PSI					
		BFS1	BFS2	TFS3	TFS4	TFS5	TFS6	FFS1	FFS2	FFS3	FFS4	FFS5	FFS6
Highly wear resistant SIC-bushing around labyrinth seal and coated driving male spindle	-KBT5	○	○	○	●	●	●	○	○	○	●	●	●
Specially coated outer female spindles	-N	○	○	○	○	○	●	○	○	○	○	○	●
Axial thrust compensation through radial slide bushing inside the suction cover	-A	○	○	●	●	●	●	○	○	●	●	●	●
Inline installation – vertical Mechanical seal and internal leakage return; positive suction pressure of up to 100 PSI	-G	○	○	○	○	○	●	●	●	●	●	●	●
Positive suction pressure of 100 – 300 PSI (With leakage port, please see page 49)	-G4	○	○	○	○	○	○	○	○	○	○	○	○
Viscosity > 200 SSU (> 45 mm <sup>2</sup> /s)		○	○	○	○	○	○	○	○	○	○	○	○
4-pole motor	-4	○	○	○	○	○	○	○	○	○	○	○	○

- Available upon request
- Standard

**Order code for:**  
Inline style for vertical installation (without footmount bracket):

BFS1...2 / Pressure-G  
TFS3...6 / Pressure-G  
e.g. TFS376/40-G

**Order code for:**  
Inline style for horizontal or vertical installation (with footmount bracket):

FFS1...6 / Pressure  
e.g. FFS260/40

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

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

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

Viton® is a registered trademark of DuPont.

# 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

### Recommended filtration levels

General Machining (Turning, milling, drilling) < 50 µm

Machining of materials of limited hardness (not for grinding applications).

For additional information please refer to page 11.

## Materials of construction

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

	Model Index	Immersion Style	Inline Style for inline installation – horizontal or vertical with mechanical seal; positive suction pressure of up to 100 PSI
Version		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 upon request
- Standard

Dimensional data for screw spindle pumps with cast iron spindle housings are identical to those with silicon carbide housings.

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

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

Viton® is a registered trademark of DuPont.

# High Pressure Pumps

## BFS1, FFS1

### Screw spindles

60 Hz

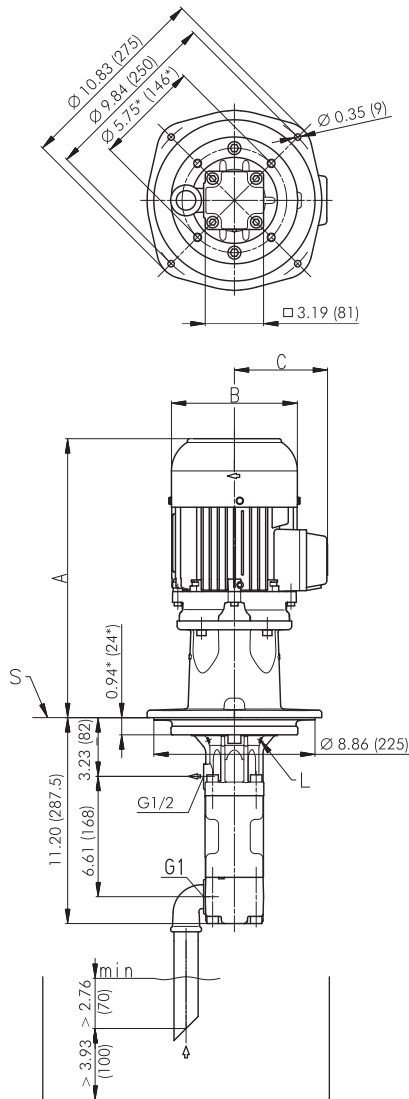
Pressure max.	Flow at viscosity		2-pole motor rotation speed 3500 RPM					4-pole motor rotation speed 1750 RPM						
			Power consumption of viscosity		Motor	Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight	
			5 SSU	90 SSU	immersion version	foot mounted version		5 SSU	90 SSU	5 SSU	90 SSU			
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs	
<b>BFS1305</b>	Q <sub>Th</sub> <sup>1)</sup> 5.0		-	-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 2.5		-	-	-	-
10 / 145	4.6	4.8	0.8	0.8	B 2	1.15	86	2.1	2.3	0.4	0.4	1.15	64	
20 / 290	4.3	4.7	1.2	1.2	B 2	1.75	86	1.8	2.2	0.5	0.5	1.15	64	
30 / 435	4.1	4.6	1.6	1.6	B 2	2.35	86	1.6	2.1	0.8	0.8	1.15	64	
40 / 580	3.8	4.5	2.0	2.0	B 2.35	2.35	86	1.3	2.0	0.9	1.1	1.7	68	
50 / 725	3.6	4.4	2.4	2.5	B 2.6	3.4	86	1.1	1.9	1.2	1.3	1.7	68	
60 / 870	3.4	4.3	2.8	3.0	B 3	3.4	95	0.8	1.8	1.3	1.5	1.7	68	
70 / 1015	3.1	4.2	3.2	3.4	B 3.4	4.6	95	-	1.7	-	1.7	2.35	75	
80 / 1160	2.9	4.1	3.8	3.9	B 4	4.6	97	-	1.7	-	2.0	2.35	75	
90 / 1305	2.7	4.1	4.2	4.3	B 5.1	4.6	119	-	1.6	-	2.1	2.35	75	
100 / 1450	2.5	4.0	4.6	4.7	B 5.1	6.2	119	-	1.5	-	2.4	3.4	90	
110 / 1595	2.3	3.9	5.0	5.2	B 6.2	6.2	126	-	1.4	-	2.7	3.4	90	
120 / 1740	2.1	3.8	5.4	5.6	B 6.2	6.2	126	-	1.3	-	2.8	3.4	90	
130 / 1885	-	3.7	-	6.0	B 6.2	8.4	126	-	-	-	-	-	-	
140 / 2030	-	3.6	-	6.6	B 7.7	8.4	161	-	-	-	-	-	-	
150 / 2175	-	3.6	-	7.0	B 7.7	8.4	161	-	-	-	-	-	-	
<b>BFS1405</b>	Q <sub>Th</sub> <sup>1)</sup> 6.7		-	-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 3.3		-	-	-	-
10 / 145	6.1	6.4	0.9	0.9	B 2	1.75	86	2.8	3.1	0.4	0.5	1.15	64	
20 / 290	5.8	6.3	1.5	1.6	B 2	2.35	86	2.4	3.0	0.7	0.8	1.15	64	
30 / 435	5.4	6.2	2.0	2.1	B 2.35	2.35	86	2.1	2.8	0.9	1.1	1.7	68	
40 / 580	5.2	6.1	2.5	2.7	B 3	3.4	95	1.8	2.7	1.2	1.3	1.7	68	
50 / 725	4.9	5.9	3.2	3.4	B 3.4	4.6	95	1.5	2.6	1.5	1.6	2.35	75	
60 / 870	4.6	5.8	3.8	3.9	B 4	4.6	97	1.2	2.5	1.7	2.0	2.35	75	
70 / 1015	4.3	5.7	4.3	4.4	B 5.1	6.2	119	1.0	2.3	2.0	2.3	3.4	90	
80 / 1160	4.1	5.5	4.8	5.1	B 6.2	6.2	126	-	2.2	-	2.5	3.4	90	
90 / 1305	3.9	5.4	5.4	5.6	B 6.2	6.2	126	-	2.1	-	2.8	3.4	90	
100 / 1450	3.6	5.3	6.0	6.3	B 7.7	8.4	161	-	2.0	-	3.1	3.4	90	
110 / 1595	3.3	5.2	6.6	6.8	B 7.7	8.4	161	-	1.8	-	3.4	4.6	101	
120 / 1740	3.1	5.1	7.1	7.4	B 7.7	8.4	161	-	1.7	-	3.6	4.6	101	
130 / 1885	2.8	4.9	7.6	8.0	B 8.4	8.4	161	-	-	-	-	-	-	
140 / 2030	2.6	4.8	8.2	8.6	B 11.5	11.5	207	-	-	-	-	-	-	
150 / 2175	2.3	4.7	8.9	9.3	B 11.5	11.5	207	-	-	-	-	-	-	

<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

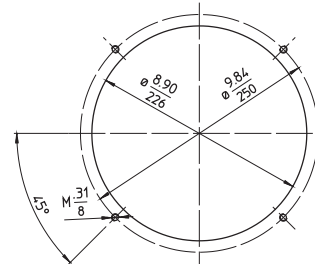
## BFS1, FFS1

60 Hz

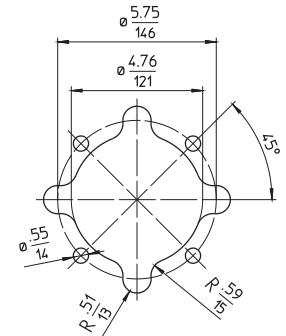


### Mounting hole patterns

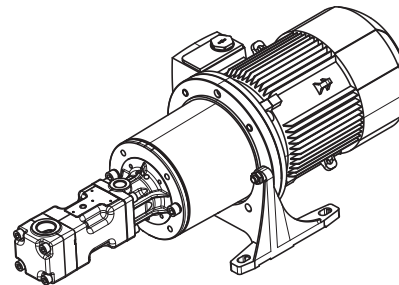
BFS1 / BFS2



TFS1 / TFS2



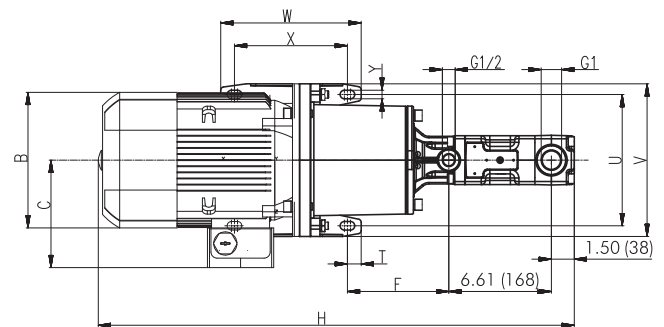
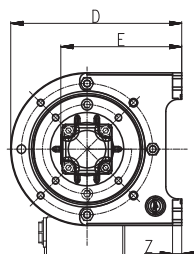
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 2 / 2.35 / 2.6	15.31	6.93	5.12
B 3 / 3.4	16.30	6.93	5.12
B 4	16.69	6.93	5.12
B 5.1 / 6.2	18.82	8.58	5.91
B 7.7 / 8.4	20.24	10.16	7.48
B 11.5	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
1.15 / 1.75	1.15	6.26	4.76	8.35	6.10	5.43	26.61	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2.35	1.7 / 2.35	7.01	4.96	8.35	6.10	5.43	28.39	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3.4	—	7.09	4.96	8.35	6.10	5.43	28.39	0.59	7.09	8.27	3.54	2.36	0.43	0.47
—	3.4 / 4.6	7.80	6.54	11.02	7.80	6.54	30.94	0.89	8.46	9.84	10.24	7.28	0.55	0.59
4.6	—	7.80	6.54	11.02	7.80	6.54	30.94	0.89	8.46	9.84	9.06	7.28	0.55	0.59
6.2	—	8.74	6.97	11.02	7.80	6.54	30.71	0.89	8.46	9.84	9.06	7.28	0.55	0.59
8.4	—	10.31	7.95	13.19	8.98	6.73	33.74	0.89	10.43	11.81	10.63	8.86	0.55	0.71
11.5	—	10.31	7.95	13.19	8.98	6.73	36.02	0.89	10.43	11.81	10.63	8.86	0.55	0.71

# High Pressure Pumps

## BFS2, FFS2

### Screw spindles

60 Hz

Pressure max.	Flow at viscosity		2-pole motor rotation speed 3500 RPM					4-pole motor rotation speed 1750 RPM					
			Power consumption of viscosity		Motor	Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
			5 SSU	90 SSU	immersion version	foot mounted version		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>	<b>Q<sub>Th</sub><sup>1)</sup> 8.3</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 4.2</b>		-	-	-	-
10 / 145	7.8	8.1	1.1	1.2	B 2	1.75	88	3.7	4.0	0.5	0.7	1.15	64
20 / 290	7.7	8.1	1.9	1.9	B 2.35	2.35	88	3.5	3.9	0.9	0.9	1.15	64
30 / 435	7.5	8.0	2.5	2.7	B 3	3.4	97	3.4	3.9	1.2	1.3	1.7	71
40 / 580	7.3	7.9	3.2	3.4	B 3.4	4.6	97	3.2	3.8	1.6	1.7	2.35	75
50 / 725	7.2	7.9	3.9	4.2	B 5.1	4.6	121	3.0	3.7	1.9	2.0	2.35	75
60 / 870	7.0	7.8	4.7	4.8	B 5.1	6.2	121	2.9	3.6	2.3	2.4	3.4	90
70 / 1015	6.9	7.7	5.4	5.6	B 6.2	6.2	126	2.7	3.6	2.7	2.8	3.4	90
80 / 1160	6.7	7.7	6.0	6.3	B 7.7	8.4	163	2.6	3.5	3.0	3.1	3.4	90
90 / 1305	6.6	7.6	6.7	7.1	B 7.7	8.4	163	2.4	3.4	3.4	3.5	4.6	101
100 / 1450	6.4	7.5	7.5	7.8	B 8.4	8.4	163	2.2	3.4	3.6	3.9	4.6	101
110 / 1595	6.3	7.5	8.2	8.6	B 11.5	11.5	209	-	3.3	-	4.3	4.6	101
120 / 1740	6.1	7.4	8.9	9.3	B 11.5	11.5	209	-	3.2	-	4.6	6.1	117
130 / 1885	6.0	7.3	9.5	10.1	B 11.5	11.5	209	-	3.2	-	5.0	6.1	117
140 / 2030	5.8	7.3	10.3	10.7	B 11.5	11.5	209	-	3.1	-	5.4	6.1	117
150 / 2175	5.7	7.2	11.0	11.5	B 13.8	17	223	-	3.1	-	5.6	6.1	117
<b>BFS2385</b>	<b>Q<sub>Th</sub><sup>1)</sup> 9.9</b>		-	-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 4.9</b>		-	-	-	-
10 / 145	9.3	9.6	1.2	1.2	B 2	1.75	88	4.4	4.7	0.5	0.5	1.15	64
20 / 290	9.1	9.6	2.1	2.1	B 2.35	3.4	88	4.2	4.6	1.1	1.1	1.7	71
30 / 435	8.9	9.5	3.0	3.0	B 3.4	3.4	97	4.0	4.5	1.5	1.5	1.7	71
40 / 580	8.7	9.4	3.8	3.9	B 4	4.6	97	3.8	4.5	1.9	1.9	2.35	75
50 / 725	8.6	9.3	4.6	4.7	B 5.1	6.2	121	3.6	4.4	2.3	2.4	3.4	90
60 / 870	8.4	9.3	5.5	5.6	B 6.2	6.2	126	3.4	4.3	2.7	2.8	3.4	90
70 / 1015	8.2	9.2	6.3	6.4	B 7.7	8.4	163	3.2	4.3	3.1	3.2	4.6	101
80 / 1160	8.0	9.1	7.1	7.4	B 7.7	8.4	163	3.1	4.2	3.5	3.6	4.6	101
90 / 1305	7.8	9.0	7.9	8.2	B 8.4	8.4	163	2.9	4.1	3.9	4.2	4.6	101
100 / 1450	7.7	9.0	8.9	9.1	B 11.5	11.5	209	2.7	4.0	4.3	4.6	6.1	117
110 / 1595	7.5	8.9	9.7	9.9	B 11.5	11.5	209	-	4.0	-	5.0	6.1	117
120 / 1740	7.3	8.8	10.5	10.9	B 11.5	11.5	209	-	3.9	-	5.5	6.1	117
130 / 1885	7.1	8.7	11.3	11.8	B 13.8	17	223	-	3.8	-	5.9	8.4	139
140 / 2030	6.9	8.7	12.1	12.6	B 13.8	17	223	-	3.8	-	6.3	8.4	139
150 / 2175	6.8	8.6	13.0	13.5	B 17	17	265	-	3.7	-	6.7	8.4	139

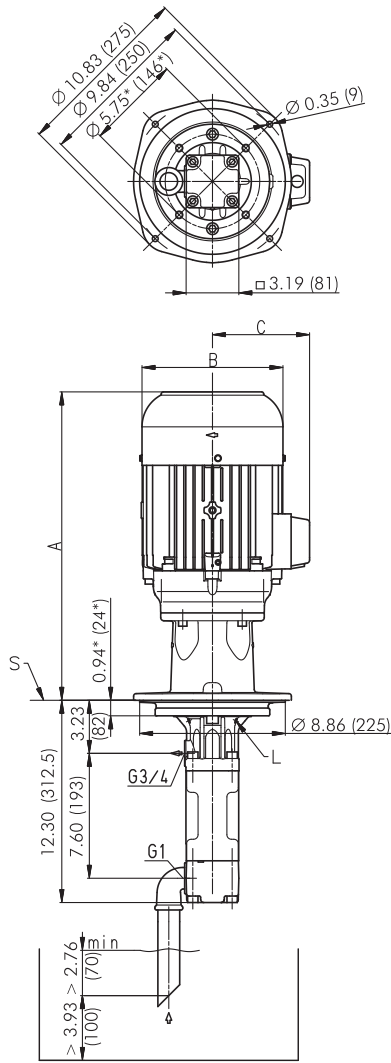
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

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

# Characteristics and dimensions

## BFS2, FFS2

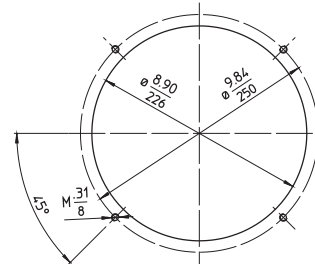
60 Hz



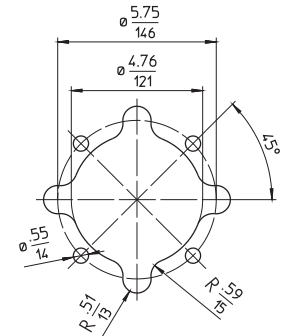
\*) Dimensions for 4-pole standard motor upon request  
 L = Leakage hole  
 S = Mounting plate, please refer to the cut-out of mounting hole

### Mounting hole patterns

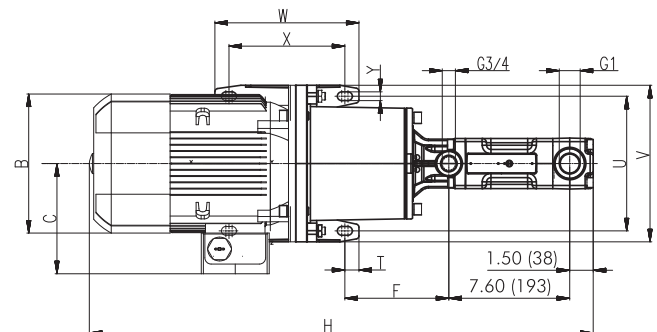
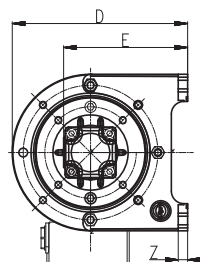
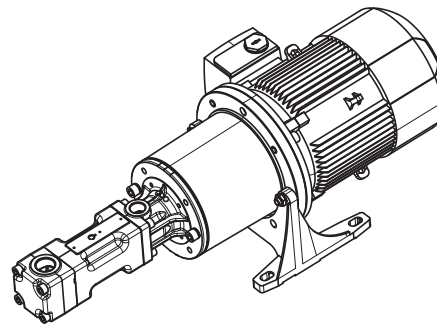
#### BFS1 / BFS2



#### 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 / 2.35	15.31	6.93	5.12
B 3 / 3.4	16.30	6.93	5.12
B 4	16.69	6.93	5.12
B 5.1 / 6.2	18.82	8.58	5.91
B 7.7 / 8.4	20.24	10.16	7.48
B 11.5 / 13.8	24.49	10.16	7.60
B 17	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
1.75	1.15	6.26	4.76	8.35	6.10	5.43	27.60	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2.35	1.7 / 2.35	7.01	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3.4	—	7.09	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
—	3.4 / 4.6	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
4.6	—	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
—	6.1	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
6.2	—	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
8.4	8.4	10.31	7.95	13.19	8.98	6.73	34.72	0.89	10.43	11.81	10.63	8.86	0.55	0.71
11.5	—	10.31	7.95	13.19	8.98	6.73	37.01	0.89	10.43	11.81	10.63	8.86	0.55	0.71
17	—	12.36	9.33	16.14	10.94	8.27	41.77	0.79	11.81	13.78	12.01	10.43	0.71	0.71

