



brainpower your pumps!



**SCREW SPINDLE PUMPS 2019
PRODUCT SUPPLEMENT
160 – 200 bar**

CONTROL, OPTIMIZE, DIGITALIZE.

Industry 4.0 in perfection: Utilizing bpllogic pump control allows to intelligently integrate BRINKMANN PUMPS' know-how between machine tools, pumps, filtration systems and other components.

bpllogic adapts perfectly to the existing sytem environment – no matter which variable frequency drives are used.



brainpower your pumps!

bpllogic

DEVICE FEATURES

CONNECTIVITY

BASIC APPLICATIONS



MONITORING

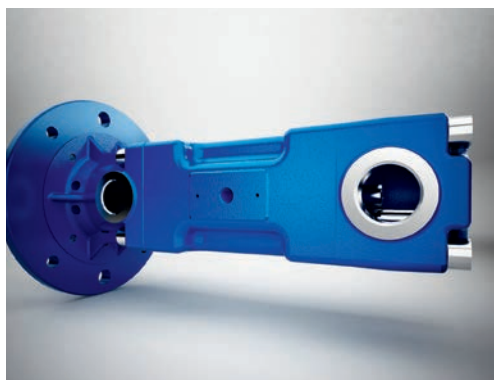
PREDICTIVE MAINTENANCE

SOFT SENSORS

ADVANCED APPLICATIONS



Additional information can be found under:
bpllogic.brinkmannpumps.de



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High Pressure Pumps	Screw spindles	50 Hz
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High Pressure Pumps BFS1, 50 Hz	Screw spindles High pressure 7.4 ... 12.8 l/min 160 ... 200 bar	10
High Pressure Pumps BFS2, 50 Hz	Screw spindles High pressure 10.8 ... 33.1 l/min 160 ... 200 bar	12



High Pressure Pumps	Screw spindles	60 Hz
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High Pressure Pumps BFS1, 60 Hz	Screw spindles High pressure 10.6 ... 17.1 l/min 160 ... 200 bar	11
High Pressure Pumps BFS2, 60 Hz	Screw spindles High pressure 16.2 ... 41.5 l/min 160 ... 200 bar	13



Electrical Features

Motors acc. to EN 60034-1

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

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

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

Special voltages are available upon request:

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

● available – not available

Other voltages upon request.

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

Motors as of 6 kW

Motors are Δ connected. The motor design allows Υ/Δ -starting, if required.
Screw-spindle pumps used for Υ/Δ -starting must be started without pressure.
Soft-starting devices are a recommendable alternative to Υ/Δ -starting.



Technical motor data IE3

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

Brinkmann motors

	Power 50 Hz / 60 Hz kW	Current 2 pole 50 Hz A		Noise level max. dBA / 50 Hz	Current 2 pole 60 Hz A		Noise level max. dBA / 60 Hz
		Y 380 V – 415 V	Δ 380 V – 415 V		Y 460 V	Δ 460 V	
		IE3	B 5.0 / 5.75		10.0 – 9.65	–	
	B 5.5 / 6.3	10.9 – 10.4	–	74	10.4	–	77
	B 6.0 / 6.9	–	11.2 – 10.6	74	–	10.7	77
	B 6.5 / 7.48	–	12.0 – 11.3	74	–	11.5	77
	B 7.5 / 8.6	–	14.3 – 13.4	74	–	13.7	77
	B 9.0 / 10.3	–	16.7 – 15.6	74	–	15.8	78
	B 11.0 / 12.6	–	20.1 – 18.8	75	–	19.5	80
	B 13.0 / 15.0	–	24.2 – 23.5	77	–	23.6	80

Standard motors

	Power 50 Hz / 60 Hz kW	Current 2 pole 50 Hz A	Noise level dBA / 50 Hz	Current 2 pole 60 Hz A	Noise level dBA / 60 Hz
		Δ 400 V		Δ 460 V	
		IE3		15.0 / 17.3	
	18.5 / 21.3	32.0	75	32.0	80

Noise level with +3 dBA tolerance for standard motors.

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

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

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

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

Materials of construction

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

Standard design	Model Index	Immersion Style	
		BFS1	BFS2
Version			
Highly wear resistant SIC-bushing around labyrinth seal, specially coated driving male spindle and outer female spindles	-KBT5N	●	●
Axial thrust compensation through radial slide bushing inside the suction cover	-A	●	●
Installation – vertical; Mechanical seal and external leakage return; positive suction pressure of up to 7 bar	-G	●	●

Order code for vertical installation (without footmount bracket): e.g. TFS250/200-GEP2

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.