# High Pressure Pumps

## BFS2, FFS2

### Screw spindles

Pressure max.		2-pole motor rotation speed 3500 RPM						4-pole motor rotation speed 1750 RPM						
		Flow at viscosity		Power consumption of viscosity		Motor	Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
		5 SSU	90 SSU	5 SSU	90 SSU	immersion version	foot mounted version		5 SSU	90 SSU	5 SSU	90 SSU	HP	
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs	
<b>BFS2505</b>		Q <sub>Th</sub> <sup>1)</sup> 13.0		-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 6.5		-	-	-	-
10 / 145	12.3	12.7	1.5	1.6	B 2.35	2.35	88	5.8	6.2	0.7	0.8	1.15	64	
20 / 290	12.0	12.6	2.7	2.7	B 3.4	3.4	97	5.5	6.1	1.3	1.3	1.7	71	
30 / 435	11.8	12.5	3.8	3.9	B 4	4.6	97	5.3	6.0	1.9	1.9	2.35	75	
40 / 580	11.5	12.4	4.8	5.1	B 5.1	6.2	121	5.0	5.9	2.4	2.5	3.4	90	
50 / 725	11.3	12.3	5.9	6.2	B 7.7	8.4	163	4.8	5.8	3.0	3.1	3.4	90	
60 / 870	11.1	12.2	7.0	7.4	B 7.7	8.4	163	4.6	5.7	3.5	3.6	4.6	101	
70 / 1015	10.9	12.1	8.2	8.4	B 11.5	11.5	209	4.4	5.6	4.0	4.3	4.6	101	
80 / 1160	10.6	12.0	9.3	9.7	B 11.5	11.5	209	4.1	5.5	4.6	4.8	6.1	117	
90 / 1305	10.5	11.9	10.3	10.9	B 11.5	11.5	209	3.9	5.4	5.1	5.4	6.1	117	
100 / 1450	10.3	11.8	11.4	11.9	B 13.8	17	223	3.7	5.3	5.6	6.0	8.4	139	
110 / 1595	9.9	11.7	12.5	13.1	B 17	17	265	-	5.2	-	6.6	8.4	139	
120 / 1740	9.6	11.6	13.7	14.1	B 17	17	265	-	5.1	-	7.1	8.4	139	
130 / 1885	9.3	11.5	14.8	15.4	B 17	17	265	-	5.0	-	7.8	8.4	139	
140 / 2030	8.9	11.4	15.8	16.5	B 20	23	265	-	4.9	-	8.3	11.5	205	
150 / 2175	8.6	11.3	16.9	17.7	B 20	23	265	-	4.8	-	8.9	11.5	205	
<b>BFS2605</b>		Q <sub>Th</sub> <sup>1)</sup> 15.6		-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 7.8		-	-	-	-
10 / 145	14.7	15.2	1.7	2.0	B 3	3.4	97	6.9	7.4	0.8	0.9	1.15	64	
20 / 290	14.4	15.1	3.1	3.4	B 4	4.6	97	6.6	7.3	1.5	1.7	3.4	90	
30 / 435	14.1	14.9	4.4	4.8	B 5.1	6.2	121	6.3	7.1	2.1	2.4	3.4	90	
40 / 580	13.8	14.7	5.8	6.2	B 6.2	8.4	126	6.0	6.9	2.8	3.1	3.4	90	
50 / 725	13.5	14.6	7.0	7.6	B 7.7	8.4	163	5.7	6.8	3.5	3.9	4.6	101	
60 / 870	13.2	14.4	8.3	9.0	B 11.5	11.5	209	5.4	6.6	4.2	4.6	6.1	117	
70 / 1015	12.8	14.3	9.7	10.5	B 11.5	11.5	209	5.0	6.5	4.8	5.2	6.1	117	
80 / 1160	12.5	14.1	11.0	11.8	B 17	17	265	4.8	6.3	5.5	5.9	8.4	139	
90 / 1305	12.2	13.9	12.3	13.3	B 17	17	265	4.4	6.1	6.2	6.7	8.4	139	
100 / 1450	11.9	13.8	13.7	14.8	B 17	17	265	4.1	6.0	6.8	7.4	8.4	139	
110 / 1595	11.5	13.6	15.0	16.2	B 17	17	265	-	5.8	-	8.0	11.5	205	
120 / 1740	11.1	13.4	16.2	17.6	B 20	23	265	-	5.6	-	8.9	11.5	205	
130 / 1885	10.6	13.1	17.6	19.0	B 20	23	265	-	-	-	-	-	-	
140 / 2030	10.2	12.8	18.9	20.4	-	23	243	-	-	-	-	-	-	
150 / 2175	9.8	12.4	20.2	21.9	-	23	243	-	-	-	-	-	-	

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

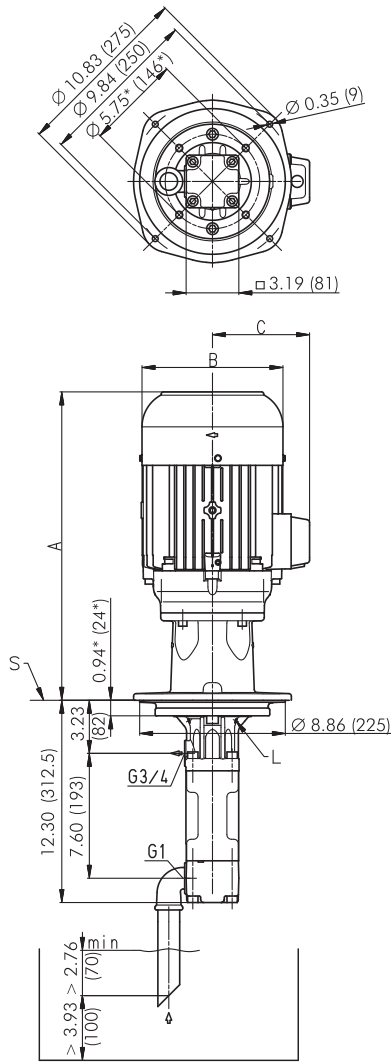
Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.



# Characteristics and dimensions

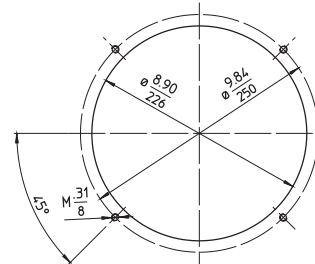
## BFS2, FFS2

60 Hz

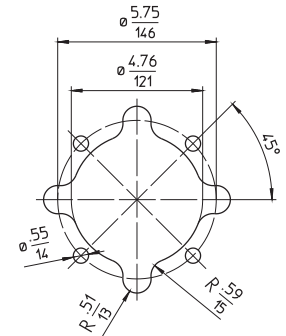


### Mounting hole patterns

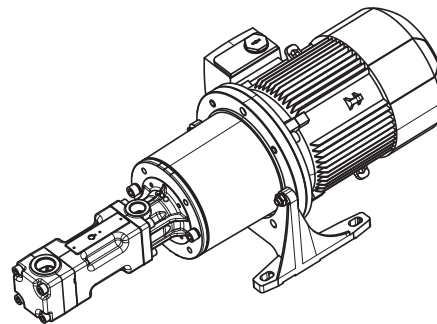
#### BFS1 / BFS2



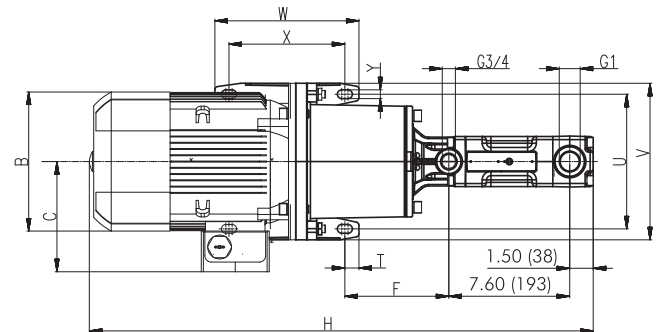
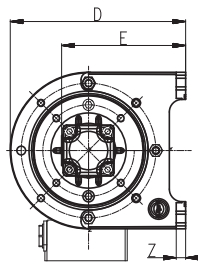
#### TFS1 / TFS2



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 2.35	15.31	6.93	5.12
B 3 / 3.4	16.30	6.93	5.12
B 4	16.69	6.93	5.12
B 5.1 / 6.2	18.82	8.58	5.91
B 7.7	20.24	10.16	7.48
B 11.5 / 13.8	24.49	10.16	7.60
B 17 / 20	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
-	1.15	6.26	4.76	8.35	6.10	5.43	27.60	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2.35	1.7 / 2.35	7.01	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3.4	-	7.09	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
-	3.4 / 4.6	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
4.6	-	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
-	6.1	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
6.2	-	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
8.4	8.4	10.31	7.95	13.19	8.98	6.73	34.72	0.89	10.43	11.81	10.63	8.86	0.55	0.71
11.5	11.5	10.31	7.95	13.19	8.98	6.73	37.01	0.89	10.43	11.81	10.63	8.86	0.55	0.71
17 / 23	-	12.36	9.33	16.14	10.94	8.27	41.77	0.79	11.81	13.78	12.01	10.43	0.71	0.71

# High Pressure Pumps

## TFS3, FFS3

### Screw spindles

60 Hz

2-pole motor rotation speed 3500 RPM							4-pole motor rotation speed 1750 RPM					
Pressure max.	Flow at viscosity		Power consumption 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> 20.4</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 10.2</b>		-	-	-	-
10 / 145	19.4	20.0	2.4	2.5	3.4	104	9.1	9.7	1.1	1.1	1.7	97
20 / 290	19.0	19.7	4.2	4.4	6.2	139	8.7	9.5	2.0	2.0	2.35	101
30 / 435	18.6	19.5	5.9	6.2	8.4	161	8.4	9.3	2.8	3.0	3.4	117
40 / 580	18.2	19.3	7.6	8.0	11.5	220	8.0	9.1	3.8	3.9	4.6	128
50 / 725	17.9	19.2	9.3	9.8	11.5	220	7.6	8.9	4.6	4.8	6.1	143
60 / 870	17.5	19.0	11.0	11.5	17	247	7.3	8.7	5.5	5.8	8.4	165
70 / 1015	17.2	18.8	12.7	13.4	17	247	7.0	8.6	6.3	6.7	8.4	165
80 / 1160	16.9	18.6	14.5	15.2	17	247	6.7	8.4	7.2	7.6	8.4	165
90 / 1305	16.6	18.5	16.2	17.0	23	269	6.3	8.3	8.0	8.6	11.5	232
100 / 1450	16.4	18.3	18.0	18.8	23	269	6.0	8.1	9.0	9.5	11.5	232
110 / 1595	15.9	18.2	19.7	20.5	23	269	-	8.0	-	10.5	11.5	232
120 / 1740	15.4	18.1	21.3	22.4	23	269	-	7.9	-	11.4	17	273
130 / 1885	15.0	18.0	23.1	24.1	29	315	-	7.7	-	12.3	17	273
140 / 2030	14.5	17.9	24.8	25.9	29	315	-	7.6	-	13.3	17	273
150 / 2175	14.1	17.8	26.6	27.8	34	375	-	7.6	-	14.2	17	273
<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	6.2	139	12.1	13.0	1.5	1.5	2.35	101
20 / 290	25.3	26.3	5.2	5.6	8.4	161	11.7	12.7	2.5	2.7	3.4	117
30 / 435	24.8	26.1	7.6	8.0	11.5	220	11.2	12.4	3.8	3.9	4.6	128
40 / 580	24.4	25.8	9.9	10.3	17	247	10.8	12.2	4.8	5.1	6.1	143
50 / 725	24.0	25.6	12.2	12.7	17	247	10.3	12.0	6.0	6.3	8.4	165
60 / 870	23.5	25.4	14.5	15.2	17	247	9.9	11.8	7.2	7.5	8.4	165
70 / 1015	23.1	25.2	16.8	17.6	23	269	9.5	11.5	8.3	8.7	11.5	232
80 / 1160	22.7	25.0	19.2	20.0	23	269	9.1	11.3	9.5	9.9	11.5	232
90 / 1305	22.4	24.8	21.5	22.4	23	269	8.7	11.1	10.6	11.1	11.5	232
100 / 1450	22.0	24.6	23.7	24.7	29	315	8.2	11.0	11.8	12.3	17	273
110 / 1595	21.4	24.4	26.0	27.1	29	315	-	10.8	-	13.5	17	273
120 / 1740	20.8	24.3	28.4	29.5	34	375	-	10.6	-	14.8	17	273
130 / 1885	20.2	23.9	30.7	31.9	45	538	-	-	-	-	-	-
140 / 2030	19.6	23.5	33.0	34.3	45	538	-	-	-	-	-	-
150 / 2175	19.1	23.1	35.3	36.6	45	538	-	-	-	-	-	-
<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	8.4	161	14.5	15.4	1.6	1.7	2.35	101
20 / 290	30.1	31.3	6.2	6.6	11.5	220	13.9	15.1	3.0	3.2	4.6	128
30 / 435	29.6	31.0	8.9	9.5	11.5	220	13.4	14.8	4.4	4.7	6.1	143
40 / 580	29.1	30.7	11.7	12.3	17	247	12.9	14.5	5.8	6.2	8.4	165
50 / 725	28.5	30.4	14.3	15.2	17	247	12.3	14.2	7.1	7.6	8.4	165
60 / 870	28.0	30.1	17.2	18.1	23	269	11.8	14.0	8.4	9.0	11.5	232
70 / 1015	27.5	29.9	19.8	20.9	23	269	11.3	13.7	9.8	10.5	11.5	232
80 / 1160	27.0	29.7	22.5	23.9	29	315	10.8	13.5	11.3	11.9	17	273
90 / 1305	26.5	29.4	25.3	26.7	29	315	10.3	13.3	12.6	13.4	17	273
100 / 1450	26.0	29.2	28.0	29.5	34	375	9.8	13.1	13.9	14.9	17	273
110 / 1595	25.2	29.0	30.8	32.5	45	538	-	12.8	-	16.4	23	342
120 / 1740	24.5	28.9	33.5	35.3	45	538	-	12.7	-	17.8	23	342
130 / 1885	23.7	28.4	36.3	38.2	45	538	-	-	-	-	-	-
140 / 2030	23.0	27.9	39.0	41.0	45	538	-	-	-	-	-	-
150 / 2175	22.2	27.5	41.7	43.9	56	602	-	-	-	-	-	-

<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.

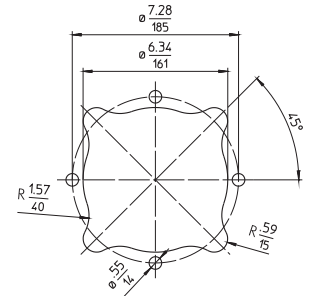
# Characteristics and dimensions

## TFS3, FFS3

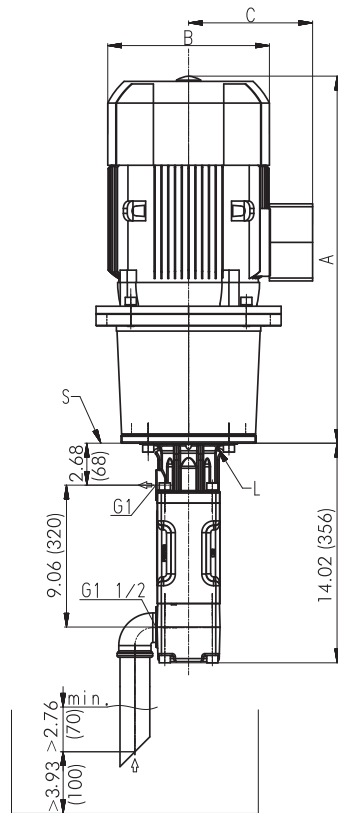
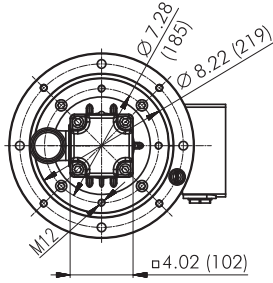
60 Hz

### Mounting hole patterns

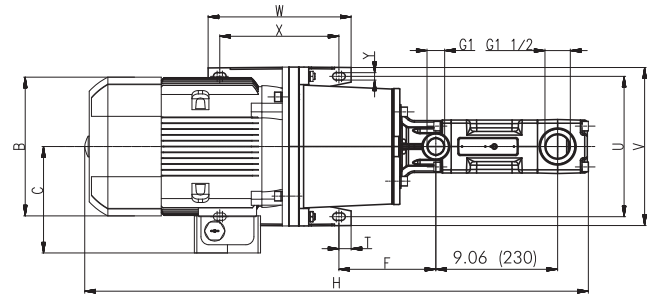
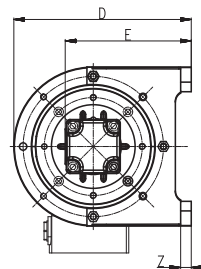
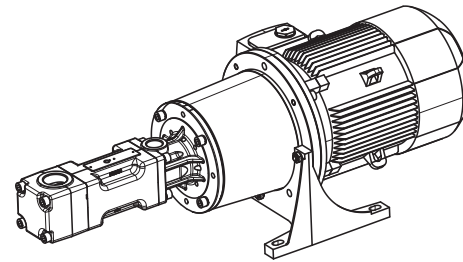
TFS3 / TFS4



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



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



Power 2-poles 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
-	1.7	18.74	7.01	4.96	8.35	6.50	5.98	32.76	0.59	7.09	8.27	3.54	2.36	0.43	0.47
-	2.35	20.98	7.01	4.96	8.35	6.50	5.98	32.76	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3.4	-	18.74	7.09	4.96	8.35	6.50	5.98	32.76	0.59	7.09	8.27	3.54	2.36	0.43	0.47
-	3.4	20.71	7.80	6.54	11.02	8.19	7.32	35.00	0.89	8.46	9.84	10.24	7.28	0.55	0.59
-	4.6	23.43	7.80	6.54	11.02	8.19	7.32	35.00	0.89	8.46	9.84	10.24	7.28	0.55	0.59
-	6.1	23.43	8.74	6.97	11.02	8.19	7.32	34.72	0.89	8.46	9.84	10.24	7.28	0.55	0.59
6.2	-	20.71	8.74	6.97	11.02	8.19	7.32	34.72	0.89	8.46	9.84	9.06	7.28	0.55	0.59
8.4	-	23.43	10.31	7.95	13.19	9.37	7.20	37.44	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	8.4	30.08	10.31	7.95	13.19	9.37	7.20	37.44	0.89	10.43	11.81	10.63	8.86	0.55	0.71
11.5	-	25.75	10.31	7.95	13.19	9.37	7.20	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
-	11.5	30.47	10.31	7.95	13.19	9.37	7.20	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
17 / 23	-	30.47	12.36	9.33	16.14	11.34	8.74	44.49	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	17	32.44	12.36	9.33	16.14	11.34	8.74	44.49	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	23	32.44	12.36	9.33	16.14	11.34	8.74	46.85	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29	-	32.44	12.36	9.33	16.14	11.34	8.74	46.46	0.79	11.81	13.78	12.01	10.43	0.71	0.71
34	-	32.44	14.02	11.26	16.14	11.34	8.74	46.46	0.79	11.81	13.78	12.01	10.43	0.71	0.71
45 / 56	-	34.68	15.59	12.40	18.11	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

### Screw spindles

60 Hz

Pressure max.	2-pole motor rotation speed 3500 RPM						4-pole motor rotation speed 1750 RPM					
	Flow at viscosity		Power consumption of viscosity		Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU	HP	Lbs	5 SSU	90 SSU	5 SSU	90 SSU	HP	Lbs
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	6.2	163	18.0	19.0	2.1	2.1	3.4	141
20 / 290	37.3	38.6	7.8	8.6	11.5	243	17.2	18.5	3.8	3.9	4.6	141
30 / 435	36.5	38.0	11.3	12.1	17	271	16.6	18.2	5.5	5.8	6.1	168
40 / 580	35.9	37.8	14.6	15.7	17	271	15.9	17.7	7.1	7.5	8.4	187
50 / 725	35.1	37.5	18.0	19.3	23	293	15.1	17.4	8.9	9.4	11.5	254
60 / 870	34.6	37.0	21.3	22.8	29	340	14.5	17.2	10.6	11.3	11.5	254
70 / 1015	33.8	36.7	24.7	26.4	29	340	14.0	16.6	12.2	13.0	17	298
80 / 1160	33.3	36.5	28.2	29.9	34	399	13.2	16.4	13.9	14.9	17	298
90 / 1305	32.8	36.2	31.5	33.5	45	562	12.7	16.1	15.6	16.6	23	366
100 / 1450	32.2	35.9	34.9	37.1	45	562	11.9	15.9	17.3	18.5	23	366
110 / 1595	31.7	35.7	38.2	40.6	45	562	-	15.6	-	20.4	23	366
120 / 1740	30.9	35.4	41.7	44.3	56	626	-	15.3	-	22.1	23	366
<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	8.4	183	24.0	25.4	2.7	2.8	3.4	141
20 / 290	49.7	51.3	10.1	11.4	17	271	23.0	24.8	5.0	5.2	6.1	168
30 / 435	48.6	50.7	14.6	16.2	23	293	22.2	24.0	7.1	7.6	8.4	187
40 / 580	47.8	50.2	19.0	20.9	23	293	21.1	23.5	9.4	10.1	11.5	254
50 / 725	47.0	49.7	23.6	25.7	29	340	20.3	23.2	11.7	12.5	17	298
60 / 870	46.2	49.4	28.2	30.6	34	399	19.6	22.7	13.9	14.9	17	298
70 / 1015	45.4	48.9	32.6	35.4	45	562	18.8	22.2	16.2	17.3	23	366
80 / 1160	44.6	48.3	37.1	40.2	45	562	18.0	21.9	18.4	19.7	23	366
90 / 1305	43.9	48.1	41.7	45.1	56	626	17.2	21.4	20.7	22.1	23	366
100 / 1450	43.3	47.8	46.1	49.8	56	626	16.4	21.1	22.9	24.5	29	381
110 / 1595	42.5	47.6	50.7	54.6	56	626	-	20.9	-	27.0	29	381
120 / 1740	41.7	47.3	55.1	59.4	68	869	-	20.6	-	29.4	34	415
<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	11.5	243	29.1	30.1	3.1	3.6	4.6	141
20 / 290	59.7	61.6	11.9	13.3	17	271	27.7	29.6	5.8	6.4	8.4	187
30 / 435	58.7	61.0	17.3	19.0	23	293	26.7	29.1	8.4	9.4	11.5	254
40 / 580	57.6	60.5	22.7	24.8	29	340	25.6	28.5	11.3	12.2	17	298
50 / 725	56.5	60.0	28.2	30.6	34	399	24.6	28.0	13.9	15.2	17	298
60 / 870	55.7	59.4	33.5	36.3	45	562	23.8	27.5	16.6	18.1	23	362
70 / 1015	54.7	59.2	38.9	42.1	45	562	22.7	27.2	19.3	20.9	23	366
80 / 1160	53.9	58.7	44.4	47.9	56	626	21.9	26.7	22.0	23.9	29	381
90 / 1305	53.1	58.1	49.8	53.6	56	626	20.9	26.2	24.7	26.7	29	381
100 / 1450	52.3	57.9	55.1	59.4	68	869	20.1	25.9	27.5	29.6	34	415
110 / 1595	51.5	57.3	60.6	65.2	68	869	-	25.4	-	32.6	46	560
120 / 1740	50.5	56.8	66.0	70.9	83	1089	-	24.8	-	35.4	46	560

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

Viscosity > 90 SSU more power consumption.

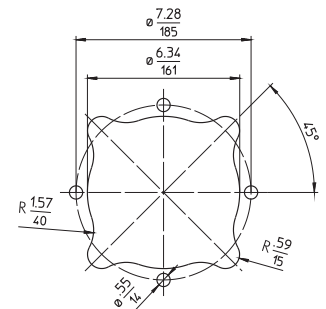
# Characteristics and dimensions

## TFS4, FFS4

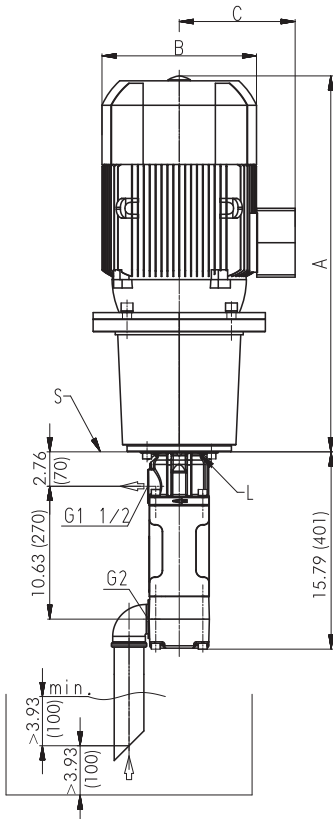
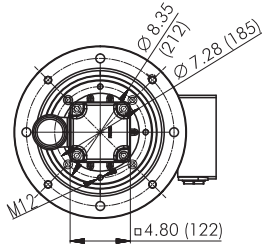
60 Hz

### Mounting hole patterns

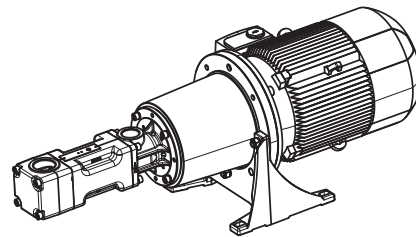
TFS3 / TFS4



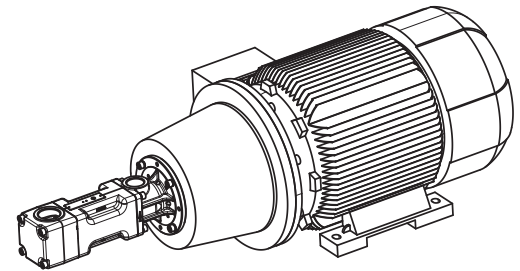
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



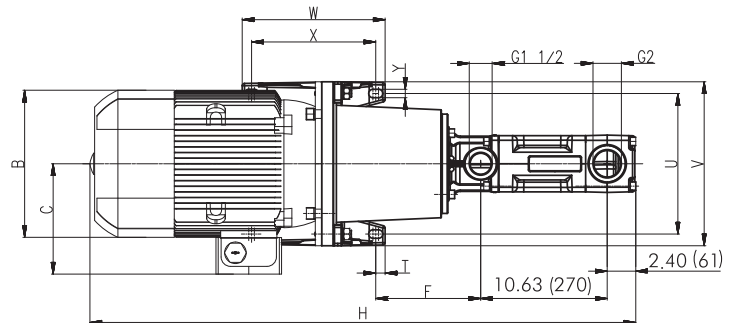
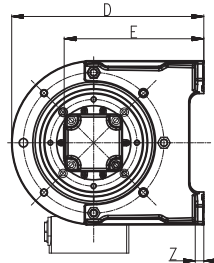
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 60 HP



≥ 60 HP



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 / 4.6	20.98	7.80	6.54	11.02	8.58	7.40	36.77	0.89	8.46	9.84	9.06	7.28	0.55	0.59
6.2	6.1	20.71	8.74	6.97	11.02	8.58	7.40	36.50	0.89	8.46	9.84	9.06	7.28	0.55	0.59
8.4	8.4	23.98	10.31	7.95	13.19	9.76	7.83	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
11.5	11.5	26.30	10.31	7.95	13.19	9.76	7.83	42.09	0.89	10.43	11.81	10.63	8.86	0.55	0.71
17 / 23	17	30.47	12.36	9.33	16.14	11.73	8.82	46.26	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	23	32.83	12.36	9.33	16.14	11.73	8.82	48.62	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29	-	32.44	12.36	9.33	16.14	11.73	8.82	48.23	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	29	32.60	14.02	11.26	16.14	11.73	8.82	48.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
34	-	32.44	14.02	11.26	16.14	11.73	8.82	48.23	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	34	33.78	14.02	11.26	16.14	11.73	8.82	49.57	0.79	11.81	13.78	12.01	10.43	0.71	0.71
45	-	34.68	15.59	12.40	18.11	12.72	8.43	50.47	0.98	13.78	15.75	13.78	11.81	0.71	0.79
56	46	35.67	15.59	12.40	18.11	12.72	8.43	51.46	0.98	13.78	15.75	13.78	11.81	0.71	0.79
68	-	38.74	17.68	13.31	17.72	11.34	19.49	54.53	0.98	14.02	17.17	14.21	12.24	0.75	1.34
83	-	41.57	19.57	16.14	20.67	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

60 Hz

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			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> 77.0</b>		-	-	-	-	<b>Q<sub>Th</sub><sup>1)</sup> 38.5</b>		-	-	-	-
10 / 145	74.0	75.3	8.3	9.4	11.5	306	35.4	36.7	3.9	4.6	6.1	232
20 / 290	72.9	74.8	14.8	16.2	23	357	34.3	36.2	7.2	8.0	11.5	318
30 / 435	71.9	74.2	21.3	23.1	29	404	33.3	35.7	10.5	11.4	17	362
40 / 580	71.1	73.7	27.8	29.8	34	463	32.5	35.4	13.7	14.9	17	362
50 / 725	70.3	73.4	34.3	36.6	45	626	31.7	34.9	16.9	18.4	23	430
60 / 870	69.2	72.9	40.9	43.4	45	626	30.9	34.3	20.2	21.7	23	430
70 / 1015	68.7	72.4	47.3	50.3	56	690	30.1	34.1	23.5	25.2	29	445
80 / 1160	67.9	72.1	53.9	57.1	68	933	29.3	33.6	26.7	28.7	34	478
90 / 1305	67.1	71.6	60.3	64.0	68	933	28.5	33.3	29.9	32.1	34	478
100 / 1450	66.6	71.3	66.9	70.7	83	1153	27.7	32.8	33.3	35.5	46	624
110 / 1595	65.8	71.1	73.4	77.5	83	1153	-	32.5	-	39.0	46	624
120 / 1740	65.3	70.5	79.9	84.4	115	1561	-	32.2	-	42.4	46	624
<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	17	335	47.8	49.9	5.1	5.8	8.4	251
20 / 290	98.8	101.2	19.3	20.9	29	404	46.8	49.1	9.5	10.5	11.5	318
30 / 435	97.8	100.7	28.2	30.3	34	463	45.7	48.6	13.9	15.2	17	362
40 / 580	96.7	100.1	37.0	39.6	45	626	44.6	48.1	18.2	19.8	23	430
50 / 725	95.6	99.6	45.7	48.8	56	690	43.6	47.6	22.7	24.5	29	445
60 / 870	94.6	99.1	54.6	58.2	68	933	42.5	47.0	27.1	29.2	34	478
70 / 1015	93.8	98.5	63.4	67.5	83	1153	41.7	46.5	31.5	33.9	46	624
80 / 1160	92.7	98.0	72.1	76.8	83	1153	40.7	46.0	35.9	38.6	46	624
90 / 1305	91.9	97.5	81.0	86.1	115	1561	39.6	45.4	40.4	43.3	46	624
100 / 1450	91.1	97.2	89.8	95.3	115	1561	38.8	45.2	44.7	48.0	57	811
110 / 1595	90.4	96.7	98.6	104.7	115	1561	-	44.6	-	52.7	57	811
120 / 1740	89.3	96.4	107.4	114.0	135	1660	-	44.4	-	57.4	70	922

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

Viscosity > 90 SSU more power consumption.

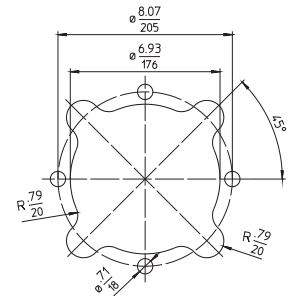
# Characteristics and dimensions

## TFS5, FFS5

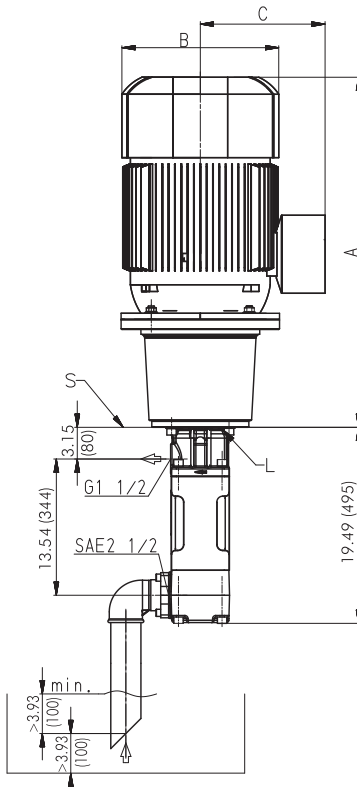
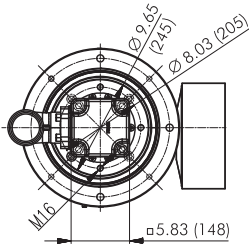
60 Hz

### Mounting hole patterns

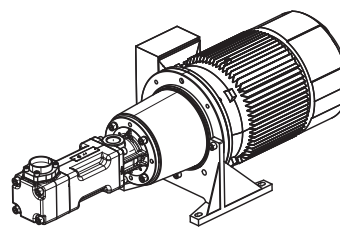
TFS5



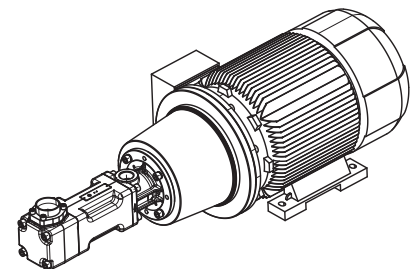
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



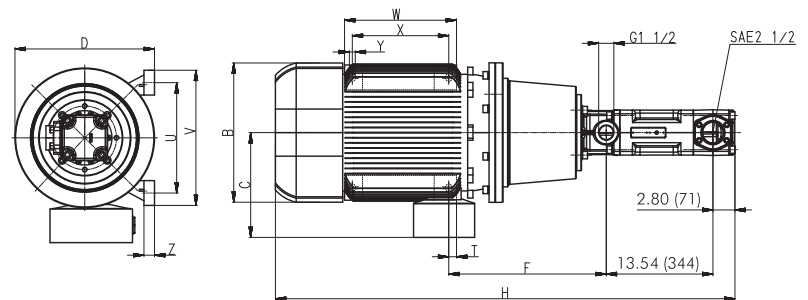
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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
–	6.1	21.89	8.74	6.97	11.02	8.98	41.38	0.89	8.46	9.84	9.06	7.28	0.55	0.59
–	8.4	24.49	10.31	7.95	13.19	8.74	43.98	0.89	10.43	11.81	10.63	8.86	0.55	0.71
11.5	11.5	26.81	10.31	7.95	13.19	8.74	46.30	0.89	10.43	11.81	10.63	8.86	0.55	0.71
17 / 23	17	30.59	12.36	9.33	16.14	9.33	50.08	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	23	32.95	12.36	9.33	16.14	9.33	52.44	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	29	32.56	12.36	9.33	16.14	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	29	32.72	14.02	11.26	16.14	9.33	52.20	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	34	32.56	14.02	11.26	16.14	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	34	33.90	14.02	11.26	16.14	9.33	53.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	45	34.80	15.59	12.40	18.11	8.94	54.29	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	56	35.79	15.59	12.40	18.11	8.94	55.28	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	57	36.57	17.68	13.31	20.47	8.78	56.06	0.98	15.75	17.72	15.16	13.19	0.71	0.79
–	68	38.86	17.68	13.31	17.72	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
–	83	41.69	19.57	16.14	20.67	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
–	115 / 135	48.94	21.69	17.05	21.85	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

60 Hz

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 3500 RPM		4-pole motor rotation speed 1750 RPM				2-pole motor rotation speed 3500 RPM		4-pole motor rotation speed 1750 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>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	17	335	57.3	60.0	5.9	6.7	8.4	251
20 / 290	118.1	121.5	22.9	24.7	29	404	55.7	58.9	11.3	12.3	17	362
30 / 435	116.8	120.7	33.4	35.8	45	626	54.2	58.1	16.5	18.0	23	430
40 / 580	115.2	119.9	44.0	47.1	56	690	52.8	57.6	21.9	23.6	29	445
50 / 725	113.9	119.4	54.6	58.3	68	933	51.5	56.8	27.1	29.2	34	478
60 / 870	112.5	118.6	65.2	69.6	83	1153	50.2	56.3	32.3	35.0	46	624
70 / 1015	111.2	118.1	75.8	80.7	83	1153	48.9	55.5	37.7	40.6	46	624
80 / 1160	110.2	117.6	86.2	92.0	115	1561	47.6	55.0	42.9	46.3	57	811
90 / 1305	108.9	117.0	96.8	103.3	115	1561	46.2	54.4	48.3	51.9	57	811
100 / 1450	107.8	116.5	107.4	114.5	135	1660	44.9	54.2	53.5	57.5	70	922
110 / 1595	106.5	116.2	118.0	125.7	135	1660	-	53.6	-	63.2	70	922
120 / 1740	105.4	115.7	128.5	136.9	165	1980	-	53.4	-	68.8	84	1109
<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	23	357	62.1	64.2	6.4	7.2	8.4	251
20 / 290	127.9	130.8	24.7	27.2	34	463	60.2	63.1	12.1	13.1	17	362
30 / 435	126.0	129.5	36.1	38.9	45	626	58.4	61.8	17.8	19.0	23	430
40 / 580	124.4	128.4	47.6	50.4	56	690	56.8	60.8	23.6	24.9	34	478
50 / 725	122.9	127.3	59.0	62.0	68	933	55.2	59.4	29.2	30.8	34	478
60 / 870	121.3	126.0	70.4	73.5	83	1153	53.6	58.4	35.0	36.6	46	624
70 / 1015	119.9	125.2	81.9	85.2	115	1561	52.3	57.3	40.8	42.5	46	624
80 / 1160	118.6	124.2	93.3	96.7	115	1561	51.0	56.5	46.5	48.4	57	800
90 / 1305	117.3	123.1	104.7	108.2	115	1561	49.4	55.5	52.2	54.3	70	922
100 / 1450	116.2	122.3	116.3	119.8	135	1660	48.1	54.7	57.9	60.2	70	922
110 / 1595	-	121.5	-	131.4	165	1980	-	53.9	-	66.1	84	1109
120 / 1740	-	120.7	-	143.0	165	1980	-	53.1	-	72.0	84	1109

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

Viscosity > 90 SSU more power consumption.