Operation requirements up to 200 bar

- **Standard type:** GE-P2
- **No grinding applications** or applications with very abrasive particles
- **Coolant concentration:**
 - ≥ 4% for coolants with oil contents or a proven good lubricity
 - ≥ 8% for synthetic coolants with minimum lubricity according to our factory standard
- **Temperature verification:**

As a standard there is a temperature verification needed for the following cases ($T_{max} = 60^{\circ}C$) and also available as accessory:

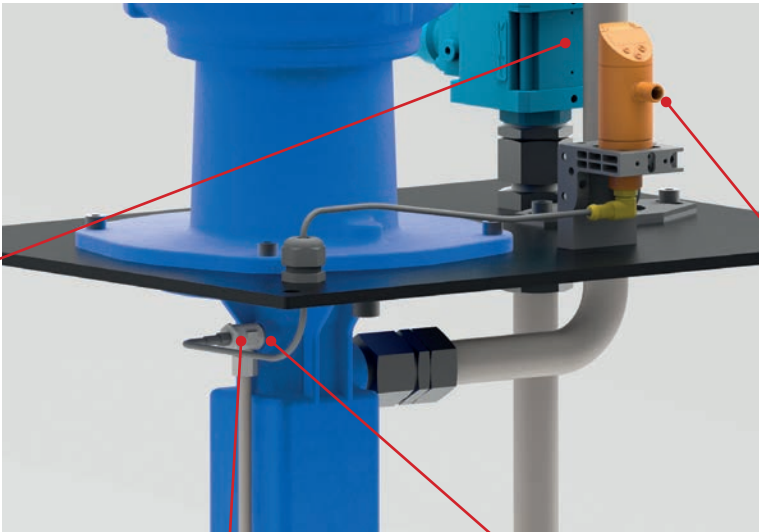
 - All oil applications
 - Size 1: Applications with emulsion for more than 3000 rpm
 - Size 2: Applications with emulsion for more than 1500 rpm
 - Alternatively it is possible to guarantee a specific minimum flow rate by the application set-up. In this case all details of the operation and the customers facility must be known.
- **Filtration:** max. 10 μm , 20 ppm according to a measurement with our factory standard
- **Guarantee:**
 - 2 years on manufacturing faults
 - Operation related wear excluded
 - Life time expectation of spindle set: about 40 % compared to standard applications up to 120 bar
- **Start and Stop** against reduced pressure (max. 10 bar), not against 200 bar
- **Air content** < 3% vol., no big bubbles
- **Start-up** only by qualified staff. Start-up failures lead to damages quicker for 200 bar.

Models and Applications for High Pressure Screw Pumps

Example of a high pressure unit with temperature monitoring



Pressure limiting valve
160–200 bar



Temperature evaluation unit

Temperature sensor

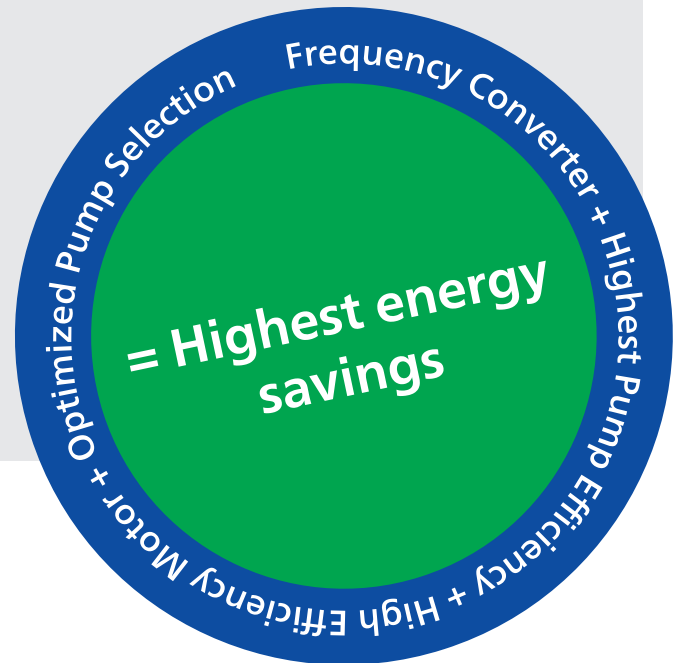
Connection G $\frac{1}{8}$ "