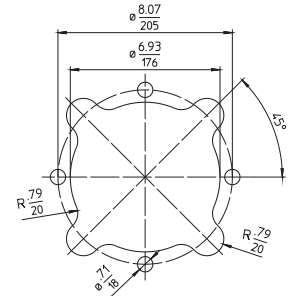
# Characteristics and dimensions

## TFS5, FFS5

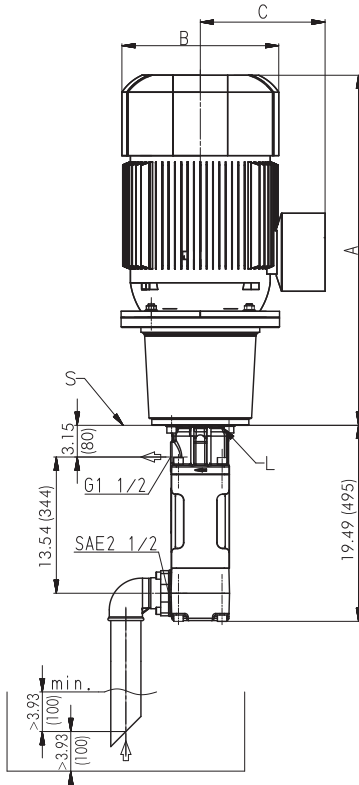
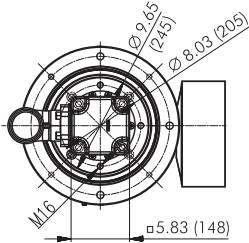
60 Hz

### Mounting hole patterns

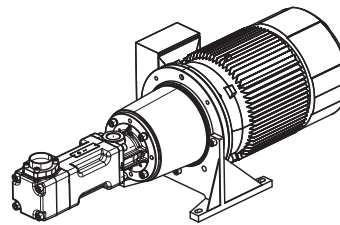
TFS5



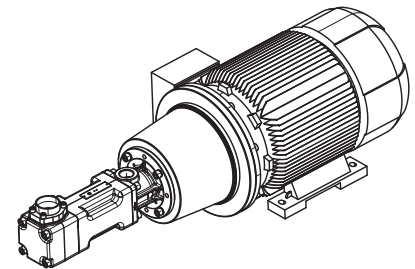
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



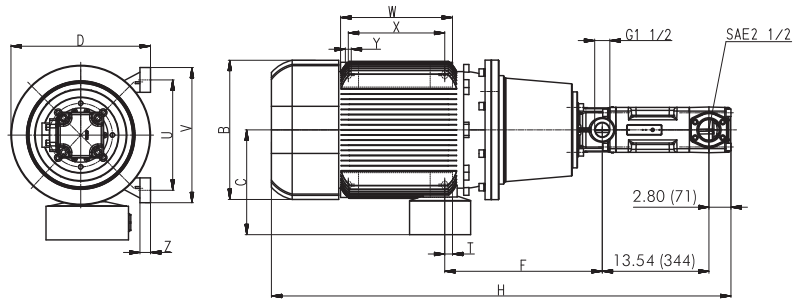
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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
–	8.4	24.49	10.31	7.95	13.19	8.74	43.98	0.89	10.43	11.81	10.63	8.86	0.55	0.71
17 / 23	17	30.59	12.36	9.33	16.14	9.33	50.08	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	23	32.95	12.36	9.33	16.14	9.33	52.44	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29	–	32.56	12.36	9.33	16.14	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	29	32.72	14.02	11.26	16.14	9.33	52.20	0.79	11.81	13.78	12.01	10.43	0.71	0.71
34	–	32.56	14.02	11.26	16.14	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	34	33.90	14.02	11.26	16.14	9.33	53.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
45	–	34.80	15.59	12.40	18.11	8.94	54.29	0.98	13.78	15.75	13.78	11.81	0.71	0.79
56	46	35.79	15.59	12.40	18.11	8.94	55.28	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	57	36.57	17.68	13.31	20.47	8.78	56.06	0.98	15.75	17.72	15.16	13.19	0.71	0.79
68	70	38.86	17.68	13.31	17.72	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
83	84	41.69	19.57	16.14	20.67	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
115 / 135	–	48.94	21.69	17.05	21.85	22.91	68.43	1.18	17.99	21.26	18.86	16.50	0.94	1.57
165	–	48.78	24.25	20.28	25.39	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

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			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> 146.4</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 73.2</b>		–	–	–	–
10 / 145	142.7	144.0	15.6	17.8	23	490	69.5	70.8	7.5	8.3	11.5	452
20 / 290	140.6	142.7	28.0	30.3	45	759	67.4	69.5	13.7	14.5	17	494
30 / 435	138.4	141.3	40.4	42.6	56	822	65.3	68.2	20.0	20.8	23	562
40 / 580	136.3	140.3	52.7	55.0	68	1067	63.1	67.1	26.1	27.0	34	611
50 / 725	134.5	139.2	65.2	67.5	83	1288	61.3	66.0	32.3	33.1	46	756
60 / 870	132.6	138.2	77.5	79.8	83	1288	59.4	65.0	38.5	39.3	46	756
70 / 1015	131.0	137.1	89.8	92.1	115	1696	57.9	63.9	44.7	45.5	57	946
80 / 1160	129.5	136.1	102.3	104.6	115	1696	56.3	62.9	50.8	51.6	57	946
<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	29	536	92.7	94.3	9.7	10.5	17	494
20 / 290	187.6	190.5	36.2	38.5	45	759	90.1	92.7	17.8	18.6	23	562
30 / 435	185.2	188.9	52.7	55.0	68	1067	87.5	91.4	26.1	27.0	29	578
40 / 580	182.8	187.6	69.2	71.5	83	1288	85.1	89.8	34.3	35.1	46	756
50 / 725	180.4	186.0	85.8	88.1	115	1696	83.0	88.5	42.6	43.4	46	756
60 / 870	178.6	184.7	102.3	104.6	115	1696	80.8	87.2	50.8	51.6	57	946
70 / 1015	176.5	183.6	118.8	121.1	135	1795	79.0	85.9	59.1	59.9	70	1056
80 / 1160	174.1	182.0	135.4	138.1	165	2115	76.6	84.5	67.3	68.1	84	1244
<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	34	595	112.0	114.1	11.3	12.1	17	494
20 / 290	226.4	229.3	43.2	45.5	56	822	108.6	111.5	21.3	22.1	29	578
30 / 435	223.2	226.9	63.0	65.3	83	1288	105.2	109.1	31.2	32.1	46	756
40 / 580	220.1	224.8	83.0	85.3	115	1696	102.0	107.0	41.3	42.1	46	756
50 / 725	217.2	223.0	103.0	105.3	115	1696	99.1	104.9	51.2	52.0	57	946
60 / 870	214.3	221.1	123.0	125.3	135	1795	96.4	103.3	61.2	62.0	70	1056
70 / 1015	211.1	219.0	143.0	145.2	165	2115	93.3	100.9	71.2	72.0	84	1244

<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.

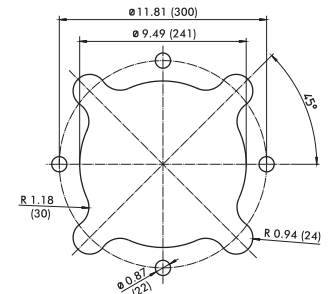
# Characteristics and dimensions

## TFS6, FFS6

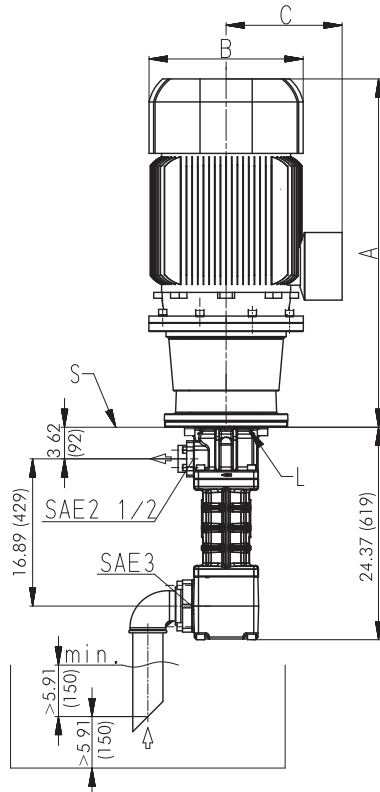
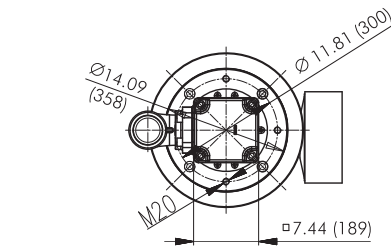
60 Hz

### Mounting hole patterns

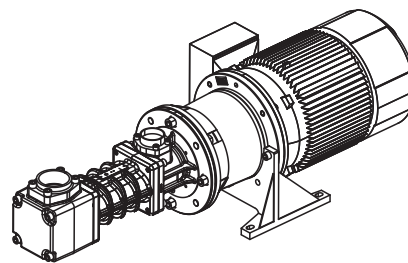
#### TFS6



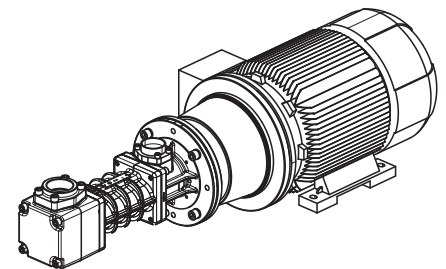
Dimensions in inches / mm  
All corners must be deburred!  
According to ISO 2768-m



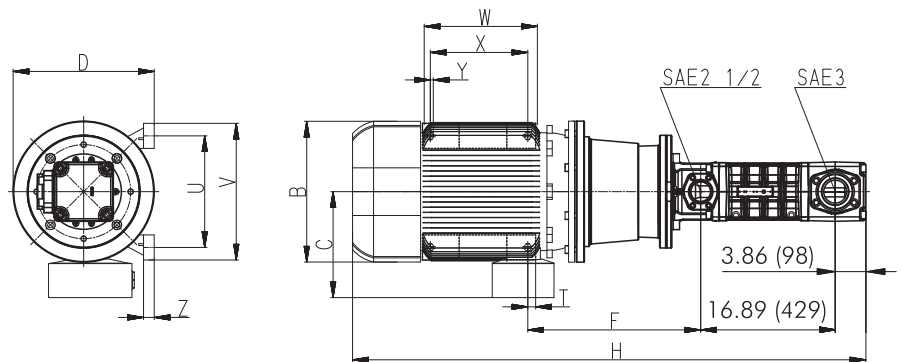
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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
–	11.5	28.46	10.31	7.95	13.19	9.92	53.19	0.89	10.43	11.81	10.63	8.86	0.55	0.71
23	17	31.69	12.36	9.33	16.14	9.92	56.06	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	23	34.06	12.36	9.33	16.14	10.43	58.43	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29	–	33.66	12.36	9.33	16.14	9.92	58.03	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	29	33.82	14.02	11.26	16.14	10.43	58.19	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	34	35.00	14.02	11.26	16.14	15.63	59.37	0.79	11.81	13.78	12.01	10.43	0.71	0.71
34	–	33.66	14.02	11.26	16.14	9.92	58.03	0.79	11.81	13.78	12.01	10.43	0.71	0.71
45	–	35.83	15.59	12.40	18.11	10.43	60.20	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	46	36.81	15.59	12.40	18.11	16.42	61.18	0.98	13.78	15.75	13.78	11.81	0.71	0.79
56	–	36.81	15.59	12.40	18.11	10.43	61.18	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	57	38.39	17.68	13.31	20.47	17.01	62.76	0.98	15.75	17.72	15.16	13.19	0.71	0.79
68	70	39.88	17.68	13.31	17.72	21.50	64.25	0.98	14.02	17.17	14.21	12.24	0.75	1.34
83	–	42.20	19.57	16.14	20.67	23.03	66.57	1.18	15.98	19.29	16.10	13.74	0.94	1.57
–	84	42.80	19.57	16.14	20.67	23.62	67.17	1.18	15.98	19.29	16.10	13.74	0.94	1.57
115 / 135	–	50.04	21.69	17.05	21.85	24.49	74.41	1.18	17.99	21.26	18.86	16.50	0.94	1.57

# High Pressure Pumps



## BFS1, FFS1

50 Hz

### Screw spindles

Pressure max.		2-pole motor rotation speed 2900 RPM						4-pole motor rotation speed 1450 RPM						
		Flow at viscosity		Power consumption of viscosity		Motor	Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
		5 SSU	90 SSU	5 SSU	90 SSU	immersion version	foot mounted version		5 SSU	90 SSU	5 SSU	90 SSU	HP	
Type / bar / PSI	GPM	GPM	HP	HP	HP	HP	Lbs	GPM	GPM	HP	HP	HP	Lbs	
<b>BFS130/</b>		Q <sub>Th</sub> <sup>1)</sup> 4.1		-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 2.1		-	-	-	-
10 / 145	3.7	4.0	0.7	0.7	B 1.75	1	86	1.6	1.9	0.3	0.3	1	64	
20 / 290	3.5	3.9	1.1	1.1	B 1.75	1.5	86	1.4	1.8	0.5	0.5	1	64	
30 / 435	3.2	3.8	1.3	1.3	B 1.75	2.2	86	1.1	1.7	0.7	0.7	1	64	
40 / 580	3.0	3.7	1.7	1.7	B 2	2.2	86	0.9	1.6	0.8	0.9	1.5	68	
50 / 725	2.7	3.6	2.0	2.1	B 2.3	3	86	-	1.5	-	1.1	1.5	68	
60 / 870	2.5	3.5	2.4	2.5	B 2.5	3	95	-	1.4	-	1.2	1.5	68	
70 / 1015	2.3	3.4	2.8	2.8	B 3	4	95	-	1.3	-	1.5	2.2	75	
80 / 1160	2.1	3.3	3.1	3.2	B 3.5	4	97	-	1.2	-	1.6	2.2	75	
90 / 1305	1.9	3.2	3.5	3.6	B 4.4	4	119	-	1.1	-	1.7	2.2	75	
100 / 1450	1.7	3.1	3.8	3.9	B 4.4	5.4	119	-	1.1	-	2.0	3	90	
110 / 1595	1.5	3.0	4.2	4.3	B 4.4	5.4	119	-	-	-	-	-	-	
120 / 1740	1.3	3.0	4.6	4.7	B 5.4	5.4	126	-	-	-	-	-	-	
130 / 1885	-	2.9	-	5.1	B 5.4	5.4	126	-	-	-	-	-	-	
140 / 2030	-	2.8	-	5.4	B 5.4	7.4	126	-	-	-	-	-	-	
150 / 2175	-	2.7	-	5.8	B 6.7	7.4	161	-	-	-	-	-	-	
<b>BFS140/</b>		Q <sub>Th</sub> <sup>1)</sup> 5.5		-	-	-	-	-	Q <sub>Th</sub> <sup>1)</sup> 2.8		-	-	-	-
10 / 145	5.0	5.3	0.8	0.9	B 1.75	1.5	86	2.2	2.5	0.4	0.4	1	64	
20 / 290	4.6	5.2	1.2	1.3	B 1.75	2.2	86	1.9	2.4	0.5	0.7	1	64	
30 / 435	4.3	5.0	1.7	1.9	B 2	2.2	86	1.5	2.3	0.8	0.9	1.5	68	
40 / 580	4.0	4.9	2.1	2.3	B 2.5	3	95	1.2	2.1	1.1	1.2	1.5	68	
50 / 725	3.7	4.8	2.7	2.8	B 3	4	95	1.0	2.0	1.3	1.5	2.2	75	
60 / 870	3.4	4.6	3.1	3.4	B 3.5	4	97	0.7	1.9	1.5	1.7	2.2	75	
70 / 1015	3.2	4.5	3.6	3.8	B 4.4	4	119	-	1.7	-	1.9	3	90	
80 / 1160	2.9	4.4	4.0	4.3	B 4.4	5.4	119	-	1.6	-	2.1	3	90	
90 / 1305	2.7	4.3	4.6	4.7	B 5.4	5.4	126	-	1.5	-	2.4	3	90	
100 / 1450	2.5	4.1	5.0	5.2	B 5.4	7.4	126	-	1.4	-	2.7	3	90	
110 / 1595	2.2	4.0	5.5	5.8	B 6.7	7.4	161	-	-	-	-	-	-	
120 / 1740	1.9	3.9	5.9	6.2	B 6.7	7.4	161	-	-	-	-	-	-	
130 / 1885	1.7	3.8	6.4	6.7	B 6.7	7.4	161	-	-	-	-	-	-	
140 / 2030	-	3.7	-	7.1	B 7.4	7.4	161	-	-	-	-	-	-	
150 / 2175	-	3.6	-	7.6	B 10	10	207	-	-	-	-	-	-	

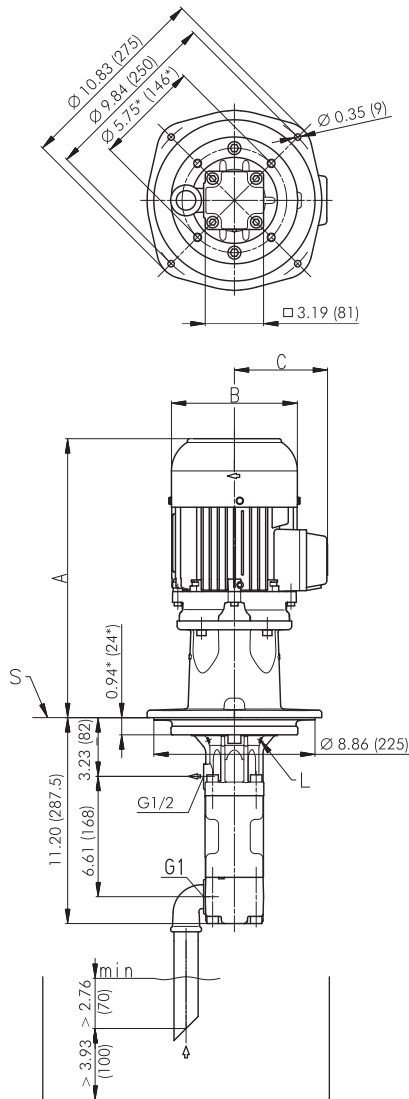
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

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

# Characteristics and dimensions

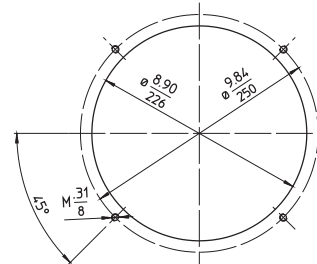
## BFS1, FFS1

50 Hz

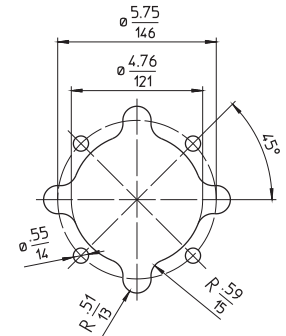


### Mounting hole patterns

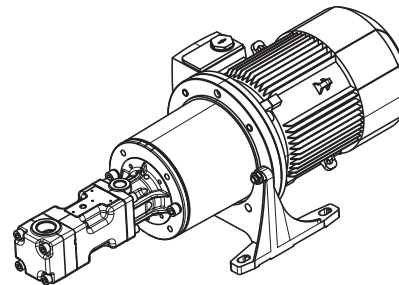
#### BFS1 / BFS2



#### TFS1 / TFS2



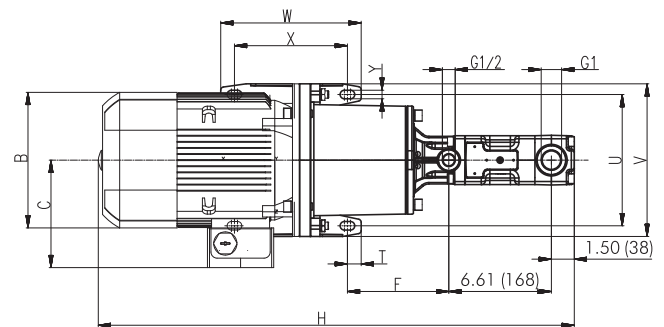
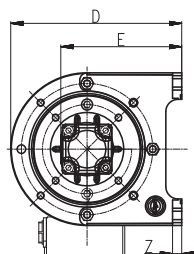
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 1.75 / 2 / 2.3	15.31	6.93	5.12
B 2.5 / 3	16.30	6.93	5.12
B 3.5	16.69	6.93	5.12
B 4.4 / 5.4	18.82	8.58	5.91
B 6.7 / 7.4	20.24	10.16	7.48
B 10	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 / 1.5	1	6.26	4.76	8.35	6.10	5.43	26.61	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2.2	1.5 / 2.2	7.01	4.96	8.35	6.10	5.43	28.39	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	—	7.09	4.96	8.35	6.10	5.43	28.39	0.59	7.09	8.27	3.54	2.36	0.43	0.47
—	3	7.80	6.54	11.02	7.80	6.54	30.94	0.89	8.46	9.84	10.24	7.28	0.55	0.59
4	—	7.80	6.54	11.02	7.80	6.54	30.94	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5.4	—	8.74	6.97	11.02	7.80	6.54	30.71	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.4	—	10.31	7.95	13.19	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	13.19	8.98	6.73	36.02	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.		2-pole motor rotation speed 2900 RPM						4-pole motor rotation speed 1450 RPM						
		Flow at viscosity		Power consumption of viscosity		Motor	Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
		5 SSU	90 SSU	5 SSU	90 SSU	immersion version	foot mounted version		5 SSU	90 SSU	5 SSU	90 SSU	HP	
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 1.75	1.5	88	3.0	3.3	0.4	0.7	1	64	
20 / 290	6.2	6.7	1.5	1.7	B 2	2.2	88	2.8	3.2	0.8	0.9	1.5	71	
30 / 435	6.1	6.6	2.0	2.3	B 2.5	3	97	2.6	3.1	1.1	1.2	1.5	71	
40 / 580	5.9	6.5	2.7	3.0	B 3.5	4	97	2.5	3.1	1.3	1.6	2.2	75	
50 / 725	5.8	6.4	3.2	3.6	B 4.4	4	121	2.3	3.0	1.6	1.9	3	90	
60 / 870	5.6	6.4	3.8	4.2	B 4.4	5.4	121	2.2	2.9	1.9	2.1	3	90	
70 / 1015	5.4	6.3	4.4	4.8	B 5.4	5.4	126	2.0	2.9	2.3	2.5	3	90	
80 / 1160	5.3	6.2	5.0	5.4	B 5.4	7.4	126	1.8	2.8	2.5	2.8	4	101	
90 / 1305	5.2	6.2	5.5	6.0	B 6.7	7.4	163	1.7	2.7	2.8	3.1	4	101	
100 / 1450	5.0	6.1	6.2	6.6	B 6.7	7.4	163	1.5	2.6	3.1	3.4	4	101	
110 / 1595	4.9	6.1	6.7	7.2	B 7.4	10	163	–	–	–	–	–	–	
120 / 1740	4.7	6.0	7.4	7.8	B 10	10	209	–	–	–	–	–	–	
130 / 1885	4.6	5.9	7.9	8.4	B 10	10	209	–	–	–	–	–	–	
140 / 2030	4.4	5.8	8.4	9.0	B 10	10	209	–	–	–	–	–	–	
150 / 2175	4.3	5.8	9.1	9.7	B 10	10	209	–	–	–	–	–	–	
<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 1.75	1.5	88	3.5	3.9	0.5	0.5	1	64	
20 / 290	7.4	7.9	1.7	1.7	B 2	2.2	88	3.3	3.8	0.8	0.8	1.5	71	
30 / 435	7.2	7.8	2.4	2.4	B 2.5	3	97	3.1	3.7	1.2	1.2	1.5	71	
40 / 580	7.1	7.7	3.1	3.2	B 3.5	4	97	3.0	3.6	1.6	1.6	2.2	75	
50 / 725	6.9	7.6	3.8	3.9	B 4.4	5.4	121	2.8	3.5	1.9	2.0	3	90	
60 / 870	6.7	7.6	4.4	4.7	B 5.4	5.4	126	2.6	3.5	2.3	2.4	3	90	
70 / 1015	6.5	7.5	5.1	5.4	B 5.4	7.4	126	2.4	3.4	2.5	2.7	3	90	
80 / 1160	6.3	7.4	5.9	6.0	B 6.7	7.4	163	2.2	3.3	3.0	3.1	4	101	
90 / 1305	6.1	7.3	6.6	6.8	B 7.4	7.4	163	2.0	3.2	3.4	3.5	4	101	
100 / 1450	5.9	7.3	7.2	7.5	B 10	10	209	1.8	3.2	3.6	3.9	5.4	117	
110 / 1595	5.8	7.2	7.9	8.3	B 10	10	209	–	–	–	–	–	–	
120 / 1740	5.6	7.1	8.6	9.1	B 10	10	209	–	–	–	–	–	–	
130 / 1885	5.4	7.1	9.3	9.8	B 12	15	223	–	–	–	–	–	–	
140 / 2030	5.3	7.0	10.1	10.6	B 12	15	223	–	–	–	–	–	–	
150 / 2175	5.1	6.9	10.7	11.3	B 12	15	223	–	–	–	–	–	–	

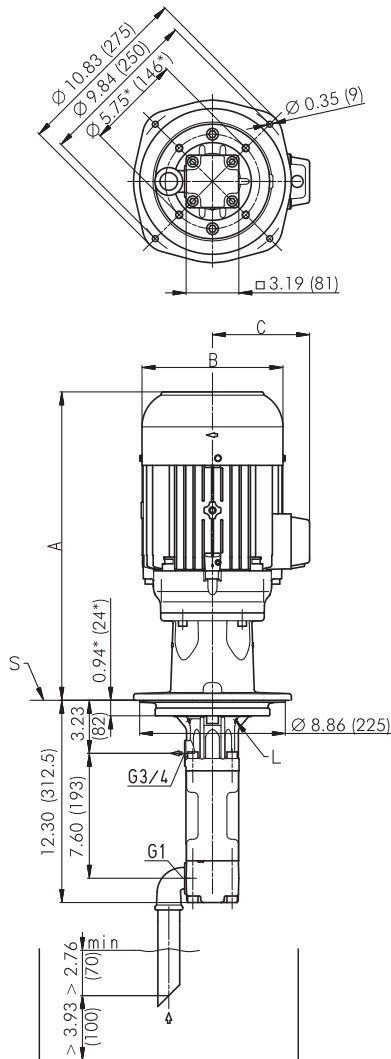
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

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

# Characteristics and dimensions

## BFS2, FFS2

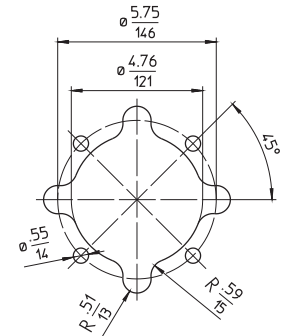
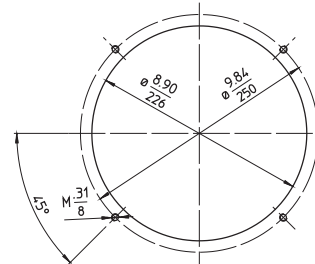
50 Hz



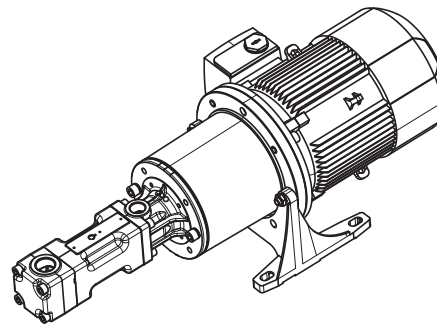
### Mounting hole patterns

BFS1 / BFS2

TFS1 / TFS2

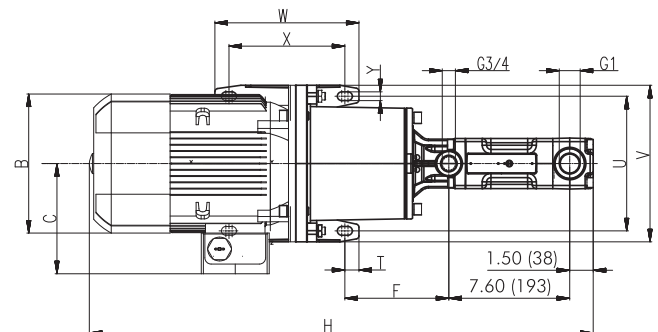
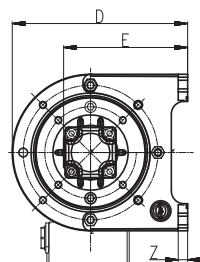


Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 1.75 / 2	15.31	6.93	5.12
B 2.5	16.30	6.93	5.12
B 3.5	16.69	6.93	5.12
B 4.4 / 5.4	18.82	8.58	5.91
B 6.7 / 7.4	20.24	10.16	7.48
B 10 / 12	24.49	10.16	7.60

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
1.5	1	6.26	4.76	8.35	6.10	5.43	27.60	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2.2	1.5 / 2.2	7.01	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	—	7.09	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
—	3 / 4	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
4	—	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
5.4	—	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
—	5.4	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
7.4	—	10.31	7.95	13.19	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	13.19	8.98	6.73	37.01	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15	—	12.36	9.33	16.14	10.94	8.27	41.77	0.79	11.81	13.78	12.01	10.43	0.71	0.71

# High Pressure Pumps



## BFS2, FFS2

50 Hz

### Screw spindles

2-pole motor rotation speed 2900 RPM								4-pole motor rotation speed 1450 RPM					
Pressure max.	Flow at viscosity		Power consumption of viscosity		Motor	Motor	Weight	Flow at viscosity		Power consumption of viscosity		Motor	Weight
	5 SSU	90 SSU	5 SSU	90 SSU	immersion version	foot mounted version		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 1.75	1.5	88	4.6	5.1	0.7	0.7	1	64
20 / 290	9.8	10.4	2.1	2.1	B 2.3	3	88	4.4	5.0	1.1	1.1	1.5	71
30 / 435	9.5	10.3	3.1	3.1	B 3.5	4	97	4.1	4.9	1.6	1.6	2.2	75
40 / 580	9.3	10.2	4.0	4.2	B 4.4	5.4	97	3.9	4.8	2.0	2.1	3	90
50 / 725	9.1	10.1	4.8	5.1	B 5.4	5.4	126	3.7	4.7	2.4	2.5	3	90
60 / 870	8.9	10.0	5.8	6.0	B 6.7	7.4	163	3.5	4.6	3.0	3.1	4	101
70 / 1015	8.6	9.9	6.7	7.0	B 7.4	7.4	163	3.2	4.5	3.4	3.5	4	101
80 / 1160	8.4	9.8	7.6	7.9	B 10	10	209	3.0	4.4	3.9	4.0	5.4	117
90 / 1305	8.2	9.7	8.6	8.9	B 10	10	209	2.8	4.3	4.3	4.4	5.4	117
100 / 1450	8.1	9.6	9.4	9.9	B 12	15	223	2.6	4.2	4.7	5.0	5.4	117
110 / 1595	7.7	9.5	10.3	10.9	B 12	15	223	–	–	–	–	–	–
120 / 1740	7.4	9.4	11.3	11.8	B 15	15	265	–	–	–	–	–	–
130 / 1885	7.0	9.3	12.2	12.7	B 15	15	265	–	–	–	–	–	–
140 / 2030	6.7	9.2	13.1	13.7	B 15	15	265	–	–	–	–	–	–
150 / 2175	6.4	9.1	13.9	14.8	B 17.5	20	265	–	–	–	–	–	–
<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	2.2	88	5.5	6.1	0.7	0.8	1	64
20 / 290	11.7	12.4	2.5	2.7	B 3	4	97	5.3	5.9	1.2	1.3	2.2	75
30 / 435	11.4	12.2	3.6	3.9	B 4.4	5.4	97	4.9	5.8	1.9	1.9	3	90
40 / 580	11.1	12.1	4.7	5.1	B 5.4	7.4	126	4.6	5.6	2.4	2.5	3	90
50 / 725	10.8	11.9	5.8	6.2	B 6.7	7.4	163	4.3	5.5	3.0	3.1	4	101
60 / 870	10.5	11.8	6.8	7.4	B 10	10	209	4.0	5.3	3.5	3.8	4	101
70 / 1015	10.2	11.6	7.9	8.6	B 10	10	209	3.7	5.1	4.0	4.3	5.4	117
80 / 1160	9.9	11.4	9.1	9.8	B 12	15	223	3.4	5.0	4.6	5.0	5.4	117
90 / 1305	9.6	11.3	10.2	10.9	B 12	15	223	3.1	4.8	5.1	5.5	7.4	139
100 / 1450	9.2	11.1	11.4	12.1	B 15	15	265	2.8	4.6	5.8	6.0	7.4	139
110 / 1595	8.8	10.9	12.5	13.3	B 15	15	265	–	–	–	–	–	–
120 / 1740	8.4	10.8	13.4	14.5	B 15	15	265	–	–	–	–	–	–
130 / 1885	8.0	10.4	14.6	15.7	B 17.5	20	265	–	–	–	–	–	–
140 / 2030	7.5	10.1	15.7	16.8	B 17.5	20	265	–	–	–	–	–	–
150 / 2175	7.1	9.8	16.8	18.0	–	20	243	–	–	–	–	–	–

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

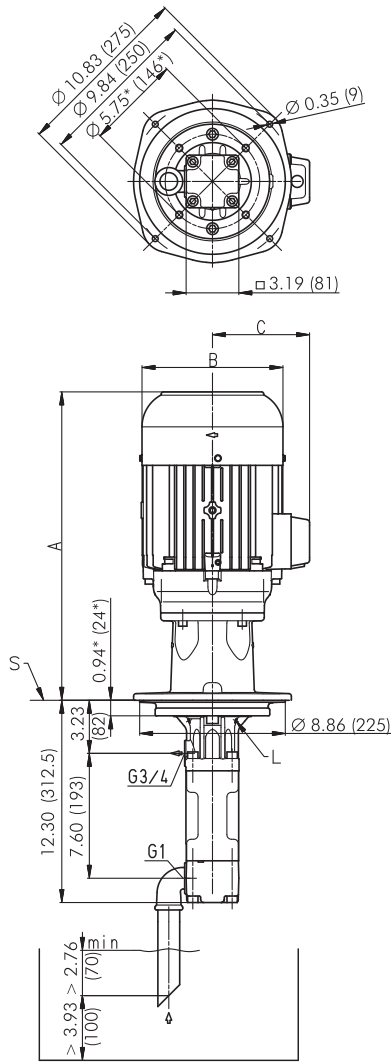
Higher pressure for water soluble coolants (up to 2900 psi / 200 bar) upon request.



# Characteristics and dimensions

## BFS2, FFS2

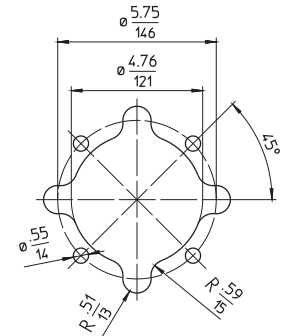
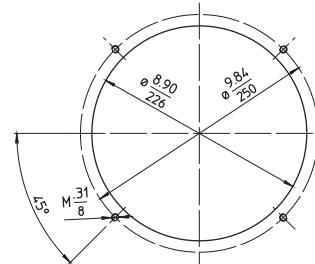
50 Hz



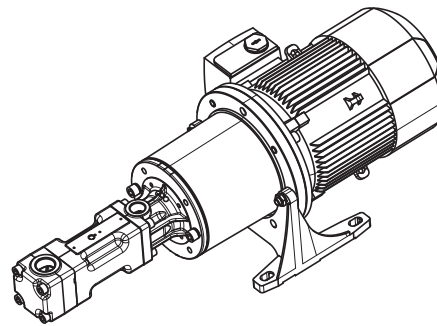
### Mounting hole patterns

BFS1 / BFS2

TFS1 / TFS2

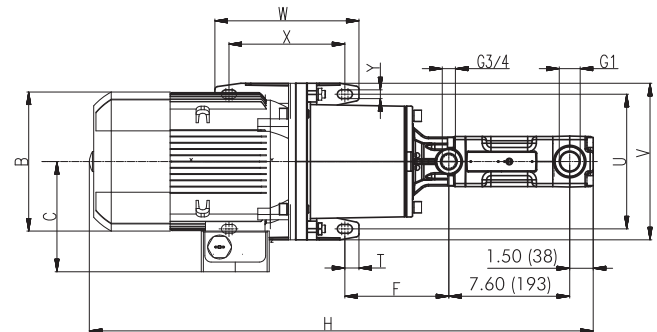
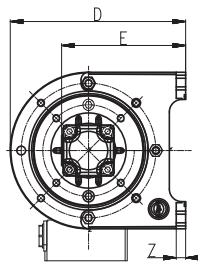


Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



\*) 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 1.75 / 2 / 2.3	15.31	6.93	5.12
B 3	16.30	6.93	5.12
B 3.5	16.69	6.93	5.12
B 4.4 / 5.4	18.82	8.58	5.91
B 6.7 / 7.4	20.24	10.16	7.48
B 10 / 12	24.49	10.16	7.60
B 15 / 17.5	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
1.5	1	6.26	4.76	8.35	6.10	5.43	27.60	0.59	7.09	8.27	3.54	2.36	0.43	0.47
2.2	1.5 / 2.2	7.01	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	-	7.09	4.96	8.35	6.10	5.43	29.37	0.59	7.09	8.27	3.54	2.36	0.43	0.47
-	3 / 4	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
4	-	7.80	6.54	11.02	7.80	6.54	31.93	0.89	8.46	9.84	10.24	7.28	0.55	0.59
5.4	-	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
-	5.4	8.74	6.97	11.02	7.80	6.54	31.69	0.89	8.46	9.84	10.24	7.28	0.55	0.59
7.4	7.4	10.31	7.95	13.19	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	13.19	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	16.14	10.94	8.27	41.77	0.79	11.81	13.78	12.01	10.43	0.71	0.71

# High Pressure Pumps



## TFS3, FFS3

50 Hz

Screw spindles

Pressure max.  Type / bar / PSI	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	HP		5 SSU	90 SSU	5 SSU	90 SSU	HP	
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	139	7.0	7.8	1.6	1.7	2.2	101
30 / 435	15.1	16.0	4.8	5.2	7.4	161	6.6	7.6	2.4	2.5	3	117
40 / 580	14.7	15.8	6.3	6.8	7.4	161	6.2	7.4	3.1	3.2	4	128
50 / 725	14.4	15.6	7.6	8.3	10	220	5.9	7.2	3.8	4.0	5.4	143
60 / 870	14.0	15.5	9.1	9.8	15	247	5.6	7.0	4.6	4.7	5.4	143
70 / 1015	13.7	15.3	10.6	11.4	15	247	5.2	6.8	5.2	5.5	7.4	165
80 / 1160	13.4	15.1	11.9	12.9	15	247	4.9	6.7	5.9	6.3	7.4	165
90 / 1305	13.1	15.0	13.4	14.3	20	269	4.6	6.5	6.7	7.0	7.4	165
100 / 1450	12.8	14.8	14.9	15.8	20	269	4.3	6.4	7.4	7.8	10	232
110 / 1595	12.3	14.7	16.2	17.4	20	269	–	–	–	–	–	–
120 / 1740	11.9	14.6	17.7	19.0	20	269	–	–	–	–	–	–
130 / 1885	11.4	14.5	19.2	20.5	25	315	–	–	–	–	–	–
140 / 2030	11.0	14.4	20.5	22.0	25	315	–	–	–	–	–	–
150 / 2175	10.6	14.3	22.0	23.6	25	315	–	–	–	–	–	–
<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	115	9.8	10.6	1.2	1.2	2.2	101
20 / 290	20.6	21.7	4.4	4.7	7.4	161	9.3	10.4	2.1	2.3	3	117
30 / 435	20.2	21.4	6.3	6.7	10	220	8.9	10.1	3.1	3.2	4	128
40 / 580	19.7	21.2	8.2	8.7	10	220	8.4	9.9	4.0	4.3	5.4	143
50 / 725	19.3	20.9	10.1	10.7	15	247	8.0	9.6	5.0	5.2	7.4	165
60 / 870	18.9	20.7	12.1	12.7	15	247	7.6	9.4	5.9	6.3	7.4	165
70 / 1015	18.5	20.5	13.9	14.6	20	269	7.2	9.2	6.8	7.2	10	232
80 / 1160	18.1	20.3	15.8	16.6	20	269	6.8	9.0	7.9	8.2	10	232
90 / 1305	17.7	20.1	17.7	18.6	20	269	6.3	8.8	8.9	9.3	10	232
100 / 1450	17.3	19.9	19.7	20.7	25	315	5.9	8.6	9.8	10.2	15	273
110 / 1595	16.7	19.8	21.6	22.7	25	315	–	–	–	–	–	–
120 / 1740	16.1	19.6	23.5	24.7	29.5	375	–	–	–	–	–	–
130 / 1885	15.5	19.2	25.3	26.7	29.5	375	–	–	–	–	–	–
140 / 2030	15.0	18.8	27.4	28.7	29.5	375	–	–	–	–	–	–
150 / 2175	14.4	18.4	29.2	30.6	40	538	–	–	–	–	–	–
<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	139	11.8	12.6	1.3	1.6	3	117
20 / 290	24.6	25.7	5.1	5.6	7.4	161	11.2	12.3	2.4	2.8	4	128
30 / 435	24.0	25.4	7.4	8.0	10	220	10.6	12.0	3.6	4.0	5.4	143
40 / 580	23.5	25.1	9.7	10.6	15	247	10.1	11.7	4.7	5.2	7.4	165
50 / 725	23.0	24.9	11.9	13.0	15	247	9.6	11.4	5.9	6.4	7.4	165
60 / 870	22.5	24.6	14.2	15.4	20	269	9.1	11.2	7.0	7.6	10	232
70 / 1015	22.0	24.4	16.4	17.8	20	269	8.5	10.9	8.2	8.9	10	232
80 / 1160	21.5	24.1	18.6	20.2	25	315	8.0	10.7	9.3	9.9	15	273
90 / 1305	21.0	23.9	20.9	22.7	25	315	7.5	10.5	10.5	11.3	15	273
100 / 1450	20.5	23.7	23.2	25.2	29.5	375	7.0	10.3	11.5	12.3	15	273
110 / 1595	19.7	23.5	25.5	27.6	29.5	375	–	–	–	–	–	–
120 / 1740	18.9	23.3	27.8	30.0	40	538	–	–	–	–	–	–
130 / 1885	18.2	22.8	30.0	32.5	40	538	–	–	–	–	–	–
140 / 2030	17.4	22.4	32.2	34.9	40	538	–	–	–	–	–	–
150 / 2175	16.7	21.9	34.5	37.4	40	538	–	–	–	–	–	–

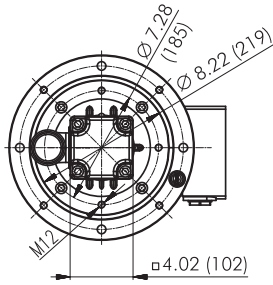
<sup>1)</sup> Q<sub>Th</sub>: Theoretical flow rate ; Viscosity > 90 SSU more power consumption.