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

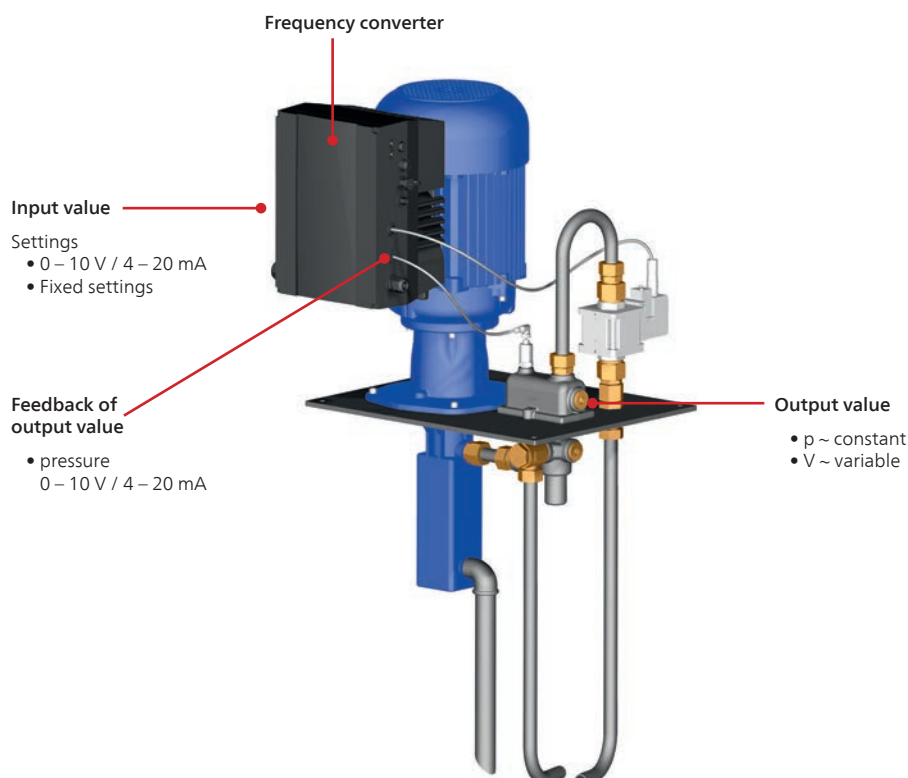
For detailed information please do not hesitate to contact us.



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.

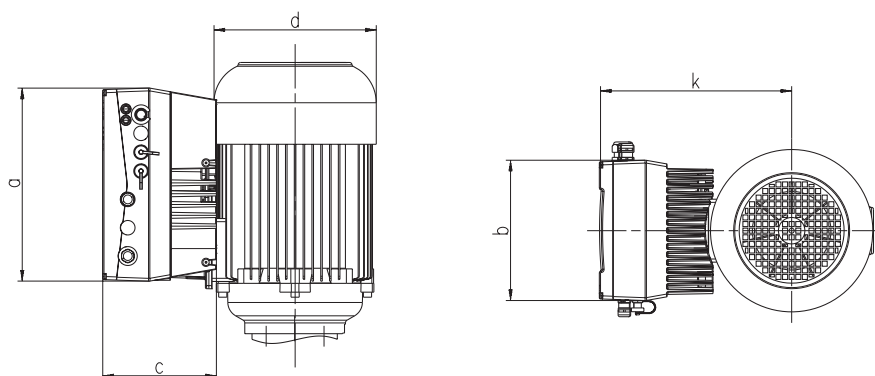


Control / Regulation

TECHNICAL DATA Frequency converter FKO (1.5 – 22 kW)

Function	Specification
Rated voltage	3 AC 380 V -10 % ... 480 V +10 %
Rated frequency	50/60 Hz ± 6 %
Output ranges	... 1.5 kW 2.2 – 4 kW 5.5 – 7.5 kW 11 – 22 kW
Housing size	A B C D
Protective system	IP 65 IP 55
EMV approvals acc. to EN61800-3US	C2
Temperature range	-10 °C ... +50 °C
Overload capability	1.5 times rated output current
Protective functions	undervoltage, overvoltage, I ² t-restriction, short circuit, motor temperature, converter temperature, anti-tilt protection
Output frequency range	according to layout at factory
Digital inputs	4
Fixed frequencies	7
Digital outputs	2
Analog inputs	2 analog inputs (0/2 – 10 V, 0/4 – 20 mA)
Analog outputs	0 – 10 V (-I _{max} = 10 mA) or 0 – 20 mA (burden R = 500 Ω)
Process control	PID
Relay outputs	2 x NO contacts 250 V AC 2 A
USB interface	USB on plug M12 (RS485/RS232)
Manual control unit (optional)	MMI with cable
Bus modules (optional)	PROFIBUS DP, CANopen, EtherCAT, PROFINET
UL approval	yes

Dimensions with Brinkmann motor



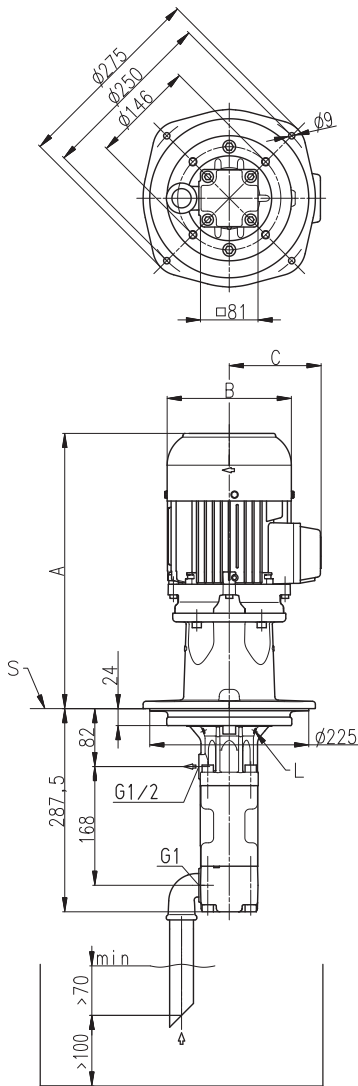
Motor power kW	housing size	a mm	b mm	c mm	d mm	k mm
1.1	A	233	153	120	138	199
1.3 – 1.7	A	233	153	120	176	209
1.9 – 2.6	B	270	189	140	176	223
3.0 – 4.0	B	270	189	140	218	243
5.0 – 5.5	C	307	223	181	218	287
6.0 – 9.0	C	307	223	181	258	306
11.0 – 13.0	D	414	294	233	314	404

High Pressure Pumps

BFS1

50 Hz

Screw spindles



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

Power 2-poles kW	A mm	B mm	C mm
B 5.0 / 5.5	543	218	150
B 6.0	584	258	193
B 7.5 / 9.0	622	258	193

2-pole motor rotation speed 2900 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kg
BFS130/	Q_{Th}¹⁾ 15.6		-	-	-	-
160	-	9.7	-	4.6	B 5.0	63
170	-	9.1	-	4.8	B 5.5	63
180	-	8.5	-	5.1	B 5.5	63
190	-	7.9	-	5.4	B 6.0	87
200	-	7.4	-	5.7	B 6.5	87

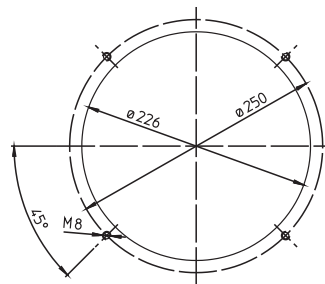
BFS140/	Q_{Th}¹⁾ 20.9		-	-	-	-
160	-	12.8	-	6.1	B 6.5	87
170	-	12	-	6.4	B 7.5	94
180	-	11.2	-	6.8	B 7.5	94
190	-	10.4	-	7.1	B 7.5	94
200	-	9.6	-	7.5	B 9.0	100

¹⁾ Q_{Th}: Theoretical flow rate

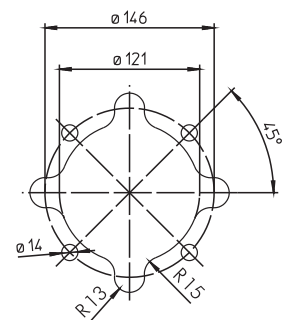
Viscosity > 20 mm²/s more power consumption.