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

# Characteristics and dimensions

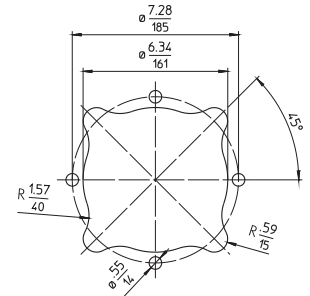
## TFS3, FFS3

### 50 Hz

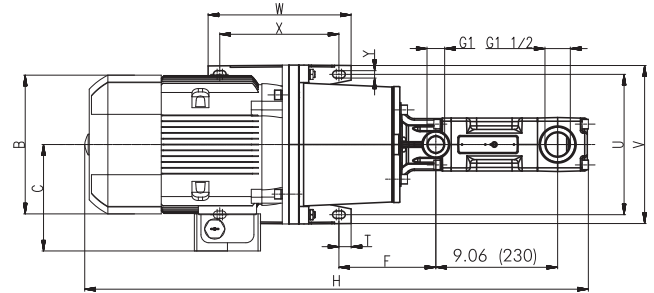
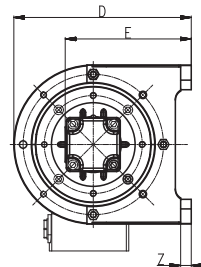
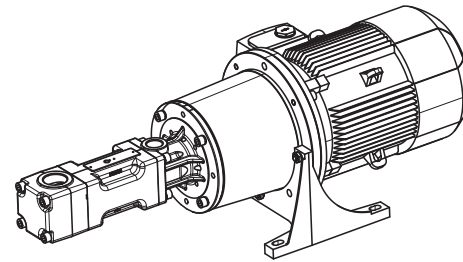
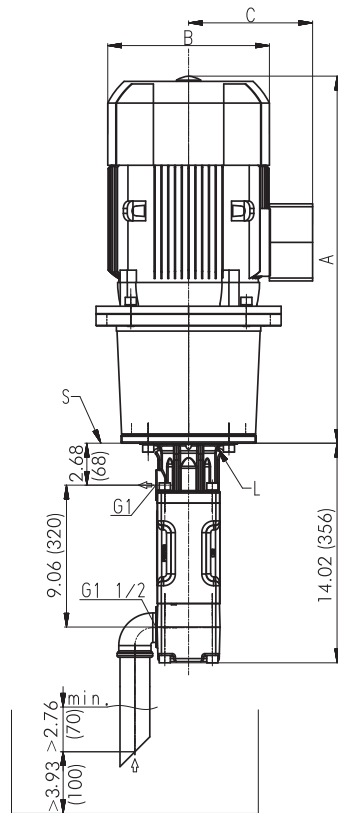


Mounting hole patterns

TFS3 / TFS4



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



L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mountig 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	18.74	7.01	4.96	8.35	6.50	5.98	32.76	0.59	7.09	8.27	3.54	2.36	0.43	0.47
–	2.2	20.98	7.01	4.96	8.35	6.50	5.98	32.76	0.59	7.09	8.27	3.54	2.36	0.43	0.47
3	–	18.74	7.09	4.96	8.35	6.50	5.98	32.76	0.59	7.09	8.27	3.54	2.36	0.43	0.47
–	3	20.71	7.80	6.54	11.02	8.19	7.32	35.00	0.89	8.46	9.84	10.24	7.28	0.55	0.59
4	–	20.98	7.80	6.54	11.02	8.19	7.32	35.00	0.89	8.46	9.84	9.06	7.28	0.55	0.59
–	4	23.43	7.80	6.54	11.02	8.19	7.32	35.00	0.89	8.46	9.84	10.24	7.28	0.55	0.59
5.4	–	20.71	8.74	6.97	11.02	8.19	7.32	34.72	0.89	8.46	9.84	9.06	7.28	0.55	0.59
–	5.4	23.43	8.74	6.97	11.02	8.19	7.32	34.72	0.89	8.46	9.84	10.24	7.28	0.55	0.59
7.4	–	23.43	10.31	7.95	13.19	9.37	7.20	37.44	0.89	10.43	11.81	10.63	8.86	0.55	0.71
–	7.4	30.08	10.31	7.95	13.19	9.37	7.20	37.44	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	–	25.75	10.31	7.95	13.19	9.37	7.20	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
–	10	30.47	10.31	7.95	13.19	9.37	7.20	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	–	30.47	12.36	9.33	16.14	11.34	8.74	44.49	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	15	32.44	12.36	9.33	16.14	11.34	8.74	44.49	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	–	32.44	12.36	9.33	16.14	11.34	8.74	46.46	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29.5	–	32.44	14.02	11.26	16.14	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	18.11	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	163	14.5	15.6	1.6	1.7	3	141
20 / 290	30.4	31.7	6.4	7.0	10	243	13.7	15.1	3.1	3.2	4	141
30 / 435	29.6	31.2	9.3	9.9	15	271	13.2	14.8	4.4	4.7	5.4	168
40 / 580	29.1	30.9	12.1	12.9	15	271	12.4	14.3	5.9	6.3	7.4	187
50 / 725	28.3	30.6	14.8	15.8	20	293	11.6	14.0	7.2	7.8	10	254
60 / 870	27.7	30.1	17.6	18.8	20	293	11.1	13.7	8.7	9.3	10	254
70 / 1015	26.9	29.9	20.4	21.6	25	340	10.6	13.2	10.1	10.7	15	298
80 / 1160	26.4	29.6	23.2	24.5	29.5	399	9.8	12.9	11.5	12.2	15	298
90 / 1305	25.9	29.3	26.0	27.5	29.5	399	9.2	12.7	12.9	13.8	15	298
100 / 1450	25.4	29.1	28.8	30.4	40	562	8.5	12.4	14.3	15.2	20	366
110 / 1595	24.8	28.8	31.6	33.4	40	562	–	–	–	–	–	–
120 / 1740	24.0	28.5	34.3	36.3	40	562	–	–	–	–	–	–
<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	7.4	183	19.6	20.9	2.1	2.4	3	141
20 / 290	40.4	42.3	8.3	8.9	10	243	18.5	20.1	4.0	4.3	5.4	168
30 / 435	39.6	41.7	12.1	12.7	15	271	17.4	19.6	5.9	6.3	7.4	187
40 / 580	38.6	41.2	15.7	16.6	20	293	16.6	19.0	7.8	8.2	10	254
50 / 725	37.8	40.7	19.4	20.4	25	340	15.9	18.5	9.7	10.2	15	298
60 / 870	37.0	40.2	23.2	24.3	29.5	399	14.8	18.0	11.5	12.3	15	298
70 / 1015	36.2	39.6	27.0	28.2	29.5	399	14.0	17.7	13.3	14.2	15	298
80 / 1160	35.4	39.4	30.7	32.1	40	562	13.5	17.2	15.2	16.2	20	366
90 / 1305	34.9	38.8	34.5	35.8	40	562	12.4	16.9	17.0	18.2	20	366
100 / 1450	34.1	38.6	38.2	39.7	40	562	11.6	16.6	18.9	20.1	25	381
110 / 1595	33.3	38.3	42.0	43.6	50	626	–	–	–	–	–	–
120 / 1740	32.8	38.0	45.6	47.5	50	626	–	–	–	–	–	–
<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	7.4	183	23.5	24.8	2.5	2.8	4	141
20 / 290	48.9	50.7	9.8	10.7	15	271	22.5	24.3	4.7	5.2	7.4	187
30 / 435	47.8	50.2	14.2	15.4	20	293	21.1	23.8	7.0	7.6	10	254
40 / 580	46.8	49.7	18.8	20.2	25	340	20.1	23.2	9.3	10.1	15	298
50 / 725	45.7	49.1	23.2	24.9	29.5	399	19.0	22.7	11.5	12.5	15	298
60 / 870	44.6	48.6	27.8	29.8	40	562	18.2	22.2	13.7	14.9	20	366
70 / 1015	43.9	48.1	32.2	34.5	40	562	17.2	21.7	16.0	17.3	20	366
80 / 1160	42.8	47.6	36.6	39.3	50	626	16.4	21.1	18.2	19.8	25	381
90 / 1305	42.0	47.3	41.2	44.0	50	626	15.3	20.6	20.5	22.3	25	381
100 / 1450	41.2	46.8	45.6	48.8	60	869	14.5	20.3	22.7	24.7	29.5	415
110 / 1595	40.4	46.5	50.2	53.5	60	869	–	–	–	–	–	–
120 / 1740	39.4	46.0	54.6	58.3	60	869	–	–	–	–	–	–

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

Viscosity > 90 SSU more power consumption.

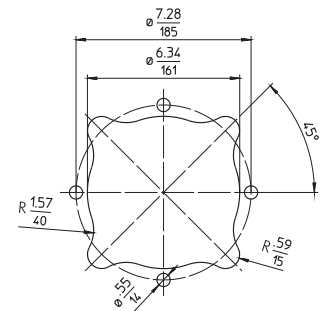
# Characteristics and dimensions

## TFS4, FFS4

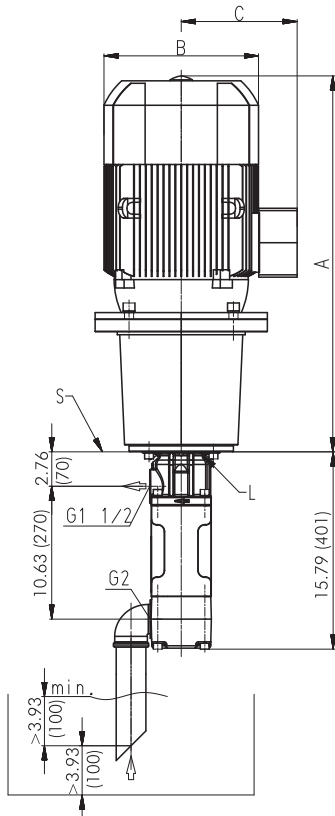
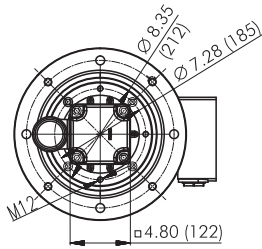
### 50 Hz

#### Mounting hole patterns

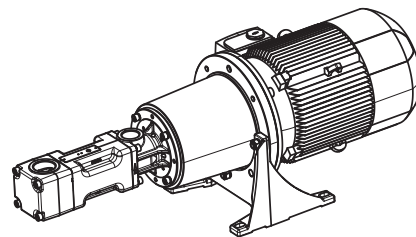
#### TFS3 / TFS4



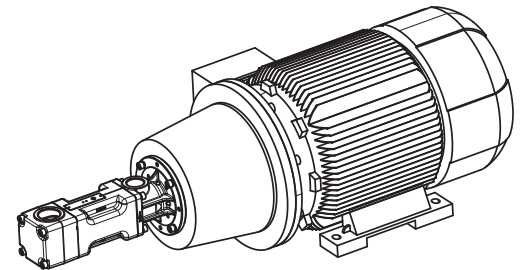
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



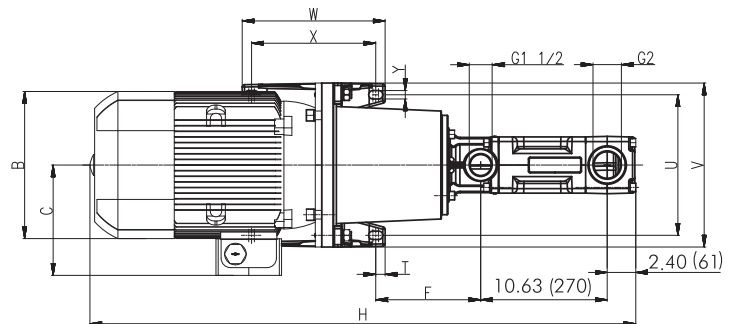
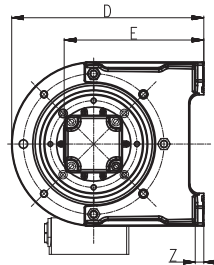
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 60 HP



≥ 60 HP



Power 2-poles HP	Power 4-poles HP	A	B	C	D	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	20.98	7.80	6.54	11.02	8.58	7.40	36.77	0.89	8.46	9.84	9.06	7.28	0.55	0.59
5.4	5.4	20.71	8.74	6.97	11.02	8.58	7.40	36.50	0.89	8.46	9.84	9.06	7.28	0.55	0.59
7.4	7.4	23.98	10.31	7.95	13.19	9.76	7.83	39.76	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	10	26.30	10.31	7.95	13.19	9.76	7.83	42.09	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.47	12.36	9.33	16.14	11.73	8.82	46.26	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	20	32.83	12.36	9.33	16.14	11.73	8.82	48.62	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	-	32.44	12.36	9.33	16.14	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	16.14	11.73	8.82	48.39	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29.5	-	32.44	14.02	11.26	16.14	11.73	8.82	48.23	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	29.5	33.78	14.02	11.26	16.14	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	18.11	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	18.11	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	17.72	11.34	19.49	54.61	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				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	306	28.8	30.1	3.1	3.6	5.4	232
20 / 290	59.7	61.6	12.2	13.3	20	357	27.7	29.6	5.8	6.4	7.4	251
30 / 435	58.7	61.0	17.6	19.0	25	404	26.7	29.1	8.4	9.4	10	318
40 / 580	57.9	60.5	22.9	24.7	29.5	463	25.9	28.8	11.3	12.2	15	362
50 / 725	57.1	60.2	28.3	30.3	40	626	25.1	28.3	13.9	15.2	20	430
60 / 870	56.3	59.7	33.8	36.1	40	626	24.3	27.7	16.6	18.0	20	430
70 / 1015	55.5	59.2	39.2	41.7	50	690	23.5	27.5	19.3	20.8	25	445
80 / 1160	54.7	58.9	44.5	47.5	50	690	22.7	26.9	22.0	23.7	25	445
90 / 1305	53.9	58.4	49.9	53.1	60	933	21.9	26.7	24.7	26.6	29.5	478
100 / 1450	53.4	58.1	55.4	58.7	60	933	21.1	26.2	27.5	29.4	40	624
110 / 1595	52.6	57.9	60.7	64.5	74	1153	–	–	–	–	–	–
120 / 1740	51.8	57.3	66.1	70.1	74	1153	–	–	–	–	–	–
<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	335	38.8	41.0	4.0	4.7	7.4	251
20 / 290	80.8	83.5	16.0	17.3	20	357	37.8	40.2	7.6	8.6	10	318
30 / 435	79.8	82.7	23.2	24.9	29.5	463	36.7	39.6	11.4	12.5	15	362
40 / 580	78.7	82.2	30.6	32.7	40	626	35.7	39.1	15.0	16.4	20	430
50 / 725	77.7	81.6	37.8	40.5	50	690	34.6	38.6	18.6	20.2	25	445
60 / 870	76.9	81.1	45.2	48.3	60	933	33.6	38.0	22.3	24.1	25	445
70 / 1015	75.8	80.6	52.4	55.9	60	933	32.8	37.5	25.9	28.0	29.5	478
80 / 1160	75.0	80.1	59.7	63.7	74	1153	31.7	37.0	29.6	32.1	40	624
90 / 1305	74.0	79.8	67.1	71.5	74	1153	30.6	36.5	33.3	35.9	40	624
100 / 1450	73.2	79.3	74.3	79.3	101	1385	29.9	36.2	36.9	39.8	50	811
110 / 1595	72.1	79.0	81.7	86.9	101	1385	–	–	–	–	–	–
120 / 1740	71.3	78.5	88.9	94.7	101	1385	–	–	–	–	–	–

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

Viscosity > 90 SSU more power consumption.

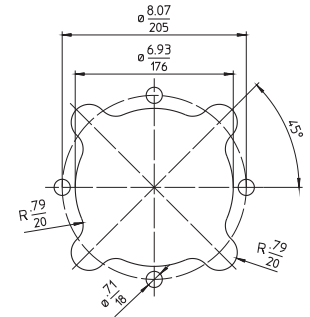
# Characteristics and dimensions

## TFS5, FFS5

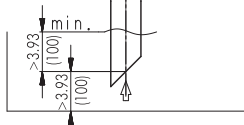
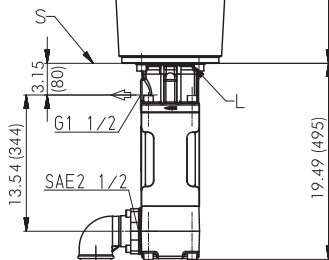
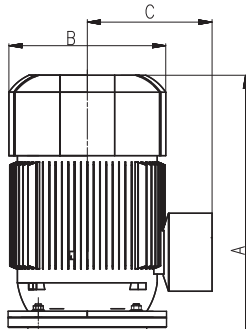
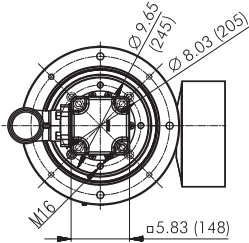
50 Hz

### Mounting hole patterns

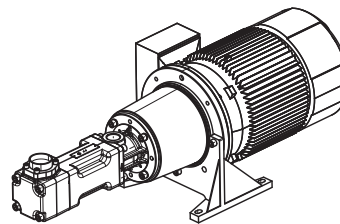
TFS5



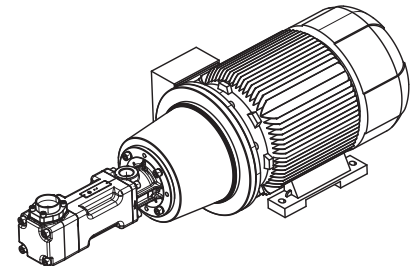
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



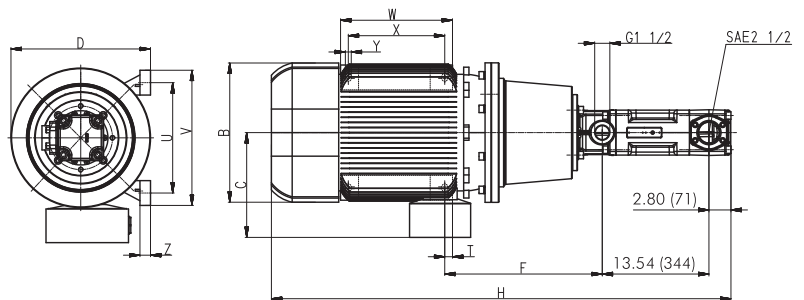
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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
–	5.4	21.89	8.74	6.97	11.02	8.98	41.38	0.89	8.46	9.84	9.06	7.28	0.55	0.59
–	7.4	24.49	10.31	7.95	13.19	8.74	43.98	0.89	10.43	11.81	10.63	8.86	0.55	0.71
10	10	26.81	10.31	7.95	13.19	8.74	46.30	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.59	12.36	9.33	16.14	9.33	50.08	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	20	32.95	12.36	9.33	16.14	9.33	52.44	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	–	32.56	12.36	9.33	16.14	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	16.14	9.33	52.20	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29.5	–	32.56	14.02	11.26	16.14	9.33	52.05	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	29.5	33.90	14.02	11.26	16.14	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	18.11	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	18.11	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	20.47	8.78	56.06	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	–	38.86	17.68	13.31	17.72	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
74	–	41.69	19.57	16.14	20.67	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
101	–	44.57	21.69	17.05	21.85	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.	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>TFS5120/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 103.5</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 51.8</b>		–	–	–	–
10 / 145	98.3	100.9	10.1	11.7	15	335	46.5	49.1	4.8	5.5	7.4	251
20 / 290	96.7	100.1	18.9	20.9	25	404	45.2	48.3	9.1	10.2	15	362
30 / 435	95.4	99.3	27.6	30.2	40	626	43.6	47.6	13.5	14.9	20	430
40 / 580	93.8	98.5	36.3	39.6	50	690	42.3	46.8	18.0	19.6	25	445
50 / 725	92.5	97.8	45.2	48.8	60	933	40.7	46.2	22.3	24.3	29.5	478
60 / 870	91.1	97.2	53.9	58.1	60	933	39.4	45.4	26.7	29.0	29.5	478
70 / 1015	89.8	96.7	62.6	67.3	74	1153	38.0	44.9	31.1	33.7	40	624
80 / 1160	88.8	96.2	71.3	76.6	101	1385	37.0	44.4	35.4	38.4	40	624
90 / 1305	87.5	95.6	80.2	85.8	101	1385	35.4	43.9	39.8	43.0	50	811
100 / 1450	86.4	95.1	88.9	95.2	101	1385	34.1	43.3	44.3	47.7	50	811
110 / 1595	85.1	94.6	97.6	104.5	121	1660	–	–	–	–	–	–
120 / 1740	84.0	94.3	106.5	113.7	121	1660	–	–	–	–	–	–
<b>TFS5130/</b>	<b>Q<sub>Th</sub><sup>1)</sup> 112.2</b>		–	–	–	–	<b>Q<sub>Th</sub><sup>1)</sup> 56.1</b>		–	–	–	–
10 / 145	106.5	108.9	10.9	12.3	20	357	50.5	52.6	5.1	5.8	7.4	251
20 / 290	104.6	107.5	20.2	22.1	25	404	48.6	51.5	9.9	10.7	15	362
30 / 435	102.8	106.2	29.8	31.8	40	626	46.8	50.2	14.6	15.7	20	430
40 / 580	101.2	105.2	39.3	41.6	50	690	45.2	49.1	19.3	20.5	25	445
50 / 725	99.6	104.1	48.8	51.4	60	933	43.6	47.8	24.1	25.5	29.5	478
60 / 870	98.0	103.0	58.2	61.2	74	1153	42.0	46.8	28.8	30.4	40	624
70 / 1015	96.7	102.0	67.7	70.8	74	1153	40.7	46.0	33.7	35.4	40	624
80 / 1160	95.4	100.9	77.2	80.6	101	1385	39.4	44.9	38.4	40.2	50	811
90 / 1305	94.3	100.1	86.8	90.4	101	1385	37.8	43.9	43.0	45.2	50	811
100 / 1450	93.0	99.1	96.2	100.2	121	1660	36.5	43.1	47.9	50.2	60	922
110 / 1595	91.7	98.3	105.7	109.8	121	1660	–	–	–	–	–	–
120 / 1740	90.6	97.5	115.2	119.6	147	1980	–	–	–	–	–	–

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

Viscosity > 90 SSU more power consumption.