Mounting hole patterns

BFS1 / BFS2



TFS1 / TFS2

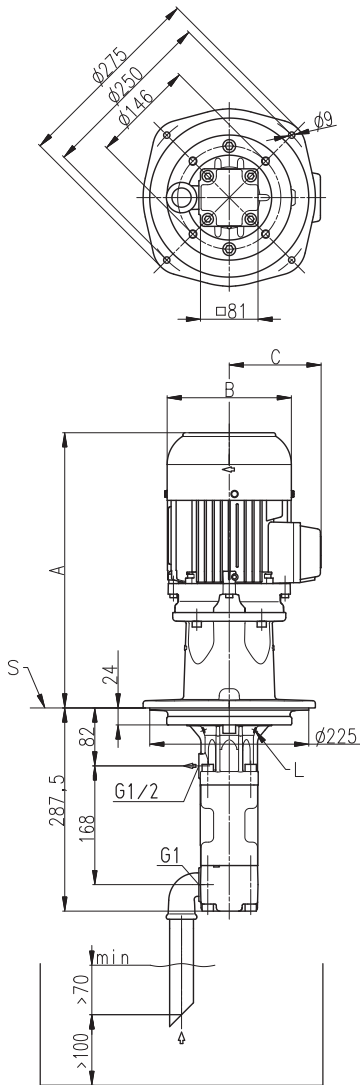


All corners must be deburred!
According to ISO 2768-m

High Pressure Pumps BFS1

60 Hz

Screw spindles



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

Power 2-poles kW	A mm	B mm	C mm
B 5.75 / 6.3	543	218	150
B 6.9 / 7.48	584	258	193
B 8.6 / 10.3	622	258	193

2-pole motor rotation speed 3500 RPM							
Pressure max.	Flow at viscosity		Power consump- tion at viscosity		Motor		Weight IE3
	1 mm^2/s	20 mm^2/s	1 mm^2/s	20 mm^2/s	IE3	NEMA	
Type / bar	l/min	l/min	kW	kW	kW	kW	kg
BFS130/	$Q_{\text{Th}}^{1)}$ 18.8		-	-	-	-	-
160	-	12.9	-	5.5	B 5.75	-	63
170	-	12.3	-	5.9	B 6.3	-	63
180	-	11.7	-	6.2	B 6.9	-	87
190	-	11.2	-	6.5	B 6.9	-	87
200	-	10.6	-	6.9	B 7.48	-	87

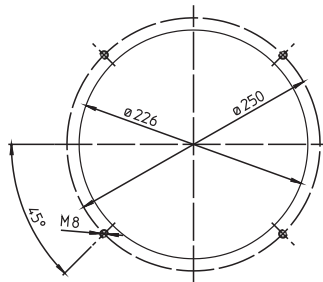
BFS140/	$Q_{\text{Th}}^{1)}$ 25.2		-	-	-	-	-
160	8.4	17.1	7.0	7.3	B 8.6	-	94
170	7.6	16.3	7.4	7.7	B 8.6	-	94
180	7	15.5	7.8	8.2	B 8.6	-	94
190	-	14.7	-	8.6	B 10.3	-	100
200	-	13.9	-	9.1	B 10.3	-	100

¹⁾ Q_{Th} : Theoretical flow rate

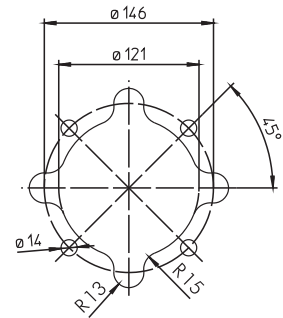
Viscosity > 20 mm^2/s more power consumption.

Mounting hole patterns

BFS1 / BFS2



TFS1 / TFS2



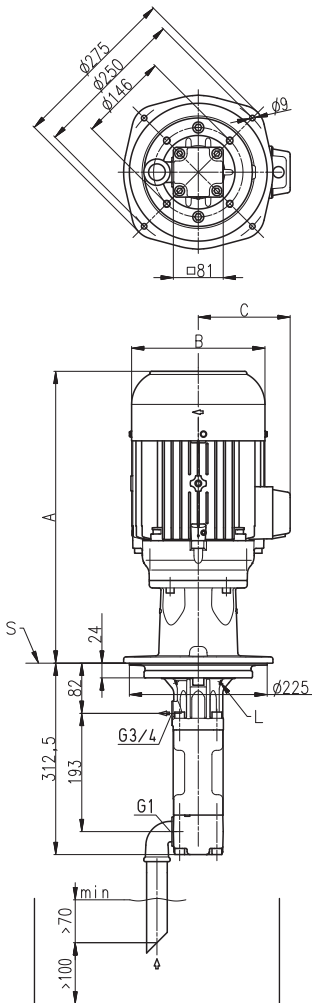
All corners must
be deburred!
According to
ISO 2768-m