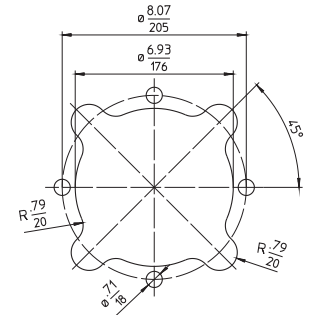
# Characteristics and dimensions

## TFS5, FFS5

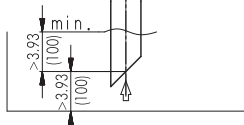
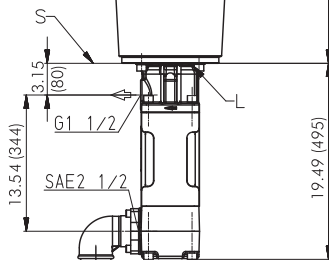
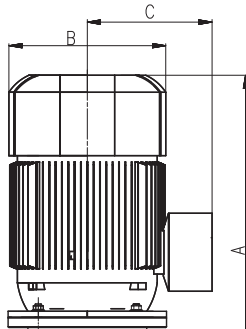
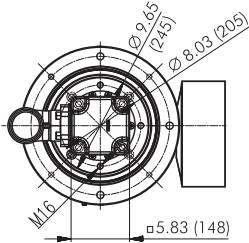
50 Hz

### Mounting hole patterns

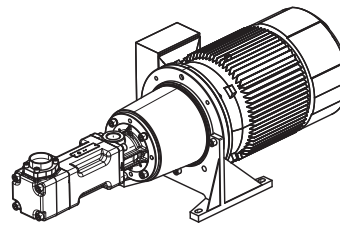
TFS5



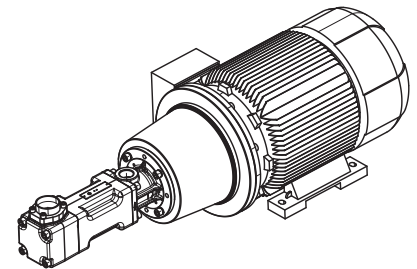
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



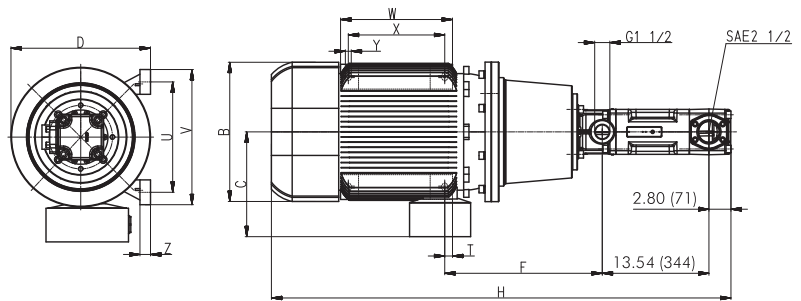
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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
-	7.4	24.49	10.31	7.95	13.19	8.74	43.98	0.89	10.43	11.81	10.63	8.86	0.55	0.71
15 / 20	15	30.59	12.36	9.33	16.14	9.33	50.08	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	20	32.95	12.36	9.33	16.14	9.33	52.44	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	-	32.56	12.36	9.33	16.14	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	16.14	9.33	52.20	0.79	11.81	13.78	12.01	10.43	0.71	0.71
-	29.5	33.90	14.02	11.26	16.14	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	18.11	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	18.11	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	20.47	8.78	56.06	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	60	38.86	17.68	13.31	17.72	20.00	58.35	0.98	14.02	17.17	14.21	12.24	0.75	1.34
74	-	41.69	19.57	16.14	20.67	22.05	61.18	1.18	15.98	19.29	16.10	13.74	0.94	1.57
101	-	44.57	21.69	17.05	21.85	22.91	64.05	2.19	17.99	21.26	18.86	14.49	0.94	1.57
121	-	48.94	21.69	17.05	21.85	22.91	68.43	1.18	17.99	21.26	18.86	16.50	0.94	1.57
147	-	48.78	24.25	20.28	25.39	24.53	68.27	1.38	20.00	24.72	20.75	17.99	1.38	2.05

# 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	490	57.1	58.1	5.9	6.8	10	452
20 / 290	115.5	117.6	22.9	25.2	29.5	595	54.7	57.1	11.1	12.1	15	494
30 / 435	113.3	116.2	33.3	35.5	40	759	52.6	55.7	16.2	17.2	20	562
40 / 580	111.2	115.2	43.4	45.7	50	822	50.5	54.4	21.3	22.3	25	578
50 / 725	109.4	114.1	53.8	56.1	60	1067	48.6	53.4	26.4	27.4	29.5	611
60 / 870	107.5	113.1	64.0	66.2	74	1288	46.8	52.3	31.6	32.6	40	756
70 / 1015	105.9	112.0	74.3	76.6	101	1519	45.2	51.3	36.7	37.7	40	756
80 / 1160	104.4	111.0	84.5	86.8	101	1519	43.6	50.2	41.8	42.8	50	946
<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	536	76.1	77.7	7.6	8.6	10	452
20 / 290	154.3	156.9	29.8	32.1	40	759	73.4	76.1	14.5	15.4	20	562
30 / 435	151.7	155.3	43.4	45.7	50	822	70.8	74.5	21.3	22.3	25	578
40 / 580	149.3	154.0	57.1	59.4	74	1288	68.4	73.2	28.2	29.1	40	756
50 / 725	147.2	152.7	70.8	73.1	101	1519	66.3	71.9	35.0	35.9	40	756
60 / 870	145.0	151.4	84.5	86.8	101	1519	64.2	70.5	41.8	42.8	50	946
70 / 1015	143.2	150.1	98.2	100.4	121	1795	62.4	69.2	48.7	49.6	60	1056
80 / 1160	140.8	148.7	111.8	114.1	121	1795	60.0	67.9	55.5	56.5	60	1056
<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	29.5	595	91.9	93.8	9.1	10.1	15	494
20 / 290	186.0	188.9	35.5	37.8	50	822	88.2	91.1	17.3	18.2	20	562
30 / 435	182.8	186.5	52.0	54.3	60	1067	85.1	89.0	25.6	26.6	29.5	611
40 / 580	179.7	184.4	68.5	70.8	74	1288	81.9	86.7	33.9	34.9	40	756
50 / 725	176.7	182.6	85.0	87.3	101	1519	79.0	84.8	42.1	43.0	50	946
60 / 870	173.8	180.7	101.6	103.9	121	1795	76.1	83.0	50.4	51.4	60	1056
70 / 1015	170.7	178.6	118.1	120.4	147	2115	72.9	80.8	58.7	59.7	74	1244
80 / 1160	167.8	176.5	134.6	136.9	147	2115	70.0	78.7	66.9	67.9	74	1244

<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.

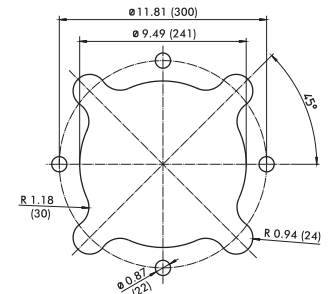
# Characteristics and dimensions

## TFS6, FFS6

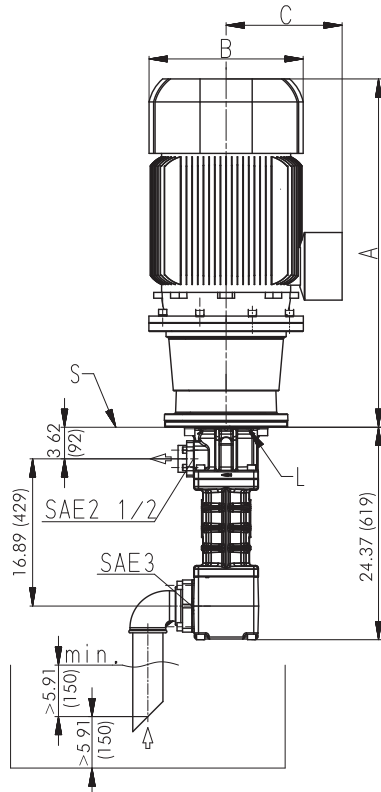
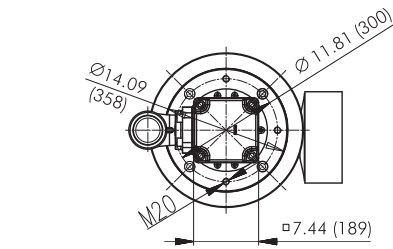
### 50 Hz

#### Mounting hole patterns

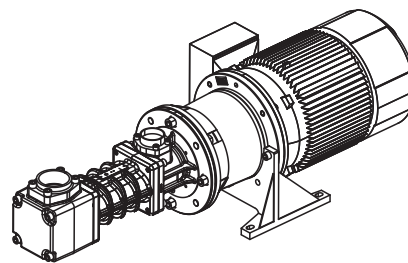
#### TFS6



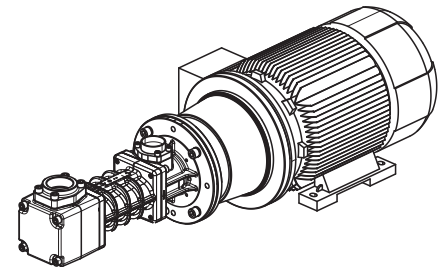
Dimensions in Inches / mm  
All corners must be deburred!  
According to ISO 2768-m



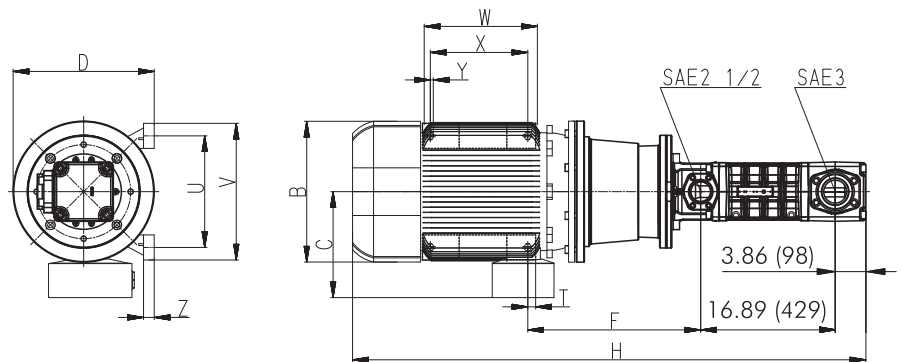
L = Leakage hole  
S = Mounting plate, please refer to the cut-out of mounting hole



< 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	28.46	10.31	7.95	13.19	9.92	53.19	0.89	10.43	11.81	10.63	8.86	0.55	0.71
20	15	31.69	12.36	9.33	16.14	9.92	56.06	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	20	34.06	12.36	9.33	16.14	10.43	58.43	0.79	11.81	13.78	12.01	10.43	0.71	0.71
25	–	33.66	12.36	9.33	16.14	9.92	58.03	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	25	33.82	14.02	11.26	16.14	10.43	58.19	0.79	11.81	13.78	12.01	10.43	0.71	0.71
29.5	–	33.66	14.02	11.26	16.14	9.92	58.03	0.79	11.81	13.78	12.01	10.43	0.71	0.71
–	29.5	35.00	14.02	11.26	16.14	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	18.11	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	18.11	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	18.11	10.43	61.18	0.98	13.78	15.75	13.78	11.81	0.71	0.79
–	50	38.39	17.68	13.31	20.47	17.01	62.76	0.98	15.75	17.72	15.16	13.19	0.71	0.79
60	60	39.88	17.68	13.31	17.72	21.50	64.25	0.98	14.02	17.17	14.21	12.24	0.75	1.34
74	–	42.20	19.57	16.14	20.67	23.03	66.57	1.18	15.98	19.29	16.10	13.74	0.94	1.57
101	–	45.67	21.69	17.05	21.85	24.49	70.04	2.19	17.99	21.26	18.86	14.49	0.94	1.57
121	–	46.10	21.69	17.05	21.85	24.49	74.41	1.18	17.99	21.26	18.86	16.50	0.94	1.57

## 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.

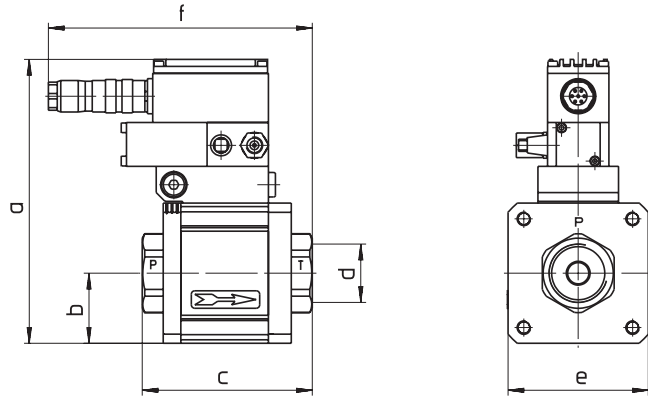
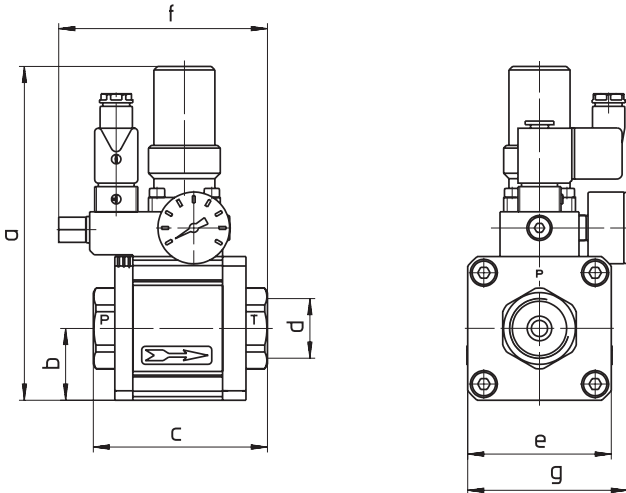
The system user must ensure that the operating pressure never exceeds the highest allowable operating pressure (i.e. by using a second non adjustable pressure relief valve which is set for the highest allowable pressure).

#### 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	-	-

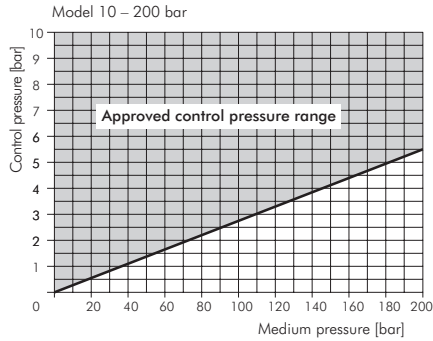
Type SPB	a Inch	b Inch	c Inch	d Inch	e Inch	f Inch
08	5.95	1.46	5.43	G <sup>3</sup> / <sub>8</sub>	∅ 2.91	-
S / H 15	6.38	1.57	3.82	G1	∅ 3.15	5.93
S / H 32	7.58	2.36	6.30	G1 <sup>1</sup> / <sub>2</sub>	∅ 4.72	6.95
S 50	9.88	2.76	6.30	G1 <sup>1</sup> / <sub>2</sub>	∅ 5.51	-

Further valves on request.

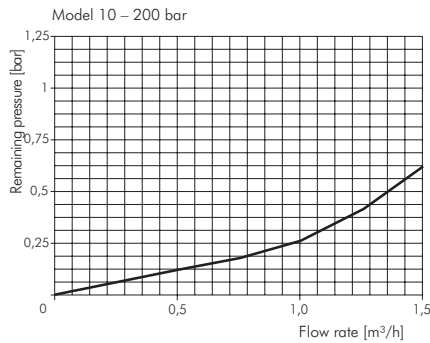
## Valves

### 3-HPB – 08 | SPB – 08

Control pressure diagram

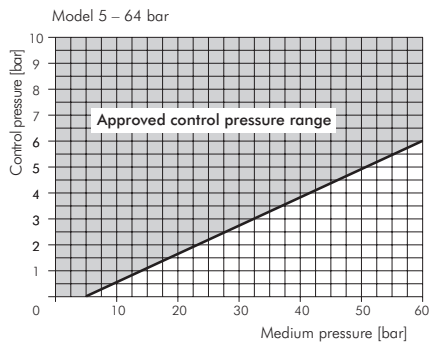


Depressurized recirculation mode

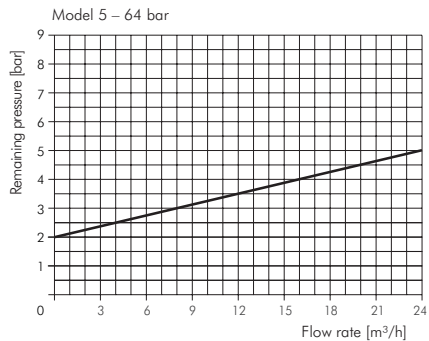


### 3 – HPB – S 32 | SPB – S 32

Control pressure diagram

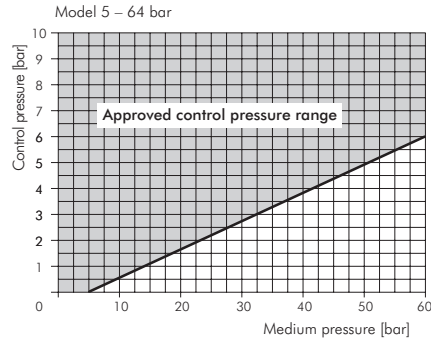


Depressurized recirculation mode

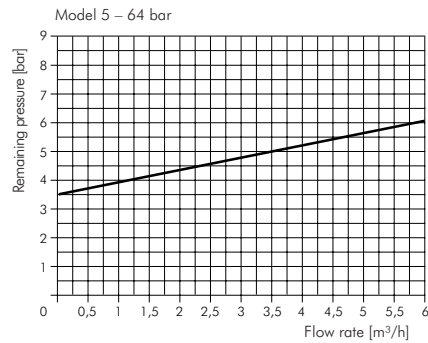


### 3 – HPB – S 15 | SPB – S 15

Control pressure diagram

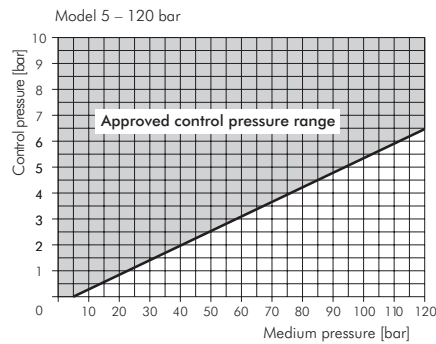


Depressurized recirculation mode

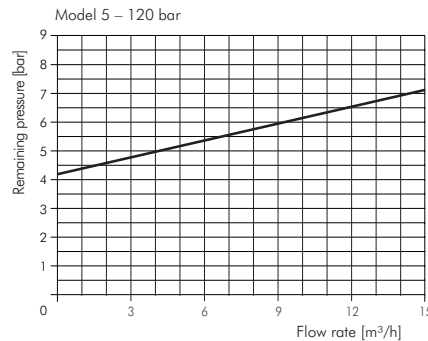


### 3 – HPB – H 32 | SPB – H 32

Control pressure diagram

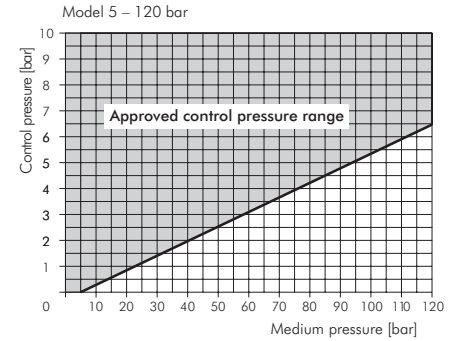


Depressurized recirculation mode

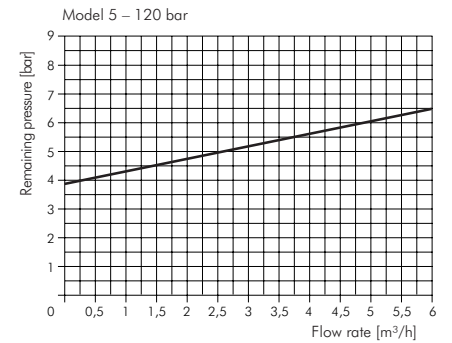


### 3 – HPB – H 15 | SPB – H 15

Control pressure diagram

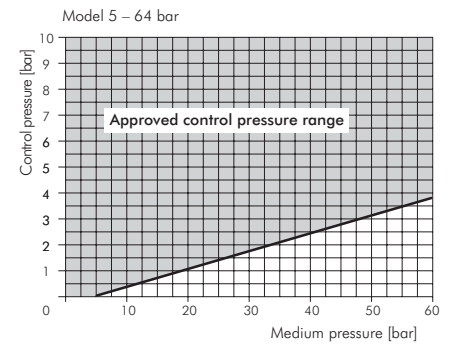


Depressurized recirculation mode

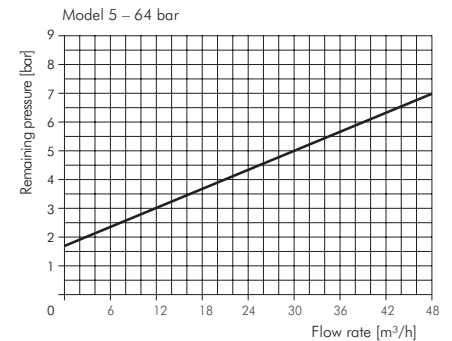


### 3 – HPB – S 50 | SPB – S 50

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 cushions against vibration is recommended. BBV 1 – 3 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.