High Pressure Pumps

BFS2, FFS2

Screw spindles

50 Hz



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

Power 2-poles kW	A mm	B mm	C mm
B 9.0	622	258	193
B 11.0 / 13.0	630	310	240

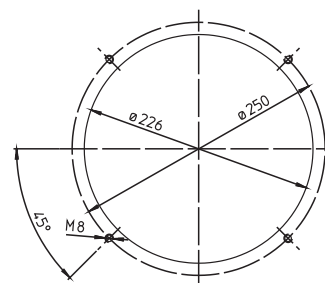
Dimensions for 15 kW standard motor upon request

2-pole motor rotation speed 2900 RPM						
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor	Weight
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s		
Type / bar	l/min	l/min	kW	kW	kW	kg
BFS232/	Q_{Th}¹⁾ 26.1		-	-	-	-
160	15.1	21.1	7.2	7.6	B 9.0	100
170	14	20.4	7.6	8.1	B 9.0	100
180	13	19.7	8.1	8.6	B 9.0	100
190	11.9	18.9	8.5	9.0	B 11.0	122
200	10.8	18.2	8.9	9.5	B 11.0	122
BFS238/	Q_{Th}¹⁾ 31		-	-	-	-
160	17.9	25.3	8.5	9.0	B 11.0	122
170	16.5	24.4	9.0	9.5	B 11.0	122
180	15.2	23.5	9.5	10.1	B 11.0	122
190	13.8	22.7	10.0	10.6	B 13.0	122
200	12.5	21.8	10.6	11.2	B 13.0	122
BFS250/	Q_{Th}¹⁾ 40.8		-	-	-	-
160	22.9	33.1	11.1	11.7	B 13.0	122
170	21.6	31.9	11.8	12.4	B 13.0	122
TFS250/180	20.4	30.7	12.5	13.1	15.0	102
190	19.2	29.4	13.2	13.8	15.0	102
200	18	28.2	13.8	14.5	15.0	122

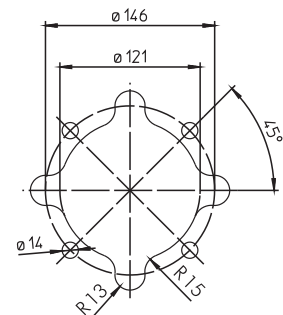
¹⁾ Q_{Th}: Theoretical flow rate
Viscosity > 20 mm²/s more power consumption.

Mounting hole patterns

BFS1 / BFS2



TFS1 / TFS2

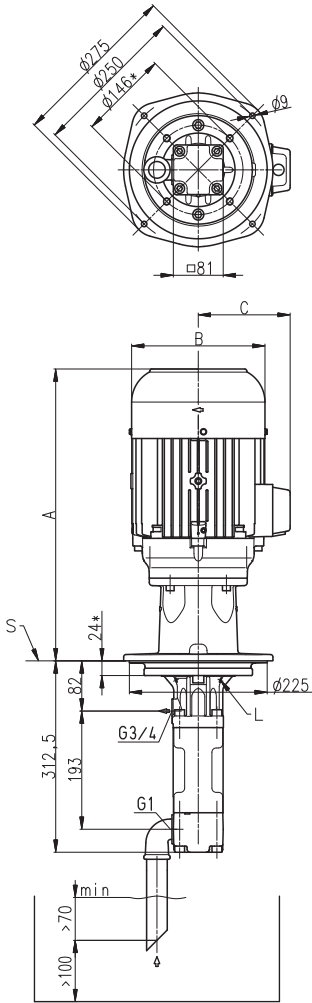


All corners must be deburred!
According to ISO 2768-m

High Pressure Pumps BFS2

60 Hz

Screw spindles



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

Power 2-poles kW	A mm	B mm	C mm
B 10.3	622	258	193
B 12.6 / 15.0	630	310	240

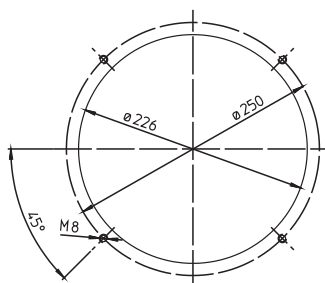
Dimensions for motor upon request

2-pole motor rotation speed 3500 RPM							
Pressure max.	Flow at viscosity		Power consumption at viscosity		Motor		Weight IE3
	1 mm ² /s	20 mm ² /s	1 mm ² /s	20 mm ² /s	IE3	NEMA	
Type / bar	l/min	l/min	kW	kW	kW	kW	kg
BFS232/	Q_{Th}¹⁾ 31.5		-	-	-	-	-
160	20.5	26.5	8.7	9.1	B 10.3	-	100
170	19.4	25.8	9.2	9.7	B 10.3	-	100
180	18.4	25.1	9.8	10.2	B 12.6	-	122
190	17.3	24.3	10.3	10.8	B 12.6	-	122
200	16.2	23.6	10.8	11.3	B 12.6	-	122
BFS238/	Q_{Th}¹⁾ 37.4		-	-	-	-	-
160	24.3	31.7	10.3	10.7	B 12.6	-	122
170	22.9	30.8	10.9	11.4	B 12.6	-	122
180	21.6	30	11.5	12.0	B 12.6	-	122
190	20.2	29.1	12.2	12.7	B 15.0	-	122
200	18.9	28.2	12.8	13.3	B 15.0	-	122
BFS250/	Q_{Th}¹⁾ 49.2		-	-	-	-	-
160	31.3	41.5	13.5	14.0	B 15.0	-	122
TFS250/170	30.1	40.3	14.3	14.9	17.3	-	102
180	28.9	39.1	15.1	15.8	17.3	-	102
190	27.6	37.9	15.9	16.6	17.3	-	102
200	26.4	36.7	16.7	17.5	21.3	-	122

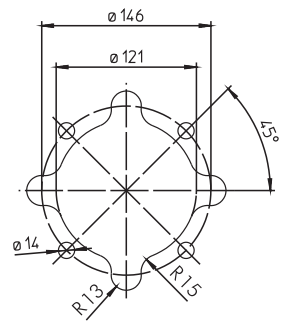
¹⁾ Q_{Th}: Theoretical flow rate
Viscosity > 20 mm²/s more power consumption.

Mounting hole patterns

BFS1 / BFS2



TFS1 / TFS2



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

Questionnaire



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

Contact details	
Company	
Address	
Contact partner	
Telephone	
E-Mail	

Pump	
Requirement per year (each)	

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

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

Dimensions	
Immersion depth	

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

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

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

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

Other	

advance



 expert



 smart



 express



 connect

Service at BRINKMANN PUMPS

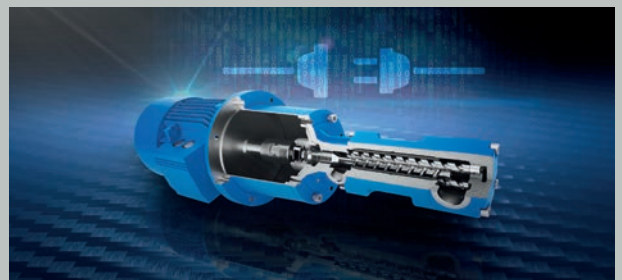
Customer satisfaction is the greatest asset that we as a company can possess. This is why we have developed the „Advance“ service package – which offers customized solutions to satisfy your specific needs. For example, we consult with you and actively support you in determining your actual requirements for a new pump, verifying the application and installation options on site. Then we develop your specific pump followed by subsequent start-up support. But, our range of services does not end here. You will benefit from our very responsive Customer Service Team that will keep you up and running at all times over the live of the pump. In addition you will benefit from a number of additional advantages offered within the BRINKMANN PUMPS Advance program.



EXPERT

The benefits of more know-how

With the BRINKMANN PUMPS expertise and our many years of experience, we do our best to assist you in achieving higher quality results within your operation.



SMART

The benefits of intelligent solutions

BRINKMANN PUMPS provides you with intelligent solutions and a number of benefits that makes purchasing a high-quality pump much easier.



EXPRESS

The benefits of fast service

At BRINKMANN PUMPS, we particularly focus on processing customer requests and orders very quickly.



CONNECT

The benefits of excellent availability

If you expect excellent availability, then you are definitely at the right place at BRINKMANN PUMPS.

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



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

Welcome to BRINKMANN PUMPS.



BRINKMANN PUMPS

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