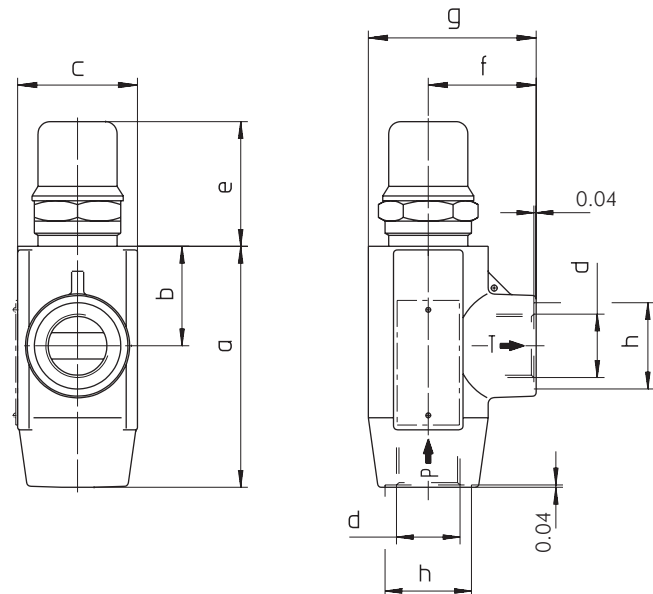
### Non-adjustable Pressure Relief Valves BBV

Non-adjustable Pressure Relief valves of the series BBV are shock absorbent valves which open at a preset pressure. The relief valve opens at the factory set pressure which is available in 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	BBV 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BFS2, FFS2	BBV 2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
TFS2, FFS3	BBV 3	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Ordering description: e.g. BBV 3 / 50

	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



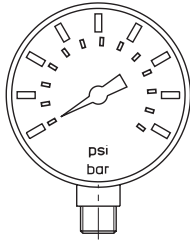
Dimensions in Inches

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

Above mentioned pressure relief valves are available upon request in a adjustable version. The system user must ensure that the operating pressure never exceeds the highest allowable operating pressure (i.e. by using a second non adjustable pressure relief valve which is set for the highest allowable pressure).

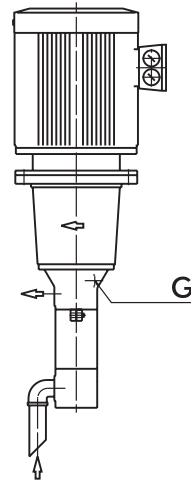
## Pressure gauge / Suction protection G4 Version

### Pressure gauge



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

### G4 Version

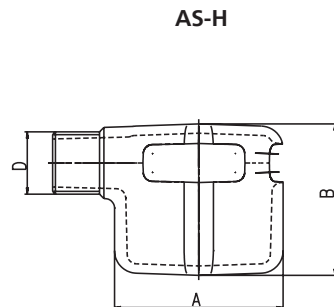
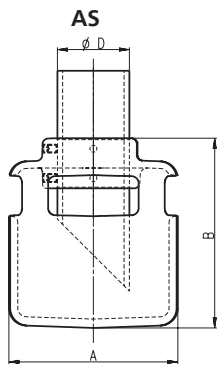


G1/8 BFS/FFS 1, 2  
G1/4 TFS/FFS 3, 4, 5

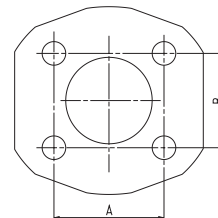
Depressurized leakage return to tank

### Suction protection

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



### SAE flange

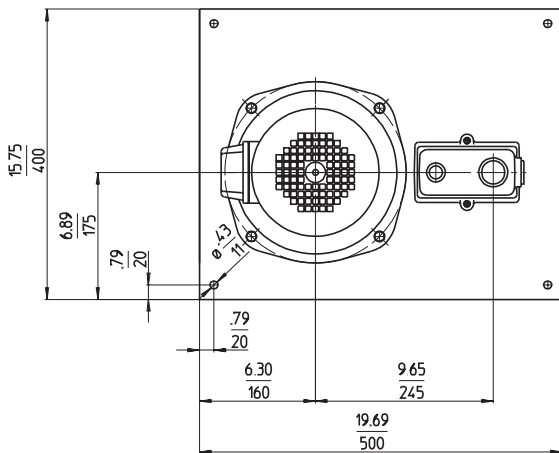
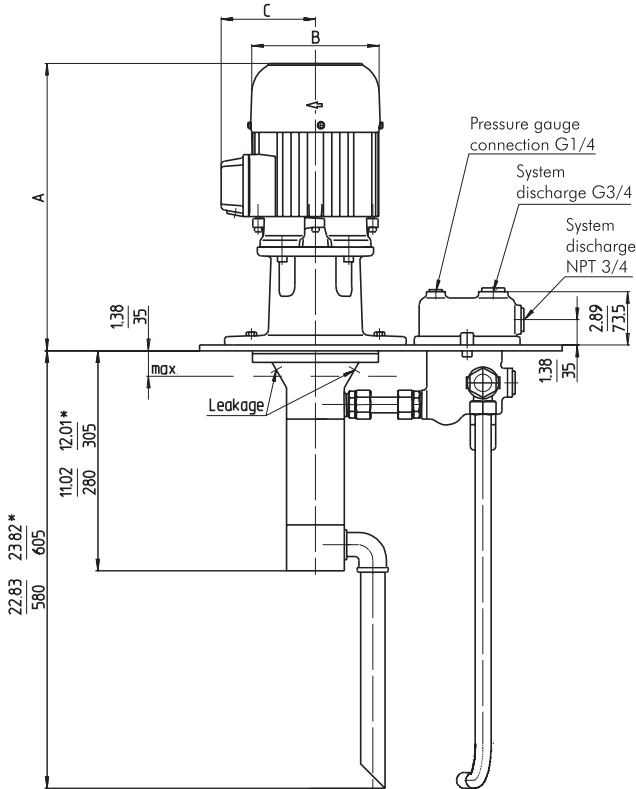


Type	Type of Pumps	A Inch	B Inch	Ø D
AS1-2	BFS1, BFS2	3.54	3.70	1"
AS3	TFS3	4.53	5.08	1½"
AS4	TFS4	5.91	6.89	2"
AS5	TFS5	7.68	7.48	2½"
AS1-2-H	BFS1, BFS2	3.54	3.15	1"
AS3H	TFS3	4.53	4.53	G1½
AS4H	TFS4	6.02	6.89	G2
AS5H	TFS5	7.64	7.48	G2½

Type	Type of Pumps	A Inch	B Inch
SAE 2 ½	TFS5, FFS5	3.50	2.00
SAE 3	TFS6, FFS6	4.75	2.75

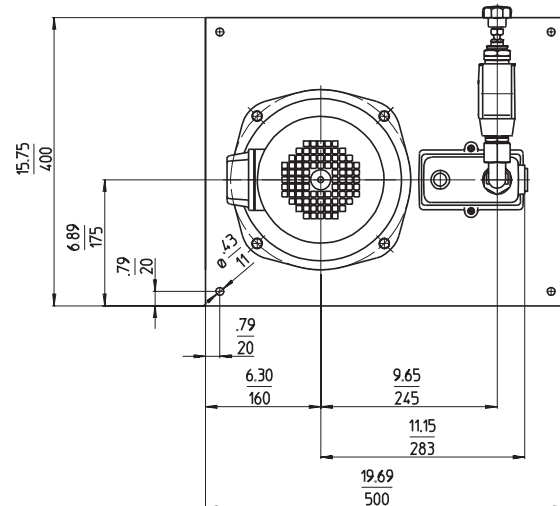
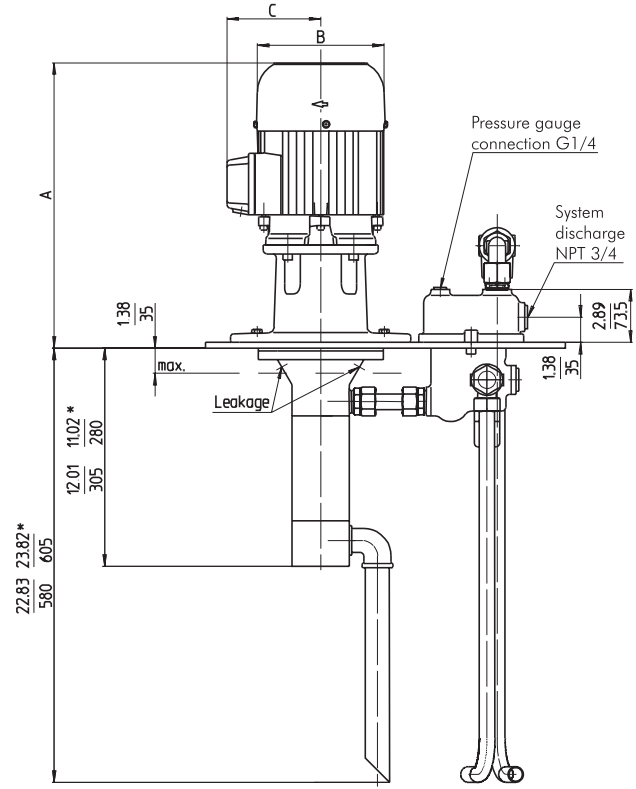
## Pump system, fully assembled

1. 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

2. 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

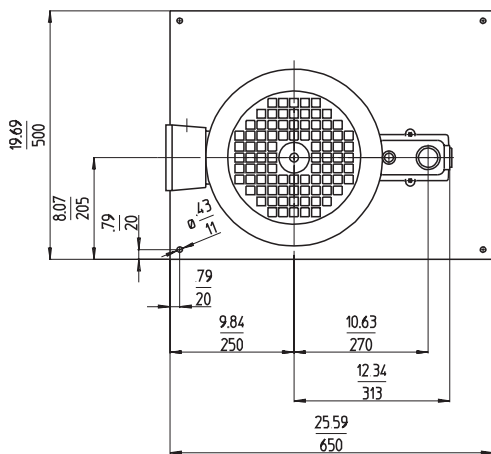
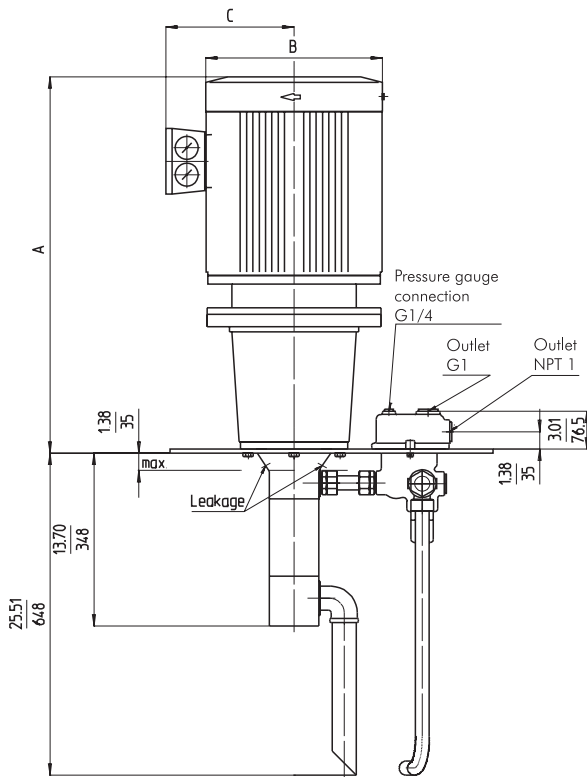
\*) Dimensions for BFS2  
Dimensions A + 0.31 Inch (8 mm) mounting plate

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



## Pump system, fully assembled

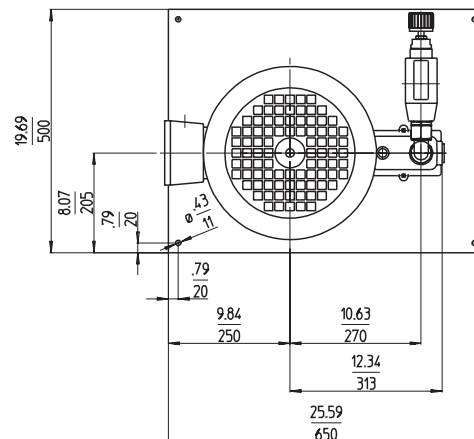
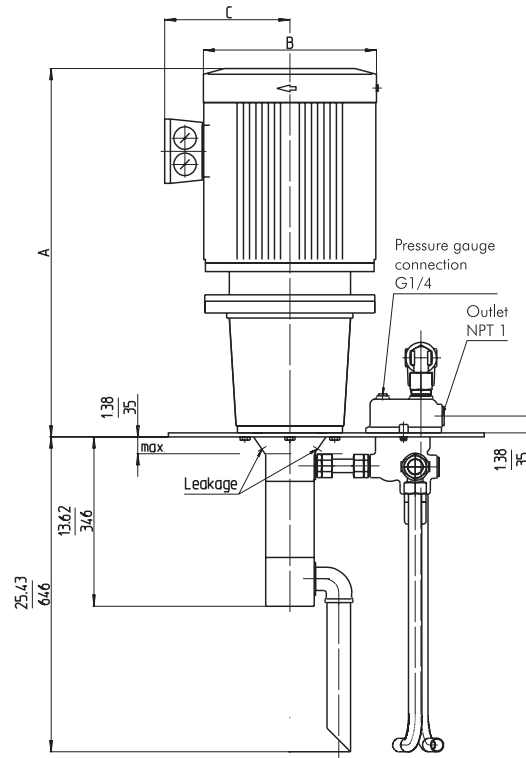
- Series TFS3, non adjustable pressure relief valve:  
Screw pump with mounting plate, integrated connection block and piping fully assembled.  
The non-adjustable pressure relief valve is integrated into the connection block.



Dimensions in Inches / mm

Dimensions A + 0.31 Inch (8 mm) mounting plate

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



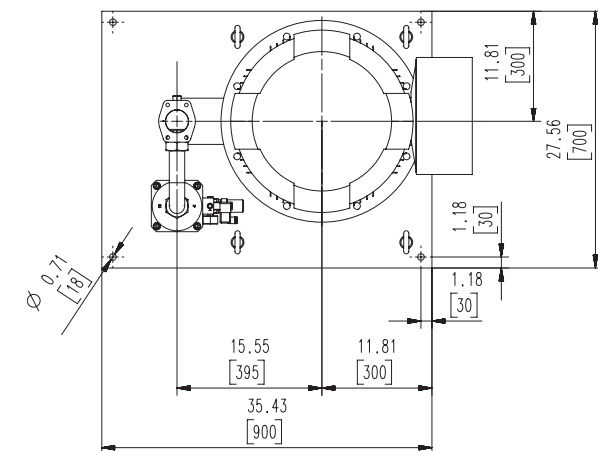
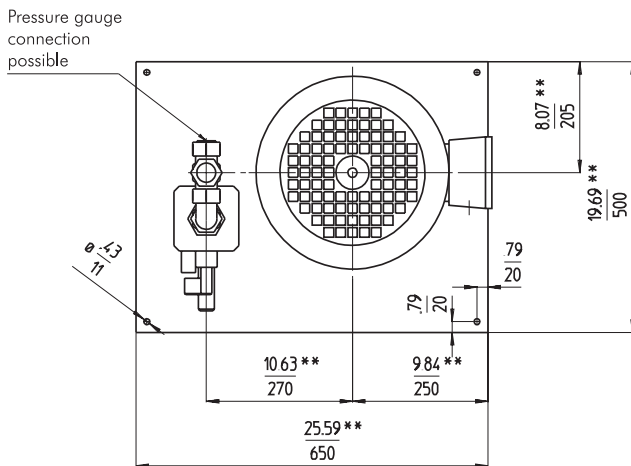
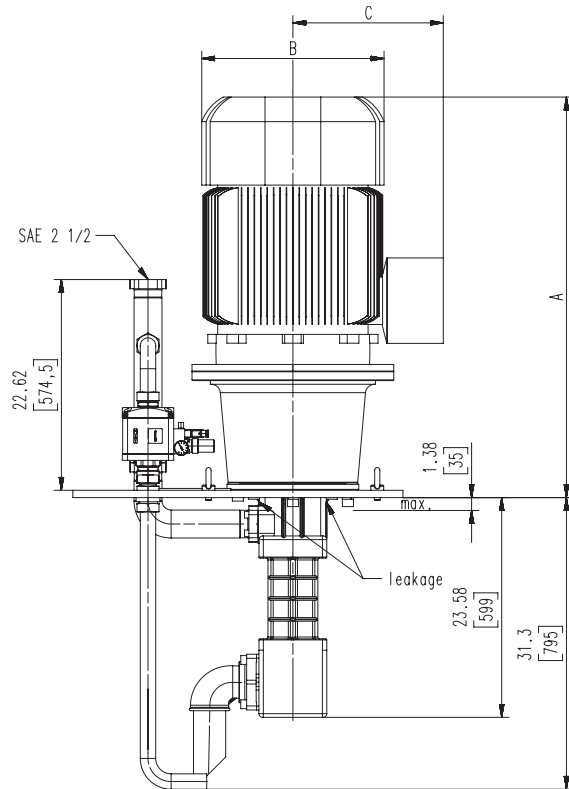
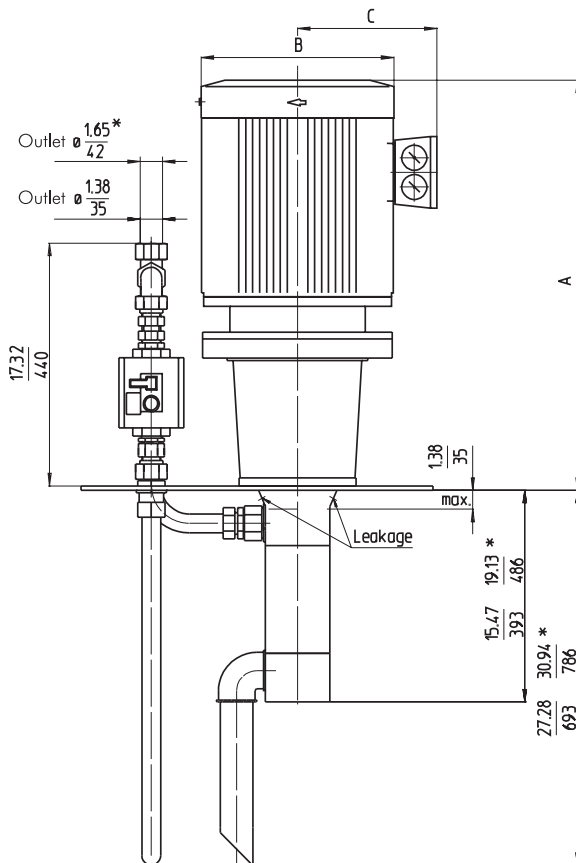
Dimensions in Inches / mm

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

# 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"/> 1 x 115 V, 60 Hz
	<input type="checkbox"/> 3 x 200 V, 50 Hz	<input type="checkbox"/> 3 x 380 V, 60 Hz	<input type="checkbox"/> other:
	<input type="checkbox"/> 1 x 230 V, 50 Hz	<input type="checkbox"/> 3 x 400 V, 60 Hz	

Motor	
Protective system IP55	
Insulation class (F)	
Ambient temperature (°F / °C)	
Variable frequency drive (Hz)	from      to
On/Off cycles (per min)	
Motor connection plug HAN	<input type="checkbox"/> yes
Motor efficiency class	<input type="checkbox"/> IE2 <input type="checkbox"/> IE3

Other